

1. Dual-Sampling Attention Pooling for Graph Neural Networks on 3D Mesh

Accession number: 20212910663440

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Abstract: Mesh is an essential and effective data representation of a 3D shape. The 3D mesh segmentation is a fundamental task in computer vision and graphics. It has recently been realized through a multi-scale deep learning framework, whose sampling methods are of key significance. Rarely do the previous sampling methods consider the receptive field contour of vertex, leading to loss in scale consistency of the vertex feature. Meanwhile, uniform sampling can ensure the utmost uniformity of the vertex distribution of the sampled mesh. Consequently, to efficiently improve the scale consistency of vertex features, uniform sampling was first used in this study to construct a multi-scale mesh hierarchy. In order to address the issue on uniform sampling, namely, the smoothing effect, vertex clustering sampling was used because it can preserve the geometric structure, especially the edge information. With the merits of these two sampling methods combined, more and complete information on the 3D shape can be acquired. Moreover, we adopted the attention mechanism to better realize the cross-scale shape feature transfer. According to the attention mechanism, shape feature transfer between different scales can be realized by the construction of a novel graph structure. On this basis, we propose dual-sampling attention pooling for graph neural networks on 3D mesh. According to experiments on three datasets, the proposed methods are highly competitive. © 2021 Elsevier B.V.

Number of references: 40

Main heading: Semantics

Controlled terms: Deep learning - Mesh generation - MESH networking

Uncontrolled terms: 3-D shape - 3D meshes - 3d shape semantic segmentation - Attention mechanisms - Deep learning - Dual sampling - Graph convolutional network - Graph neural networks - Sampling method - Uniform sampling

Classification code: 461.4 Ergonomics and Human Factors Engineering - 722 Computer Systems and Equipment - 723.5 Computer Applications - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory

DOI: 10.1016/j.cmpb.2021.106250

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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2. Conversion of Au(III)-polluted waste eggshell into functional CaO/Au nanocatalyst for biodiesel production (Open Access)

Accession number: 20211310155885

Authors: Liu, Jiadi (1, 2); Liu, Minghuan (3); Chen, Shaoyun (3); Wang, Bingqing (3); Chen, Jin (4); Yang, Da-Peng (3); Zhang, Shangzhou (2); Du, Wenxiao (1)

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Corresponding authors: Yang, Da-Peng(yangdp@qztc.edu.cn); Zhang, Shangzhou(szzhangyt@163.com); Du, Wenxiao(duwenxiao2007@163.com)

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Publication year: 2021

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Abstract: Developing an environmental-friendly and highly active catalyst in transesterification for biodiesel production is of great importance for a more economic biodiesel process. Herein, we reported that waste eggshells were used to adsorb Au(III) in water and convert the Au(III)-polluted eggshells into the functional nanocatalyst-CaO/Au for the transesterification reaction between soybean oil and methanol to the preparation of biodiesel. By coupling of CaO and Au nanoparticles, CaO/Au nanoparticles showed superior catalytic activity for the transesterification reaction between soybean oil and methanol. An optimum performance was observed over CaO/Au nanocomposites in a methanol-oil molar ratio at 12: 1 with catalyst content of 1.0 wt% at 70 °C for 3 h. Besides, the catalytic activity of CaO/Au nanocatalyst was almost unchanged after recycling for 5 times and the yield of biodiesel still kept at 88.9%. The proof-of concept study provided us a sustainable method for utilization of waste eggshells to remedy the metal ions-polluted wastewater and the synthesis of functional nanocomposite for biodiesel production, show great potential application of waste eggshell in adsorption and catalytic reactions. © 2020 Institute of Process Engineering, Chinese Academy of Sciences

Number of references: 41

Main heading: Gold compounds

Controlled terms: Biodiesel - Calcium oxide - Catalyst activity - Gold nanoparticles - Metal ions - Metals - Methanol - Molar ratio - Nanocatalysts - Nanocomposites - Nanoparticles - Soybean oil - Synthetic fuels - Transesterification

Uncontrolled terms: Active catalyst - Biodiesel production - Catalytic reactions - Environmental-friendly - Functional nanocomposites - Optimum performance - Proof of concept - Transesterification reaction

Classification code: 523 Liquid Fuels - 531.1 Metallurgy - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 933 Solid State Physics

Numerical data indexing: Percentage 8.89e+01%, Temperature 3.43e+02K, Time 1.08e+04s

DOI: 10.1016/j.gee.2020.07.019

Funding Details: Number: JAT160402, Acronym: -, Sponsor: -; Number: 2019H0023, Acronym: -, Sponsor: Fujian Provincial Department of Science and Technology; Number: ZR2019MEM012, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: 2017G023, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: This work was supported by the Orientative project funded by Fujian Provincial Science and Technology Department (2019H0023), Quanzhou City Science & Technology Program of China (2017G023), Fujian Educational Committee (JAT160402) and Natural Science Foundation of Shandong Province , China (No. ZR2019MEM012).

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

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3. Research on international new industry cooperation in the core area of maritime silk road (Open Access)

Accession number: 20210609894138

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Publication year: 2021

Article number: 03051

Language: English

ISSN: 25550403

E-ISSN: 22671242

Document type: Conference article (CA)

Conference name: 2020 2nd International Academic Exchange Conference on Science and Technology Innovation, IAECS 2020

Conference date: December 18, 2020 - December 20, 2020

Conference location: Guangzhou, China

Conference code: 166777

Publisher: EDP Sciences

Abstract: This paper analyzes the main problems and difficulties faced by private enterprises in upgrading and upgrading in our province and explores the countermeasures for effectively accelerating the transformation and upgrading of private enterprises through several field investigations inside and outside the province. Through several provincial surveys and cross-provincial studies, the research group visited several typical private economic regions and their successful enterprises, explored their successful development experience and regional policy advantages, and put forward some countermeasures to accelerate the transformation and upgrading of private enterprises. Through investigation, the research group found that private enterprises in our province are facing problems in the new normal of economic development on private enterprises many impact; Through in-depth analysis and research, the research group puts forward the corresponding countermeasures, that is, accelerate the supply-side structural reform, and strive to provide beneficial policy advice and Suggestions for accelerating the transformation and upgrading of private enterprises in our province. This paper focuses on the research on international new industry cooperation in the core area of maritime silk road. Fujian is facing the main problems and difficulties in the international new industry cooperation. After thorough investigation and analysis, the research group put forward several feasible schemes. © The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (<http://creativecommons.org/licenses/by/4.0/>).

Number of references: 13

Main heading: Industrial economics

Controlled terms: Engineering research - Facings - Roads and streets - Silk

Uncontrolled terms: Development experiences - Economic regions - Field investigation - In-depth analysis - Investigation and analysis - Private enterprise - Regional policies - Research groups

Classification code: 402 Buildings and Towers - 406.2 Roads and Streets - 819.1 Natural Fibers - 901.3 Engineering Research - 911.2 Industrial Economics

DOI: 10.1051/e3sconf/202123303051

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

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4. Densely Quaternized Fluorinated Poly(fluorenyl ether)s with Excellent Conductivity and Stability for Vanadium Redox Flow Batteries

Accession number: 20211910310643

Authors: Chen, Yu (1); Li, Yanyan (1); Xu, Jiaqi (1); Chen, Shaoyun (2); Chen, Dongyang (1)

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ISSN: 19448244

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Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: Cationic group distribution and elemental composition are two key factors determining the conductivity and stability of anion exchange membranes (AEMs) for vanadium redox flow batteries (VRFBs). Herein, fluorinated tetra-dimethylaminomethyl-poly(fluorenyl ether)s (TAPFE)s were designed as the polymer precursors, which were reacted with 6-bromo-N,N,N-trimethylhexan-1-aminium bromide to introduce di-quaternary ammonium (DQA) containing side chains. The resultant DQA-TAPFEs with a rigid fluorinated backbone and flexible multi-cationic side chains exhibited distinct micro-phase separation as probed by small-angle X-ray scattering (SAXS) and atomic force microscopy (AFM). DQA-TAPFE-20 with an ion exchange capacity (IEC) of 1.55 mmol g⁻¹ exhibited a SO₄²⁻ conductivity of 10.1 mS cm⁻¹ at room temperature, much higher than that of a control AEM with an identical backbone but spaced out cationic groups, which had a similar IEC of 1.60 mmol g⁻¹ but a SO₄²⁻ conductivity of only 3.2 mS cm⁻¹. Due to the Donnan repulsion effect, the DQA-TAPFEs exhibited significantly lower VO₂⁺ permeability than Nafion 212. The VRFB assembled with DQA-TAPFE-20 achieved an energy efficiency of 80.4% at 80 mA cm⁻¹ and a capacity retention rate of 82.9% after the 50th cycling test, both higher than those of the VRFB assembled with Nafion 212 and other AEMs in the literature. Therefore, the rationally designed DQA-TAPFEs are promising candidates for VRFB applications. ©

Number of references: 49

Main heading: Flow batteries

Controlled terms: Atomic force microscopy - Chlorine containing polymers - Energy efficiency - Ethers - Ion exchange - Ion exchange membranes - Phase separation - Vanadium - Vanadium dioxide - X ray scattering

Uncontrolled terms: Anion exchange membrane - Capacity retention - Elemental compositions - Ion exchange capacity - Polymer precursors - Quaternary ammonium - Repulsion effects - Vanadium redox flow batteries

Classification code: 525.2 Energy Conservation - 543.6 Vanadium and Alloys - 702.1.2 Secondary Batteries - 741.3 Optical Devices and Systems - 802 Chemical Apparatus and Plants; Unit Operations; Unit Processes - 804.1 Organic Compounds - 815.1 Polymeric Materials - 932.1 High Energy Physics

Numerical data indexing: Electrical_Conductivity 1.01e+00S/m, Electrical_Conductivity 3.20e-01S/m, Magnetic_Field_Strength 8.00e+00A/m, Molality 1.55e+00mol/kg, Molality 1.60e+00mol/kg, Percentage 8.04e+01%, Percentage 8.29e+01%

DOI: 10.1021/acsami.1c04250

Funding Details: Number: 2020J01475,2020J01773, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: 51873037,51503038, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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5. Growing phosphorus dilemma: The opportunity from aquatic systems' secondary phosphorus retention capacity

Accession number: 20212910646076

Authors: Huang, Chu-Long (1, 2, 3); Kang, Weifeng (1); Xu, Su (2, 3); Gao, Bing (2, 3); Huang, Wei (2, 3); Li, Zirong (1); Cui, Shenghui (2, 3)

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Corresponding authors: Huang, Chu-Long(chuang@qztc.edu.cn); Cui, Shenghui(shcui@iue.ac.cn)

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Abbreviated source title: Sci. Total Environ.

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Article number: 148938

Language: English

ISSN: 00489697

E-ISSN: 18791026

CODEN: STEVA8

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: The essential cause of phosphorus scarcity and phosphorus-induced risks, i.e. phosphorus dilemma, mainly lies in current low phosphorus flow efficiency (PFE) in agricultural systems. Improving PFE largely depends on secondary phosphorus retention along the phosphorus flow chain from phosphate mining to terrestrial agricultural systems, to aquatic systems, and ultimately to seabed deposition. Our review found that aquatic systems will have the opportunity and growing capacity to retain seaward secondary phosphorus carried by the runoff, due to its location between land and water systems, its ability of converting secondary phosphorus from both land and aquatic systems into aquatic products, and its rapid expansion with low PFE. However, a knowledge gap exists in secondary phosphorus retention in aquatic systems compared to in terrestrial systems. Although the phosphorus retention literature continues to grow in environmental and agricultural & biological sciences, only 8.8% of the documents are related to aquatic systems with few quantification studies. Based on the literature with phosphorus retention quantification since 1979, we divided the reported phosphorus interceptors into abiotic and biotic groups, further into 7 categories and more subcategories. By 2020, eight categories of interceptors had been reported, increased from only one interceptor in 1979. However, most of them focused on wetlands, only a few studies on aquatic organisms which concentrated in 8 countries before 2000. Thus, it is urgent to emphasize aquatic systems' secondary phosphorus retention capacity and its systemic benefits for a sustainable phosphorus use. © 2021 Elsevier B.V.

Number of references: 104

Main heading: Efficiency

Controlled terms: Agriculture - Aquatic organisms

Uncontrolled terms: Agricultural system - Aquatic system - Flow efficiency - Land Systems - Phosphorus flow efficiency - Phosphorus interceptor - Phosphorus retention - Retention capacity - Secondary phosphorus retention - Sustainable phosphorus use

Classification code: 471 Marine Science and Oceanography - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 913.1 Production Engineering

Numerical data indexing: Percentage 8.80E+00%

DOI: 10.1016/j.scitotenv.2021.148938

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Funding text: This research was supported by National Natural Science Foundation of China (52070119), China; Open Foundation of State Key Laboratory of Environmental Criteria and Risk Assessment, Chinese Research Academy of Environmental Sciences (SKLECR2017OFP13), China; National Key Research and Development Program of China (2017YFC0506606), China; The National Natural Science Foundation of China (41801215), China; The Fujian Provincial Natural Science Foundation of China (2017J01660), China.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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6. Automatic segmentation of cardiac magnetic resonance images based on multi-input fusion network

Accession number: 20213210734337

Authors: Shi, Jianshe (1, 2); Ye, Yuguang (1, 3, 4); Zhu, Daxin (1, 3, 4); Su, Lianta (1, 3); Huang, Yifeng (5); Huang, Jianlong (1, 3, 4)

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Corresponding authors: Huang, Yifeng(di180ywc@163.com); Huang, Jianlong(robotics@qztc.edu.cn)

Source title: Computer Methods and Programs in Biomedicine

Abbreviated source title: Comput. Methods Programs Biomed.

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Publication year: 2021

Article number: 106323**Language:** English**ISSN:** 01692607**E-ISSN:** 18727565**CODEN:** CMPBEK**Document type:** Journal article (JA)**Publisher:** Elsevier Ireland Ltd

Abstract: Purpose: Using computer-assisted means to process a large amount of heart image data in order to speed up the diagnosis efficiency and accuracy of medical doctors has become a research worthy of investigation. Method: Based on the U-Net model, this paper proposes a multi-input fusion network (MIFNet) model based on multi-scale input and feature fusion, which automatically extracts and fuses features of different input scales to realize the detection of Cardiac Magnetic Resonance Images (CMRI). The MIFNet model is trained and verified on the public data set, and then compared with the segmentation models, namely the Fully Convolutional Network (FCN) and DeepLab v1. Results: MIFNet model segmentation of CMRI significantly improved the segmentation accuracy, and the Dice value reached 97.238%. Compared with FCN and DeepLab v1, the average Hausdorff distance (HD) was reduced by 16.425%. The capacity parameter of FCN is 124.86% of MIFNet, DeepLab v1 is 103.22% of MIFNet. Conclusion: Our proposed MIFNet model reduces the amount of parameters and improves the training speed while ensuring the simultaneous segmentation of overlapping targets. It can help clinicians to more quickly check the patient's CMRI focus area, and thereby improving the efficiency of diagnosis. © 2021

Number of references: 43**Main heading:** Image segmentation**Controlled terms:** Computer aided diagnosis - Convolution - Efficiency - Heart - Image fusion - Magnetic resonance - Magnetic resonance imaging - Magnetism - Medical imaging**Uncontrolled terms:** Automatic image segmentation - Automatic segmentations - Cardiac magnetic resonance images - Convolutional networks - Deeplab v1 - Fully convolutional network - Multi-input fusion network network - Multi-scale input - Multiinput - Network models**Classification code:** 461.1 Biomedical Engineering - 461.2 Biological Materials and Tissue Engineering - 701.2 Magnetism: Basic Concepts and Phenomena - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 746 Imaging Techniques - 913.1 Production Engineering**Numerical data indexing:** Percentage 1.0322E+02%, Percentage 1.2486E+02%, Percentage 1.6425E+01%, Percentage 9.7238E+01%**DOI:** 10.1016/j.cmpb.2021.106323

Funding text: This research is supported by Science and Technology Program of Quanzhou (No. 2021CT0010). The authors also acknowledge the support by Fujian Provincial Key Laboratory of Data-Intensive Computing, Fujian University Laboratory of Intelligent Computing and Information Processing, and Fujian Provincial Big Data Research Institute of Intelligent Manufacturing.

Compendex references: YES**Database:** Compendex**Data Provider:** Engineering Village

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7. Three-band perfect absorber with high refractive index sensing based on an active tunable Dirac semimetal

Accession number: 20213510826001**Authors:** Li, Zhiyou (1); Yi, Zao (1); Liu, Tinting (1); Liu, Li (1); Chen, Xifang (1); Zheng, Fusheng (1); Zhang, Jianguo (2); Li, Hailiang (3); Wu, Pinghui (4); Yan, Peiguang (5)

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Corresponding author: Li, Zhiyou(yizaomy@swust.edu.cn)**Source title:** Physical Chemistry Chemical Physics**Abbreviated source title:** Phys. Chem. Chem. Phys.**Volume:** 23**Issue:** 32**Issue date:** August 28, 2021

Publication year: 2021

Pages: 17374-17381

Language: English

ISSN: 14639076

CODEN: PPCPFQ

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: In this paper, we designed a three-band narrowband perfect absorber based on bulk Dirac semi-metallic (BDS) metamaterials. The absorber consists of a hollow Dirac semi-metallic layer above, a gold layer below and a photonic crystal slab (PCS) in the middle. The study found that the terahertz wave absorber achieved three perfect absorption rates of more than 95% in the range of 1 to 2.4 THz. The minimum bandwidth (FWHM) is 0.02 THz, and the maximum quality factor (Q) is 106. A reasonable explanation of high absorption can be obtained by impedance matching, electric dipole and other principles. The absorption spectra of the two polarizations show different responses at different incident angles. In addition, we also obtained the influence of the structural parameters of the upper layer of the metamaterial on the absorption performance. We defined the refractive index sensitivity (S) with a maximum sensitivity of 0.1525 THz RIU⁻¹ and a highest quality factor (FOM) of 4.26 in the refractive index range of 1 to 1.8. The maximum adjustable range is 0.06 THz in the Fermi energy range of 60 to 140 meV. Because of its excellent characteristics, our absorber will have good development prospects in the fields of optical switching, biochemical imaging, and space detection. © the Owner Societies.

Number of references: 58

Main heading: Refractive index

Controlled terms: Metamaterials - Terahertz waves

Uncontrolled terms: Absorption performance - Adjustable ranges - Development prospects - High refractive index - Maximum sensitivity - Photonic crystal slab - Refractive index sensitivity - Structural parameter

Classification code: 711 Electromagnetic Waves - 741.1 Light/Optics - 951 Materials Science

Numerical data indexing: Frequency 1.00e+12Hz to 2.40e+12Hz, Frequency 1.52e+11Hz, Frequency 2.00e+10Hz, Frequency 6.00e+10Hz, Percentage 9.50e+01%, Electron_Volt 6.00e-02eV to 1.40e-01eV

DOI: 10.1039/d1cp01375k

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Funding text: The authors are grateful to the support by the National Natural Science Foundation of China (No. 51606158, 11604311, 61705204, 21506257); the funding from the Scientific Research Fund of Sichuan Provincial Science and Technology Department (2020YJ0137; 2020YFG0467; 2021JDRC0019); Decision funding by Southwest University of Science and Technology (JZ20-027, JZ20-025); the Undergraduate Innovation Fund Project of SWUST (CX 21-099, LX2020010).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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8. Vanadium carbide nanodots anchored on N doped carbon nanosheets fabricated by spatially confined synthesis as a high-efficient electrocatalyst for hydrogen evolution reaction

Accession number: 20210609880449

Authors: Peng, Xinyan (1); Huang, Chao (2); Zhang, Biao (3); Liu, Yunhong (1)

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Corresponding authors: Huang, Chao(chuang46-c@my.cityu.edu.hk); Liu, Yunhong(liuyunhong@qztc.edu.cn)

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Article number: 229551

Language: English

ISSN: 03787753

CODEN: JPSODZ

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Creating more active sites is an ideal strategy to enhance a catalyst's performance in which the trigger needs a nanosized or micro-grained structure. However, it suffers inevitable aggregation during the fabrication process resulting in the low hydrogen evolution reaction (HER) activity. Herein, vanadium carbide nanodots with 7.5 nm in size anchored on N doped carbon nanosheets (VC/NC) are synthesized by magnesiothermic reduction (MTR) using hybrid vanadium pentoxide (V₂O₅)/polyaniline composite as the precursor. During MTR, the V₂O₅ species in situ convert into VC nanodots, and the polyaniline layers translate into NC nanosheets. Owing to the highly conductive and stable NC nanosheets and abundance of active sites on VC nanodots, the VC/NC delivers a small overpotential of 76 mV at a current density of 10 mA cm⁻² with Tafel slope of 46 mV dec⁻¹ and excellent stability in 0.5 M H₂SO₄. The X-ray Photo-electronic Spectroscopy (XPS) and density functional theory (DFT) calculations reveal that the charge transfers from NC to VC, causing moderate H binding energy. This novel concept can be extended to prepare ultrafine metal oxides, carbides, and nitrides nanodots. © 2021 Elsevier B.V.

Number of references: 50

Main heading: Hydrogen evolution reaction

Controlled terms: Binding energy - Carbides - Carbon - Catalyst activity - Charge transfer - Density functional theory - Doping (additives) - Electrocatalysts - Fabrication - Hydrogen - Nanodots - Nanosheets - Polyaniline - Slope stability - Sulfuric acid - Vanadium pentoxide

Uncontrolled terms: Confined synthesis - Electronic spectroscopy - Fabrication process - High efficient - Magnesiothermic reduction - Overpotential - Polyaniline layers - Vanadium carbides

Classification code: 406.2 Roads and Streets - 708.2 Conducting Materials - 761 Nanotechnology - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 922.1 Probability Theory - 933 Solid State Physics

Numerical data indexing: Size 7.50e-09m, Voltage 4.60e-02V, Voltage 7.60e-02V

DOI: 10.1016/j.jpowsour.2021.229551

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Funding text: This work was financially supported by the Natural Science Foundation of Fujian Province, China (Grant No. 2020J05152 and 2020J05153) and the Ph.D. Research Start-up Fund Project of Quanzhou Normal University .

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

9. Low-temperature tolerant strain sensors based on triple crosslinked organohydrogels with ultrastretchability

Accession number: 20203309043451

Authors: Yu, Qingyu (1); Qin, Zhihui (1); Ji, Feng (3); Chen, Shuang (1); Luo, Shuiyuan (3); Yao, Mengmeng (1); Wu, Xiaojun (1); Liu, Wenwen (1); Sun, Xia (1); Zhang, Haitao (1); Zhao, Yilan (1); Yao, Fanglian (1, 2, 4); Li, Junjie (1, 2)

Author affiliation: (1) School of Chemical Engineering and Technology, Tianjin University, Tianjin; 300350, China; (2) Frontiers Science Center for Synthetic Biology and Key Laboratory of Systems Bioengineering (Ministry of Education), Tianjin University, Tianjin; 300350, China; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China; (4) School of Materials Science and Engineering, East China Jiaotong University, Nanchang; 330013, China

Corresponding author: Yao, Fanglian(yaofanglian@tju.edu.cn)

Source title: Chemical Engineering Journal

Abbreviated source title: Chem. Eng. J.

Volume: 404

Issue date: 15 January 2021

Publication year: 2021

Article number: 126559

Language: English

ISSN: 13858947

CODEN: CMEJAJ

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Flexible electronic sensors based on conductive hydrogels have received extensive attention in the field of smart wearable electronics. However, the existing hydrogels usually cannot meet the necessary requirements due to their relatively narrow strain range, and low stability, especially at subzero temperatures. In this study, a xanthan gum-Fe³⁺/polyacrylamide-glycerol (XG-Fe³⁺/PAAm-GI) organohydrogel was prepared via the polymerization in situ and solvent-exchange method. XG was initially used to prepare organohydrogels-based sensors with multiple interactions, including covalent cross-linking interaction, ionic coordination interaction and hydrogen bonds. The prepared organohydrogel possesses excellent mechanical properties, such as, ultrastretchability (~1769%) and high strength (~1.5 MPa). In addition, a water-glycerol binary solvent endows the organohydrogel with excellent long-term anti-drying and anti-freezing capabilities, and it can maintain excellent stretchability (>500%), good conductivity and transparency even at -40 °C. A simple biosensor was fabricated using the XG-Fe³⁺/PAAm-GI organohydrogel and was used to monitor the detection of human physiological motions, showing remarkable sensitivity and a wide strain range (5% to 500% strain) under a broad range of temperatures (-40 °C to 25 °C). The XG-Fe³⁺/PAAm-GI organohydrogel is expected to meet the requirements of flexible sensors for adaption to many complicated environments. © 2020 Elsevier B.V.

Number of references: 51

Main heading: Wearable sensors

Controlled terms: Flexible electronics - Hydrogels - Hydrogen bonds - Iron compounds - Temperature - Xanthan gum

Uncontrolled terms: Binary solvents - Coordination interactions - Covalent crosslinking - Low temperatures - Multiple interactions - Solvent exchanges - Sub-zero temperatures - Tolerant strains

Classification code: 641.1 Thermodynamics - 715 Electronic Equipment, General Purpose and Industrial - 801.4 Physical Chemistry - 804 Chemical Products Generally - 804.1 Organic Compounds

Numerical data indexing: Percentage 5.00e+00% to 5.00e+02%, Temperature 2.98e+02K

DOI: 10.1016/j.ccej.2020.126559

Funding Details: Number: -, Acronym: -, Sponsor: Young Scientists Fund; Number: 2018YFC1105502, Acronym: -, Sponsor: National Basic Research Program of China (973 Program); Number: JAT190517, Acronym: -, Sponsor: -; Number: 31870948,31971250, Acronym: -, Sponsor: -; Number: 31722022, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This work is supported by The Excellent Young Scientists Fund by National Natural Science Foundation of China (No. 31722022), National Nature Science Foundation of China (No. 31870948 and 31971250), National Key Research and Development Program of China (No. 2018YFC1105502) and Education and scientific research project for young and middle-aged teachers in Fujian Province (JAT190517).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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10. Competitive Ion Migration and Process Optimization of Carbon Sequestration and Seawater Decalcification in a Bipolar Electrodialysis Process

Accession number: 20211410168297

Authors: Chen, Tianyi (1); Zhao, Yanshuang (1); Zhao, Yixin (1); Xie, Yue (1); Ji, Zhiyong (1, 2); Guo, Xiaofu (1, 2); Zhao, Yingying (1, 2, 4); Yuan, Junsheng (3)

Author affiliation: (1) School of Chemical Engineering and Technology, Hebei University of Technology, No. 8 Guangrongdao Road, Hongqiao District; Tianjin; 300130, China; (2) Hebei Collaborative Innovation Center of Modern Marine Chemical Technology, No. 8 Guangrongdao Road, Hongqiao District; Tianjin; 300130, China; (3) Quanzhou Normal University, 398 Donghai Dajie, Fengze District; Fujian; 362000, China; (4) Tianjin Key Laboratory of Chemical Process Safety, Tianjin; 300130, China

Corresponding author: Zhao, Yingying(luckyzhaoyy@126.com)

Source title: ACS Sustainable Chemistry and Engineering

Abbreviated source title: ACS Sustainable Chem. Eng.

Volume: 9

Issue: 25

Issue date: June 28, 2021

Publication year: 2021

Pages: 8372-8382

Language: English

E-ISSN: 21680485

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: In the process of carbon dioxide mineralization and seawater decalcification via bipolar membrane electrodialysis (BMED), HCO_3^- can act with OH^- to form CO_3^{2-} , and there are complex reactions between $\text{Ca}^{2+}/\text{Mg}^{2+}$ ions in seawater and $\text{OH}^-/\text{HCO}_3^-/\text{CO}_3^{2-}$. In this study, the competitive reaction and migration rates between HCO_3^- , CO_3^{2-} , and OH^- were investigated. It is interesting to find that if the reaction rate between OH^- and HCO_3^- is higher than the migration rate, then it is possible that no OH^- exists in the membrane system by controlling the current density and the rate of CO_2 entry. Seeding in the crystallizer is a good strategy for avoiding the scaling in the membrane system as for the relatively wider metastable zone of CaCO_3 . However, long operation run and massive crystals would bring the risk of particle introduction to the membrane stack and large energy consumption. The dispersion of CO_2 is enhanced by adequate ventilation equipment and the metastable zone is fully utilized by a self-crystallization process, thus the carbon fixation is increased to 100% and the decalcification ratio to 94.43%, but the operation time and the energy consumption of the electrodialysis process are sharply shortened. These findings suggest potential applications in mineral carbonation and seawater decalcification by BMED. © 2021 American Chemical Society.

Number of references: 47

Main heading: Carbon dioxide process

Controlled terms: Calcite - Calcium carbonate - Carbon dioxide - Dialysis membranes - Electrodialysis - Energy utilization - Optimization - Reaction rates - Seawater

Uncontrolled terms: Bipolar electrodialysis - Bipolar membrane Electrodialysis - Carbon dioxide mineralization - Carbon sequestration - Competitive reactions - Crystallization process - Mineral carbonation - Ventilation equipments

Classification code: 471.4 Seawater, Tides and Waves - 525.3 Energy Utilization - 534.2 Foundry Practice - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 921.5 Optimization Techniques

Numerical data indexing: Percentage 1.00e+02%, Percentage 9.44e+01%

DOI: 10.1021/acssuschemeng.0c09232

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

11. Effect of Epoxy Soybean Oil on the Structure and Properties of Styrene-b-Ethylene-Co-Butylene-b-Styrene Copolymers

Accession number: 20213810903493

Title of translation: -/-

Authors: Zhang, Xianghan (1); Zhu, Junqiu (1); Ji, Feng (1); Guo, Jiangbin (1); Liang, Hongwen (2); Zhang, Aimin (3); Luo, Shuiyuan (1)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Fujian Engineering and Research Center of Green and Environment-Friendly Functional Footwear Materials, Quanzhou; 362000, China; (2) Balin Petrochemical Co., Ltd., China Petroleum & Chemical Corporation, Yueyang; 414000, China; (3) Polymer Research Institute of Sichuan University, Chengdu; 610065, China

Corresponding authors: Guo, Jiangbin(jbguo@qztc.edu.cn); Liang, Hongwen(Lianghw.blsh@sinopec.com)

Source title: Gaofenzi Cailiao Kexue Yu Gongcheng/Polymeric Materials Science and Engineering

Abbreviated source title: Gaofenzi Cailiao Kexue Yu Gongcheng

Volume: 37

Issue: 6

Issue date: June 2021

Publication year: 2021

Pages: 94-98 and 108

Language: Chinese

ISSN: 10007555

CODEN: GCKGEI

Document type: Journal article (JA)

Publisher: Sichuan University

Abstract: The structure and properties of styrene-b-ethylene-co-butylene-b-styrene copolymers (SEBS) modified with epoxidized soybean oil (ESO) were studied. The results of FT-IR show that when 9 phr epoxy soybean oil was added into SEBS, a absorption peak appears in the range of 1750 cm^{-1} . Small angle X-ray scattering (SAXS) results show that the interaction between epoxidized soybean oil and SEBS could affect the aggregation structure of SEBS, which reflects that the interphase distance of SEBS is increased from 56.07 nm to 59.25 nm and the size distribution of microphase is widened. This would lead to the decrease of viscosity after ESO modification, which reflects that the viscosity at 200 is decreased from 19186.8 $\text{Pa}\cdot\text{s}$ to 8111.5 $\text{Pa}\cdot\text{s}$. At the same time, the initial decomposition

temperature is decreased from 389 to 354 , the glass transition temperature is decreased from -29.6 to -34.4 , the thermal stability of SEBS is decreased, the molecular chain flexibility is increased, the crystallinity is decreased, and the tensile strength is decreased from 22.4 MPa to 20.6 MPa. © 2021, Editorial Board of Polymer Materials Science & Engineering. All right reserved.

Number of references: 13

Main heading: Soybean oil

Controlled terms: Bond (masonry) - Butenes - Crystallinity - Glass transition - Polystyrenes - Styrene - Tensile strength - Thermodynamic stability - Viscosity - X ray scattering

Uncontrolled terms: Absorption peaks - Aggregation structure - Epoxidized soybean oil - Initial decomposition temperatures - Micro-phase - Molecular chains - Structure and properties - Styrene copolymers

Classification code: 412 Concrete - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 802.3 Chemical Operations - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 932.1 High Energy Physics

Numerical data indexing: Pressure 2.24e+07Pa to 2.06e+07Pa, Size 5.61e-08m to 5.93e-08m

DOI: 10.16865/j.cnki.1000-7555.2021.0172

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

12. Sound insulation properties of honeycomb sandwich structure composite for high-speed train floors

Accession number: 20214411088020

Title of translation:

Authors: Hu, Qiaole (1); Bian, Guofeng (2); Qiu, Yiping (2, 3); Wei, Yi (2, 4); Xu, Zhenzhen (1)

Author affiliation: (1) School of Textile and Garment, Anhui Polytechnic University, Wuhu; 241000, China; (2) College of Textiles, Donghua University, Shanghai; 201620, China; (3) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; 362000, China; (4) Center for Civil Aviation Composites, Donghua University, Shanghai; 201620, China

Corresponding author: Xu, Zhenzhen(xuzhenzhen@ahpu.edu.cn)

Source title: Fangzhi Xuebao/Journal of Textile Research

Abbreviated source title: Fangzhi Xuebao/J. Text. Res.

Volume: 42

Issue: 10

Issue date: October 15, 2021

Publication year: 2021

Pages: 75-83

Language: Chinese

ISSN: 02539721

Document type: Journal article (JA)

Publisher: China Textile Engineering Society

Abstract: In order to meet the lightweight and sound insulation requirements of bullet trains and automobiles, honeycomb sandwich composite structure made from various fibers were created. The influence of honeycomb core specifications (density and side length), panel materials (carbon fiber, glass fiber, polyphenylene sulfide (PPS)) and glass microbeads modification on sound insulation performance was analyzed by hot pressing method and four-sensor impedance tube method. The results show that the sound insulation performance is improved with the increase of the density of the honeycomb core, but the side length of the honeycomb core has little effect on the sound insulation. In the region of 100-2500 Hz, the honeycomb sandwich panel with PPS as inner layer, carbon fiber as outer layer and glass beads content of 5% shows the best sound insulation, with an average improvement of 5-8 dB. Compared with the standard aluminum honeycomb sandwich panel used for the current 350 km/h motor vehicle, the aramid honeycomb panel not only exhibits similar sound insulation performance, but also can achieve about 30% weight reduction. It was concluded that the aramid honeycomb sandwich panel has the application potential for replacing the standard aluminum honeycomb as a new generation of sound insulation floor for bullet trains. © 2021, Periodical Agency of Journal of Textile Research. All right reserved.

Number of references: 31

Main heading: Floors

Controlled terms: Aluminum - Carbon fibers - Concrete slabs - Foams - Glass - Honeycomb structures - Hot pressing - Sandwich structures - Sound insulation - Sulfur compounds

Uncontrolled terms: Aramid honeycomb - Aramid honeycomb sandwich - Glass bead - Honeycomb core - Honeycomb sandwich - Prepregs - Rail vehicle floor - Rail vehicles - Sound insulation performance - Sound insulation property

Classification code: 402 Buildings and Towers - 408.2 Structural Members and Shapes - 412 Concrete - 413.3 Sound Insulating Materials - 541.1 Aluminum - 804 Chemical Products Generally - 812.3 Glass

Numerical data indexing: Decibel 5.00E+00dB to 8.00E+00dB, Frequency 1.00E+02Hz to 2.50E+03Hz, Percentage 3.00E+01%, Percentage 5.00E+00%, Size 3.50E+05m

DOI: 10.13475/j.fzxb.20210107009

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

13. Research on a Covert Communication Model Realized by Using Smart Contracts in Blockchain Environment

Accession number: 20211210103478

Authors: Zhang, Lejun (1); Zhang, Zhijie (2); Wang, Weizheng (3); Jin, Zilong (4); Su, Yansen (5); Chen, Huiling (6)

Author affiliation: (1) College of Information Engineering, Yangzhou University, Yangzhou 225009 China and also with the School of Mathematics and Computer Science, Quanzhou Normal University, Fujian 362000 China (e-mail: zhanglejun@yzu.edu.cn).; (2) College of Information Engineering, Yangzhou University, Yangzhou 225009 China (e-mail: zhangzj0326@163.com).; (3) School of Computer Science and Engineering, University of Aizu, Aizuwakamatsu 965-8580 Japan (e-mail: m5232117@u-aizu.ac.jp).; (4) Nanjing University of Information Science and Technology, Nanjing 210044 China (e-mail: zljn@nuist.edu.cn).; (5) Anhui University, Hefei 230601 China (e-mail: suyansen@ahu.edu.cn).; (6) Wenzhou University, Zhejiang 325035 China (e-mail: chenhuiling.jlu@gmail.com).

Source title: IEEE Systems Journal

Abbreviated source title: IEEE Syst. J.

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 19328184

E-ISSN: 19379234

Document type: Article in Press

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: The traditional covert communication channel relying on a third-party node is vulnerable to attack. The data are easily tampered with and the identity information of the communication party is fragile. Blockchain has the characteristics of decentralization and tamper resistance, which can effectively solve the above problems. In addition, some confidential information needs to be transmitted covertly in the transparent blockchain. A smart contract deployed in the blockchain to automatically realize its function can replace a centralized node to provide credible guarantee for communication. The diversity of parameters, data redundancy, and code programmability of smart contract make it an excellent carrier for covert communication under blockchain. In this article, we propose a covert communication model combined with smart contracts to covertly transfer information in the blockchain environment. To implement this model, we use the parameters in the contract to map the secret information sequence, and call the contract to transfer message. Voting contract and secret bidding contract are combined to instantiate the proposed model, and optimized versions of the two contracts are also proposed to reduce costs. Moreover, we use encryption algorithms and two-round protocols to ensure data privacy and design corresponding information embedding and transmission methods for different scenarios. To improve the concealment of communication, redundant options, effective price ranges, and invalid bids are set in two contracts, respectively. The experimental results show that the proposed model has tamper resistance and low complexity, and it is feasible to use this model for covert communication. IEEE

Main heading: Carrier communication

Controlled terms: Blockchain - Cryptography - Information theory - Privacy by design

Uncontrolled terms: Confidential information - Covert communications - Encryption algorithms - Identity information - Information embedding - Secret information - Transfer information - Transmission methods

Classification code: 716.1 Information Theory and Signal Processing

DOI: 10.1109/JSYST.2021.3057333

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

14. A numerical study on the influence of hole defects on impact behavior of Twaron® fabric subjected to low-velocity impacts (Open Access)

Accession number: 20212210435687

Authors: Huang, Canyi (1, 2); Cui, Lina (1, 2); Xia, Hong (3, 4); Qiu, Yiping (2); Ni, Qing-Qing (3, 4)

Author affiliation: (1) Interdisciplinary Graduate School of Science and Technology, Shinshu University, Ueda, Japan; (2) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou, China; (3) Key Laboratory of Advanced Textile Materials and Manufacturing Technology, Ministry of Education, Zhejiang Sci-Tech University, Hangzhou, China; (4) Department of Mechanical Engineering and Robotics, Shinshu University, Ueda, Japan

Corresponding author: Ni, Qing-Qing(niqq@shinshu-u.ac.jp)

Source title: Journal of Engineered Fibers and Fabrics

Abbreviated source title: J. Eng. Fibers Fabr.

Volume: 16

Issue date: 2021

Publication year: 2021

Language: English

E-ISSN: 15589250

Document type: Journal article (JA)

Publisher: SAGE Publications Ltd

Abstract: In the present study, a finite element impact model was created and analyzed by commercial FEM code ANSYS®-AUTODYN and then validated by drop weight impact experiment. Moreover, models of single- and multilayer panels of plain weave as well as different weaving architectures were designed and created with and without holes to compare impact properties. The influence of the size and location of hole defect on the impact behavior of single-layer Twaron® fabric were investigated, the degree of influence of hole defects with different sizes on the impact behavior and the influence level by different location of the hole defects were well investigated in. In addition, the effect of hole defects on the impact behavior of multi-layer armor panel were studied. Hole defects were less influential in terms of impact contact force and had less severe constraining effect on front layer of the panel when the number of multi-layer armor panels increased. Furthermore, the effect of hole defects on the impact behavior of different weaving architectures (i.e. plain, twill, basket, and satin weave) were analyzed. Plain weave fabric had the highest energy absorption capability in impact scenarios with and without holes among all the woven architectures. Plain weave fabric was the most affected and twill weave was the least affected by hole defects in terms of transverse wave velocity; the satin weave was the most affected and the twill weave was the least affected by hole defects in terms of energy absorption. These findings will provide guidance for engineering of soft body armour and composite materials. © The Author(s) 2021.

Number of references: 38

Main heading: Weaving

Controlled terms: Aramid fibers - Architecture - Armor - Composite structures - Defects - Energy absorption - Silk - Structural panels - Wave propagation

Uncontrolled terms: Constraining effects - Drop weight impact - Energy absorption capability - Impact contact forces - Low velocity impact - Plain weave fabrics - Provide guidances - Transverse wave velocity

Classification code: 402 Buildings and Towers - 404.1 Military Engineering - 408.2 Structural Members and Shapes - 819 Synthetic and Natural Fibers; Textile Technology - 951 Materials Science

DOI: 10.1177/15589250211018414

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

15. An approach of covert communication based on the Ethereum whisper protocol in blockchain

Accession number: 20204809554153

Authors: Zhang, Lejun (1, 2); Zhang, Zhijie (1); Jin, Zilong (3); Su, Yansen (4); Wang, Zhuzhu (5)

Author affiliation: (1) College of Information Engineering, Yangzhou University, Yangzhou, China; (2) School Mathematics and Computer Science, Quanzhou Normal University, Quanzhou, China; (3) School of Computer and Software, Nanjing University of Information Science and Technology, Nanjing, China; (4) Key Laboratory of Intelligent Computing and Signal Processing of Ministry of Education, School of Computer Science and Technology, Anhui University, Hefei, China; (5) School of Cyber Engineering, Xidian University, Xi'an, China

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Source title: International Journal of Intelligent Systems

Abbreviated source title: Int J Intell Syst

Volume: 36

Issue: 2

Issue date: February 2021

Publication year: 2021

Pages: 962-996

Language: English

ISSN: 08848173

E-ISSN: 1098111X

CODEN: IJISED

Document type: Journal article (JA)

Publisher: John Wiley and Sons Ltd

Abstract: The traditional covert communication that relies on a central node is vulnerable to detection and attack. Applying blockchain to covert communication can improve the channel's anti-interference and antitampering. Whisper is the communication protocol of Ethereum, which mainly relies on payload to store information and padding to expand. These two fields can store a large amount of information, creating conditions for the realization of covert communication. In this paper, we propose a covert communication method based on the whisper protocol to covertly transfer information in the blockchain. To implement this method, we use payload to store the carrier information, matching it with the secret message. The generated index is recorded in the padding field. To improve the concealment of communication, we simulate the default filling rules of the protocol to maintain the message size. A new topic–key pair interaction method is also proposed to improve the security of the model. Moreover, the anti-interference, antitampering and antidetection of the newly proposed model are verified through theoretical analysis and experiment. The experimental findings show that the amount of information in the proposed method is 4.7 times that of the traditional time-based covert communication. The time consumption of information transmission is reduced to 52.25% under the same settings and even less in actual use. The cost of the new topic–key pair interaction is reduced by nearly 50% compared with the original method. © 2020 Wiley Periodicals LLC

Number of references: 40

Main heading: Blockchain

Controlled terms: Ethereum

Uncontrolled terms: Amount of information - Anti-interference - Central nodes - Covert communications - Information transmission - Secret messages - Time consumption - Transfer information

Numerical data indexing: Percentage 5.00e+01%, Percentage 5.22e+01%

DOI: 10.1002/int.22327

Funding Details: Number: LC2016024, Acronym: -, Sponsor: Natural Science Foundation of Heilongjiang Province;

Number: XYDXX#108, Acronym: -, Sponsor: Six Talent Peaks Project in Jiangsu Province; Number: 17KJB520044,

Acronym: -, Sponsor: Natural Science Research of Jiangsu Higher Education Institutions of China;

Funding text: This study is sponsored by the Natural Science Foundation of Heilongjiang Province of China under grant no. LC2016024, Natural Science Foundation of the Jiangsu Higher Education Institutions under grant no. 17KJB520044, and Six Talent Peaks Project in Jiangsu Province no. XYDXX108.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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16. Image-based Bilateral Beard Method for measuring weight-based short fiber contents in raw cotton and semi-finished slivers

Accession number: 20211010020022

Authors: Lang, Chenhong (1); Zhang, Mingming (1); Wang, Tingrong (2); Jin, Jingye (1); Wang, Fumei (3); Xu, Bugao (4); Qiu, Yiping (1, 3)

Author affiliation: (1) College of Textiles and Apparel, Quanzhou Normal University, China; (2) Qiandongnan Vocational Technical College for Nationalities, China; (3) College of Textiles, Donghua University, China; (4) Department of Merchandising and Digital Retailing, University of North Texas, United States

Corresponding author: Jin, Jingye(jin_jingye@163.com)

Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Volume: 91

Issue: 19-20

Issue date: October 2021

Publication year: 2021

Pages: 2184-2193

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Journal article (JA)

Publisher: SAGE Publications Ltd

Abstract: In this paper, an economical way for accurately determining weight-based short fiber contents in raw cotton and semi-finished slivers by utilizing special bilateral beard specimens and image processing was introduced. In the specimen preparation, cotton fibers were drawn by a manual device into a sliver, then the sliver was combed to form a bilateral beard specimen, and finally the bilateral beard was scanned to generate a grayscale image from which a relative fiber number curve was extracted. An algorithm for calculating the weight-based short fiber contents based on the curve was proposed. Five types of cottons were repetitively measured to investigate the robustness of the results of (Formula presented.) and (Formula presented.), with the weight ratio of fibers shorter than 12.7 and 16 mm, respectively. The results showed that measuring two bilateral beards for each sample could keep the error rate lower than 15%, while four specimens kept the error rate lower than 10%. Compared with AFIS Pro 2, this Image-based Bilateral Beard Method provided results with lower standard deviations and variable coefficients, signifying its analogous or better robustness. In addition, 37 samples from some of the world's major producing areas were measured by this method and AFIS Pro 2, and a Bland–Altman analysis confirmed a good agreement between the results from the two methods. As only a manual fiber drawing device and an office scanner are needed, this Image-based Bilateral Beard Method is clearly a cheap approach for accurately determining the short fiber contents in raw cotton and semi-finished slivers. © The Author(s) 2021.

Number of references: 41

Main heading: Image processing

Controlled terms: Cotton - Fibers

Uncontrolled terms: Fiber drawing - Gray-scale images - Producing areas - Semi-finished - Short fiber contents - Standard deviation - Variable coefficients - Weight ratios

Classification code: 821.4 Agricultural Products

Numerical data indexing: Percentage 1.00e+01%, Percentage 1.50e+01%, Size 1.27e-02m, Size 1.60e-02m

DOI: 10.1177/0040517521997465

Funding Details: Number: 2019J05106, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province;

Number: 2017ZT002, Acronym: -, Sponsor: -; Number: 51803108,51673036, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018G011,2019G028, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by National Natural Science Foundation of China (Grant No: 51673036, 51803108), Fujian Provincial Natural Science Foundation of China (Grant No: 2019J05106), Quanzhou City Science & Technology Program of China (Grant Nos: 2019G028, 2018G011), and Quanzhou Home-bay Recruitment Program of Global Talents (Grant No: 2017ZT002).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

17. Anchoring Core-Shell Cu@Cu₂O Nanoparticles to Two-Dimensional Carbon Nanosheets for Bacterial Disinfection

Accession number: 20214010972314

Authors: Sun, Guihong (1); Jia, Shanshan (2); Zhang, Xiaoyan (2); Kang, Zewen (2); Cui, Malin (2); Wang, Bingqing (2); Wang, Bo (2); Yang, Da-Peng (2)

Author affiliation: (1) School of Environmental and Material Engineering, Yantai University, Shandong, Yantai; 264005, China; (2) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Fujian, Quanzhou; 362000, China

Corresponding authors: Zhang, Xiaoyan(xzhang@qztc.edu.cn); Wang, Bo(ytuwangb@126.com); Yang, Da-Peng(yangdp@qztc.edu.cn)

Source title: ACS Applied Nano Materials

Abbreviated source title: ACS Appl. Nano Mat.

Volume: 4

Issue: 9

Issue date: September 24, 2021

Publication year: 2021

Pages: 9831-9841

Language: English

E-ISSN: 25740970

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: The unique physicochemical properties and relatively higher biosafety endow carbon-based nanomaterials with much worldwide attention. However, studies of the synthesis and functionalization of carbon nanosheets are still very limited, which largely impedes the development of carbon-based materials for antibacterial applications. In this work, carbon nanosheets decorated with core-shell Cu@Cu₂O nanoparticles (Cu@Cu₂O/C) were prepared by a facial hydrothermal method using copper d-gluconate. The in situ-generated carbon nanosheets feature a homogeneous size distribution with an average diameter of 3 μm and thickness of 5 nm. The particle size of Cu@Cu₂O is mainly distributed between 10.5 and 13.5 nm. Particularly, these nanosheets could not only effectively anchor Cu@Cu₂O core-shell structured nanoparticles but also bring more edge active sites, which could promote the generation of free radicals. The as-prepared Cu@Cu₂O/C verified by varieties of characterizations were used as antibacterial samples to kill the Gram-negative bacterium *Escherichia coli* and the Gram-positive bacterium *S. aureus* with antibacterial efficiencies of up to 100 and 96.0%, respectively, within 12 min in the dark condition. A possible antibacterial mechanism of the •OH-dominated radical combined with the sharp edges of carbon nanosheets was confirmed by a series of control experiments. Overall, the present work provides a simple strategy to prepare carbon-based antibacterial agents, which sheds light on the understanding of the antibacterial mechanism of carbon-based nanomaterials. © 2021 American Chemical Society

Number of references: 53

Main heading: Copper

Controlled terms: Carbon - Copper oxides - *Escherichia coli* - Free radicals - Nanoparticles - Nanosheets - Nanostructured materials - Particle size - Physicochemical properties - Shells (structures)

Uncontrolled terms: Anchorings - Antibacterial mechanisms - Antibacterials - Bacterial infections - Carbon nanosheets - Carbon-based - Core shell - Core shell structure - Physicochemical property - Two-dimensional

Classification code: 408.2 Structural Members and Shapes - 544.1 Copper - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933 Solid State Physics - 933.1 Crystalline Solids

Numerical data indexing: Percentage 1.00E+02%, Percentage 9.60E+01%, Size 1.05E-08m to 1.35E-08m, Size 3.00E-06m, Size 5.00E-09m, Time 7.20E+02s

DOI: 10.1021/acsanm.1c02233

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

18. Multi-band and high-sensitivity perfect absorber based on monolayer graphene metamaterial

Accession number: 20205209694495

Authors: Jiang, Liying (1); C., Yuan; Z., Li; J., Su; Z., Yi; W., Yao; P., Wu; Z., Liu; S., Cheng; M., Pan

Author affiliation: (1) Joint Laboratory for Extreme Conditions Matter Properties, Southwest University of Science and Technology, Mianyang; 621010, China; (2) College of Physics & Information Engineering, Quanzhou Normal University, Quanzhou; 362000, China; (3) School of Science, East China Jiaotong University, Nanchang; 330013, China; (4) School of Physics and Optoelectronic Engineering, Yangtze University, Jingzhou; Hubei; 434023, China; (5) Department of Hematology, Xiangya Hospital, Central South University, Changsha; 410000, China

Corresponding author: Yi, Zao(yizaomy@swust.edu.cn)

Source title: Diamond and Related Materials

Abbreviated source title: Diamond Relat. Mat.

Volume: 111

Issue date: January 2021

Publication year: 2021

Article number: 108227

Language: English

ISSN: 09259635

CODEN: DRMTE3

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: The Finite Difference Time Domain (FDTD) method is used for the simulation, and a new method based on critical coupling and guided resonance is proposed theoretically and numerically to realize a multi-band ideal absorber (PA) of monolayer graphene. Its physical mechanism can be more perfectly analyzed through impedance matching and coupled mode theory (CMT). Due to the guided resonance (100% transmission or reflection efficiency is obtained through the coupling of the leakage mode and the guided mode under the phase matching condition), the perfect absorber can obtain four perfect absorption peaks. The resonance wavelengths are located at $\lambda_1 = 1085.03$ nm, $\lambda_2 = 1131.48$ nm, $\lambda_3 = 1187$ nm and $\lambda_4 = 1365.35$ nm, respectively. Their absorption rates are 95.88%, 99.81%, 97.44% and 95.30%. At the same time, we can also see a phenomenon in which the spectral position and value of the absorption peak can be adjusted by changing the relevant geometric parameters in the system (the geometric size, period, and incident angle of the hexagonal air hole absorber). Meanwhile, the structure we designed has certain advantages in the field of similar absorber research by briefly calculating related values of sensing performance. The sensitivity of its four resonance peaks are 46.45, 94.35, 151 and 598.9 nm/RIU, and FOM are 5.445, 11.192, 19.895 and 85.680. So we believe that the research has huge application prospects in terms of sensors, tunable spectrum detection, environmental monitoring and medical diagnosis, modulators and optoelectronic device sensors. © 2020 Elsevier B.V.

Number of references: 71

Main heading: Time domain analysis

Controlled terms: Diagnosis - Finite difference time domain method - Graphene - Monolayers - Optoelectronic devices - Phase matching - Resonance

Uncontrolled terms: Application prospect - Coupled-mode theory - Environmental Monitoring - Hexagonal air holes - Phase matching conditions - Reflection efficiency - Resonance wavelengths - Sensing performance

Classification code: 461.6 Medicine and Pharmacology - 713 Electronic Circuits - 741.3 Optical Devices and Systems - 761 Nanotechnology - 804 Chemical Products Generally - 921 Mathematics - 931.1 Mechanics

Numerical data indexing: Percentage 1.00e+02%, Percentage 9.53e+01%, Percentage 9.59e+01%, Percentage 9.74e+01%, Percentage 9.98e+01%, Size 1.09e-06m, Size 1.13e-06m, Size 1.19e-06m, Size 1.37e-06m

DOI: 10.1016/j.diamond.2020.108227

Funding Details: Number: 2020YJ0137, 2020YFG0467, Acronym: SPDST, Sponsor: Department of Science and Technology of Sichuan Province; Number: CX20-031, Acronym: -, Sponsor: -; Number: 18ycx034, JZ20-025, Acronym: SWUST, Sponsor: Southwest University of Science and Technology; Number: 61705204, 11604311, 21506257, 51606158, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: The authors are grateful to the support by National Natural Science Foundation of China (No. 51606158, 11604311, 61705204, 21506257); the Funded by the Scientific Research Fund of Sichuan Provincial Department of Science and Technology (2020YJ0137; 2020YFG0467); the Funded by the Undergraduate Innovation Fund Project Precision Funding by Southwest University of Science and Technology (No. JZ20-025); the Postgraduate Innovation Fund Project by Southwest University of Science and Technology (No. 18ycx034); the Funded by Southwest University of Science and Technology Students Innovation Fund project (No. CX20-031).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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19. Concentration-dependent structure of mixed (NH₄)₂SO₄ and K₂SO₄ aqueous solutions using the X-ray diffraction, Raman spectroscopy and molecular dynamics simulations

Accession number: 20213510837620

Authors: Zhu, Hanyu (1, 2, 3); Zhuang, Xinming (4); Meng, Xianze (5); Wang, Meiling (1, 2, 3); Wang, Xuyang (1, 2, 3); Li, Fei (1, 2, 3); Yuan, Junsheng (1, 2, 3, 4)

Author affiliation: (1) Engineering Research Center of Seawater Utilization of Ministry of Education, School of Chemical Engineering and Technology, Hebei University of Technology, Tianjin; 300130, China; (2) Hebei Collaborative Innovation Center of Modern Marine Chemical Technology, Tianjin; 300130, China; (3) National-Local Joint Engineering Laboratory of Chemical Energy Saving Process Integration and Resource Utilization, School of Chemical Engineering and Technology, Hebei University of Technology, Tianjin; 300130, China; (4) College of Chemical Engineering, Quanzhou Normal University, Quanzhou; 362000, China; (5) School of Materials, Sun Yat-sen University, Guangzhou; 511400, China

Corresponding author: Yuan, Junsheng(jsyuan2012@126.com)

Source title: Vibrational Spectroscopy

Abbreviated source title: Vib. Spectrosc.

Volume: 116

Issue date: September 2021

Publication year: 2021

Article number: 103292

Language: English

ISSN: 09242031

CODEN: VISPEK

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: In the production of potassium sulfate by ammonium sulfate, the purity of potassium sulfate product is relatively low due to the presence of potassium sulfate and ammonium sulfate solid solution. The microstructure of mixed aqueous solution of potassium sulfate and ammonium sulfate have been studied by X-ray diffraction, Raman spectroscopy and molecular dynamics simulation. And the molality of SO_4^{2-} in the solution remained unchanged, and the molality of K^+ and NH_4^+ were changed respectively. Reduced structure function $[F(Q)]$, reduced pair distribution function $[G(r)]$, excess Raman spectroscopy, radial distribution function (RDF), and structure of hydrogen bond network were obtained. With the decrease of K^+ concentration and the increase of NH_4^+ concentration, a variety of new ion contact pairs were formed in the solution. The original hydrogen bond network is disrupted, and the cations would rebuild the hydrogen bond in the solution. When the NH_4^+ replaces the K^+ , the destruction to the hydrogen bond network is reduced. The addition of NH_4^+ might weaken the interaction between water molecules and anions, and exceed a certain critical concentration of $0.8 \text{ mol}\cdot\text{L}^{-1}$, NH_4^+ could promote the interaction between water molecules and anions. Moreover, the experimental results are in good agreement with the simulation results. This article provides certain theoretical guidance for its separation by studying the microstructure of its mixed solution. © 2021

Number of references: 40

Main heading: Molecular dynamics

Controlled terms: Distribution functions - Hydrogen bonds - Ions - Microstructure - Molecules - Nitrogen compounds - Potash - Raman spectroscopy - Sulfur compounds - X ray diffraction

Uncontrolled terms: Concentration-dependent - Critical concentration - Hydrogen bond networks - Molecular dynamics simulations - Pair distribution functions - Potassium sulfate - Radial distribution functions - Structure functions

Classification code: 801.4 Physical Chemistry - 804.2 Inorganic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 951 Materials Science

Numerical data indexing: Molar_Concentration $8.00\text{e}+02\text{mol}/\text{m}^3$

DOI: 10.1016/j.vibspec.2021.103292

Funding text: This research work was supported by National Key Research and Development Plan (2016YFB0600504), Natural Science Fund of Hebei Province (B2017202246, E2020202020), Higher Education Youth Science and Technology Research Fund of Hebei Province (QN2019048), Ministry of education innovation team development plan (IRT14R14), Hebei Modern Marine Chemical Technology Collaborative Innovation Center (jijiao [2013] No. 37) Quanzhou science and technology plan project (2019C107) and the Fundamental Research Funds for the Central Universities, Sun Yat-sen University (76180-31610012). The authors thank for the beamline BL14B and BL13W1 (Shanghai Synchrotron Radiation Facility) for providing helps during experiments.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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20. Ultra-wideband and wide-angle perfect solar energy absorber based on Ti nanorings surface plasmon resonance

Accession number: 20213310787743

Authors: Zhou, Fengqi (1); Qin, Feng (2); Yi, Zao (1, 2); Yao, Weitang (3); Liu, Zhimin (1); Wu, Xianwen (4); Wu, Pinghui (5)

Author affiliation: (1) School of Science, East China Jiaotong University, Nanchang; 330013, China; (2) Joint Laboratory for Extreme Conditions Matter Properties, Southwest University of Science and Technology, Mianyang; 621010, China; (3) School of Mechanical Engineering, Chengdu University, Chengdu; 610106, China; (4) School of Chemistry and Chemical Engineering, Jishou University, Jishou; 416000, China; (5) China College of Physics and Information Engineering, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Liu, Zhimin(Liuzhimin2006@163.com); Yi, Zao(yizaomy@swust.edu.cn)

Source title: Physical Chemistry Chemical Physics

Abbreviated source title: Phys. Chem. Chem. Phys.

Volume: 23

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Issue date: August 21, 2021

Publication year: 2021

Pages: 17041-17048

Language: English

ISSN: 14639076

CODEN: PPCPFQ

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: Solar energy absorption is a very important field in photonics. The successful development of an efficient, wide-band solar absorber is an extremely powerful driver in this field. We propose an ultra-wideband (UWB) solar energy absorber composed of a Ti ring and SiO₂-Si₃N₄-Ti thin films. In the range of 300-4000 nm, the wide band has an absorption efficiency of more than 90% and can reach 3683 nm, and it has four absorption peaks with a high absorptivity. Moreover, the weighted average absorption efficiency of the solar absorber under AM 1.5 is maintained above 97.03%, which indicates it has great potential for use in the field of solar energy absorption. Moreover, we proved that the polarization is insensitive by analyzing the absorption characteristics at arbitrary polarization angles. For both the transverse electric (TE) and transverse magnetic (TM) modes, the UWB absorption is maintained at more than 90% in the wide incidence angle range of 60°. The UWB solar energy absorber has great potential for use in a variety of applications, such as converting solar light and heat into electricity for public use and reducing the side effects of coal-fired power generation. It can also be used in information detection and infrared thermal imaging owing to its UWB characteristics. This journal is © the Owner Societies.

Number of references: 55

Main heading: Ultra-wideband (UWB)

Controlled terms: Coal industry - Energy absorption - Infrared imaging - Plasmons - Polarization - Silica - Silicon - Solar absorbers - Solar energy - Solar power generation - Surface plasmon resonance - Titanium

Uncontrolled terms: Absorption characteristics - Absorption efficiency - Arbitrary polarization - Coal-fired power generation - Information detection - Infrared thermal imaging - Transverse electric - Transverse magnetic modes

Classification code: 503 Mines and Mining, Coal - 524 Solid Fuels - 542.3 Titanium and Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 615.2 Solar Power - 657.1 Solar Energy and Phenomena - 716.3 Radio Systems and Equipment - 746 Imaging Techniques - 931.3 Atomic and Molecular Physics

Numerical data indexing: Percentage 9.00e+01%, Percentage 9.70e+01%, Size 3.00e-07m to 4.00e-06m, Size 3.68e-06m

DOI: 10.1039/d1cp03036a

Funding Details: Number: 51606158, Acronym: -, Sponsor: National Natural Science Foundation of China;

Funding text: The authors are grateful for support from the National Natural Science Foundation of China (No. 51606158, 11604311); funding from the Scientific Research Fund of Si Chuan Provincial Science and Technology Department (2020YJ0137; 2020YFG0467; 2021JDRC0019); the Open Fund of The Key Laboratory for Metallurgical Equipment and Control Technology of Ministry of Education in Wuhan University of Science and Technology (No. MECOF2020B02); the Undergraduate Innovation Fund Project Precision Funding by Southwest University of Science and Technology (No. JZ20-025); the Postgraduate Innovation Fund Project by Southwest University of Science and Technology (No. 18ycx034); and the Southwest University of Science and Technology Students Innovation Fund project (No. CX20-031).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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21. Comparison of the airflow characteristics and yarn properties between conventional and dual-feed-opening rotor spinning units

Accession number: 20213610859784

Authors: Shi, Qianqian (1, 2); Wang, Jiang (1); Zhang, Yuze (1); Ding, Qian (1); Akankwasa, Nicholas Tayari (1); Lin, Huiting (3); Wang, Jun (1, 2)

Author affiliation: (1) College of Textiles, Donghua University, China; (2) Key Laboratory of Textile Science & Technology of Ministry of Education, College of Textiles, Donghua University, China; (3) College of Textile and Fashion, Quanzhou Normal University, China

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Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Article in Press

Publisher: SAGE Publications Ltd

Abstract: In order to explore the differences between conventional and dual-feed-opening rotor spinning units (RSUs), this work compares the airflow characteristics of two RSU models utilizing a computational fluid dynamics simulation model with the accuracy verified by airflow behavior observation and air pressure measurement. The effect of two different opening roller speeds on the airflow field distribution of a dual-feed-opening model is also investigated. In addition, the yarn properties of six pure and blended yarns corresponding to the two RSU models are evaluated. The results reveal that the distributions of airflow velocity vector and air pressure in the two RSU models show a strong similarity under the same boundary conditions. However, the dual-feed-opening model possesses a centrosymmetric and more balanced airflow field distribution compared to the conventional model. In addition, the dual-feed-opening yarns show a superior performance in comparison to the conventional yarns. Furthermore, for the dual-feed-opening model, there are equivalent contributions of two separated opening and fiber transmission systems to the airflow field distribution and yarn formation. Compared to the configuration with the same two opening roller speeds, the dual-feed-opening model configured with two different opening roller speeds obtains an improved blended yarn performance with having few effects on the airflow characteristics. This strength of the dual-feed-opening RSU could facilitate the production of blended and fancy yarns employing the fibers with diverse properties. This study could provide some guidelines for the manufacture of rotor-spun yarns and the future design of RSUs. © The Author(s) 2021.

Number of references: 25

Main heading: Spinning (fibers)

Controlled terms: Air - Atmospheric pressure - Computational fluid dynamics - Rollers (machine components) - Wool - Yarn

Uncontrolled terms: Air flow fields - Air flow velocity - Airflow characteristics - Behavior observation - Computational fluid dynamics simulations - Conventional modeling - Diverse properties - Fiber transmission systems

Classification code: 443.1 Atmospheric Properties - 601.2 Machine Components - 723.5 Computer Applications - 804 Chemical Products Generally - 819.3 Fiber Chemistry and Processing - 819.4 Fiber Products - 821.4 Agricultural Products

DOI: 10.1177/00405175211041721

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

22. L-Histidine improves solubility and emulsifying properties of soy proteins under various ionic strengths ([Open Access](#))

Accession number: 20213610866496

Authors: Wang, Yaosong (1); Ma, Tianyi (1); Liu, Changqi (2); Guo, Fengxian (3); Zhao, Jing (4)

Author affiliation: (1) Department of Food Science and Engineering, College of Light Industry and Food Engineering, Nanjing Forestry University, Nanjing; 210037, China; (2) School of Exercise and Nutritional Sciences, San Diego State University, San Diego; CA; 92182, United States; (3) Fujian Province Key Laboratory for Development of Bioactive Material from Marine Algae, College of Oceanology and Food Science, Quanzhou Normal University, Quanzhou; 362000, China; (4) School of Kinesiology, Nutrition, and Food Science, California State University, Los Angeles; CA; 90032, United States

Corresponding author: Zhao, Jing(jzhao30@calstatela.edu)

Source title: LWT

Abbreviated source title: LWT

Volume: 152

Issue date: December 2021

Publication year: 2021

Article number: 112382

Language: English

ISSN: 00236438

CODEN: LBWTAP

Document type: Journal article (JA)

Publisher: Academic Press

Abstract: Soy protein is a commonly used functional ingredient. Despite its versatility, modifications of soy proteins could further enhance its functionalities. The objective of this study is to investigate the effect of L-histidine on physicochemical and functional properties of soy protein isolate (SPI) in the presence of 0, 0.1, and 0.6 M NaCl. The

incorporation of L-histidine improved SPI solubility and decreased turbidity regardless of the salt concentrations. Notably, at 0.1 M NaCl, the incorporation of 0.3% L-histidine more than doubled the SPI solubility. Reactive sulfhydryl groups and surface hydrophobicity of the SPI decreased up to 24.2% and 38.6%, respectively, by the L-histidine treatment. The SPI-histidine interactions facilitated exposure of tryptophan residues in the absence of salt while mitigated salt-induced protein unfolding. With no salt, 0.3% L-histidine improved the emulsifying activity and stability of the SPI by 11.5% and 9.2%, respectively. At 0.1 M NaCl, 0.3% L-histidine did not improve the emulsifying activity but increased the emulsion stability by 30.1%. At 0.6 M NaCl, 0.3% L-histidine induced a 25.4% increase in emulsifying activity while no change in emulsion stability. In conclusion, L-histidine can be used as a functional ingredient to enhance the performance of SPI in various food formulations. © 2021 The Authors

Number of references: 31

Main heading: Sodium chloride

Controlled terms: Amino acids - Emulsification - Hydrophobicity - Ionic strength - Physicochemical properties - Proteins - Solubility

Uncontrolled terms: Basic amino acids - Emulsifying activity - Emulsion stability - Functional ingredient - Functional properties - L-histidine - Soy protein - Soy protein isolates - Sulfhydryl groups - Surface hydrophobicity

Classification code: 801.4 Physical Chemistry - 802.3 Chemical Operations - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids

Numerical data indexing: Percentage 1.15E+01%, Percentage 2.42E+01%, Percentage 2.54E+01%, Percentage 3.00E-01%, Percentage 3.01E+01%, Percentage 3.86E+01%, Percentage 9.20E+00%

DOI: 10.1016/j.lwt.2021.112382

Funding Details: Number: 31401530,32001746, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China; Number: 2018J05064, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province;

Funding text: This research was supported by the National Natural Science Foundation of China (Grant No. 32001746 and No. 31401530) and Natural Science Foundation of Fujian Province (No. 2018J05064).

Compendex references: YES

Open Access type(s): All Open Access, Hybrid Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

23. A scalable distributed parallel simulation tool for the SWAT model

Accession number: 20212910653951

Authors: Lin, Qiaoying (1); Zhang, Dejian (2, 3)

Author affiliation: (1) Department of Resources and Environmental Sciences, Quanzhou Normal University, Donghai Street 398, Quanzhou; Fujian; 362000, China; (2) College of Computer and Information Engineering, Xiamen University of Technology, Ligong Road 600, Xiamen; Fujian; 361024, China; (3) Digital Fujian Institute of Big Data for Natural Hazards Monitor, Ligong Road 600, Xiamen; Fujian; 361024, China

Corresponding author: Zhang, Dejian(zhangdejian@xmut.edu.cn)

Source title: Environmental Modelling and Software

Abbreviated source title: Environ. Model. Softw.

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Issue date: October 2021

Publication year: 2021

Article number: 105133

Language: English

ISSN: 13648152

CODEN: EMSOFT

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: High-fidelity hydrological models are increasingly built and used to investigate the effects of management activities and climate change on water availability and quality for large areas with datasets of high spatial and temporal resolution. However, these advantages come at the price of greater computational demand and run time. This becomes challenging when modeling routines involve iterative model simulations. In this study, we proposed a generic scheme to reduce the Soil and Water Assessment Tool (SWAT) runtime by decomposing a watershed model into subbasin models and optimizing the subbasin model simulations based on a parallel approach. Based on this scheme, we implemented a generic tool named Spark-SWAT, which allows subbasin models to be simulated in parallel on a Spark computer cluster. We then evaluated Spark-SWAT with two sets of experiments to demonstrate the potential of Spark-SWAT to accelerate single and iterative model simulations. In each test set, Spark-SWAT was applied to simulate 12 synthetic hydrological models in parallel with different I/O (input/output) burdens and river network

complexities in a Spark cluster with five virtual machines. The single model parallelization results showed that Spark-SWAT yielded a speedup value of 7.84 for the most complex model but was less effective with simple models. When applied to use cases with iterative model runs, Spark-SWAT yielded a speedup of 6.55–24.58 depending on the model complexity. These results indicate that the proposed scheme can effectively solve high-computational-demand problems of complex models. As a subbasin-level parallelization tool, Spark-SWAT can be very computationally frugal and useful in use cases in which the model input changes pertain to only a few subbasins because only the changed and downstream subbasins require new computations. Moreover, it is possible to apply this generic method to other subbasin-based hydrological models to alleviate I/O demands and optimize model computational performance. © 2021

Number of references: 40

Main heading: Electric sparks

Controlled terms: Climate change - Cluster computing - Complex networks - Iterative methods - Large dataset - Watersheds

Uncontrolled terms: Computational demands - Generic method - Hydrological models - Input-output - Iterative modeling - Model simulation - Runtimes - Single models - Soil and Water assessment tools - Subbasins

Classification code: 443.1 Atmospheric Properties - 444.1 Surface Water - 701.1 Electricity: Basic Concepts and Phenomena - 722 Computer Systems and Equipment - 722.4 Digital Computers and Systems - 723.2 Data Processing and Image Processing - 921.6 Numerical Methods

DOI: 10.1016/j.envsoft.2021.105133

Funding Details: Number: -, Acronym: AWS, Sponsor: Amazon Web Services; Number: -, Acronym: -, Sponsor: Google; Number: 2020J01779, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: XPDKT19014, Acronym: XMUT, Sponsor: Xiamen University of Technology;

Funding text: To date, many studies have been conducted to accelerate distributed hydrological model simulations through submodel-level parallelization. For example, Wu et al. (2013) developed a parallel version of the SWAT model using the MPI in Microsoft Windows by parallelizing subbasin simulations on different computational cores. Wang et al. (2013) proposed an effective parallel-computing method, named the temporal-spatial discretization method (TSDM), for exploiting the parallelization degree of subbasins to the maximum extent by properly organizing the simulation sequences of dependent subbasins. Liu et al. (2014b) proposed a layered approach and implemented a grid-based fully sequential dependent hydrological model (FSDHM) with OpenMP, and the model can leverage the power of the multicore central processing units (CPUs) of a computer. This model was further extended with the MPI by parallelizing tasks at the subbasin level to different nodes in a computer cluster (Liu et al., 2016). Zhu et al. (2019) introduced an open-source, modular, and parallelized watershed modeling framework called the spatially explicit integrated modeling system (SEIMS) to support model parallelization. Similar to the study of Liu et al. (2016), this framework utilizes both the MPI and OpenMP to achieve submodel parallelization and leverage the computational power of a computer cluster consisting of multiple nodes. Although the aforementioned solutions are effective in solving the highly demanding computational problems of distributed hydrological models, they usually require tight coupling between models and parallel processing or message passing frameworks. The applicability of a model parallelization tool is also influenced by the running environment. As an open-source tool implemented in Java, Spark-SWAT can run on major Oss, such Linux, Unix and Windows. In addition, the use of the Spark framework is sufficiently widespread in the IT industry, and many cloud providers currently offer convenient on-demand managed Spark clusters (e.g., Azure HDinsight, Amazon Web Services EMR, and Google Dataproc) with out-of-the-box support for Spark-based applications. Thus, users can easily adapt Spark-SWAT to run in these environments, which will reduce the technical and financial burdens encountered when building an in-house Spark cluster. This work was financially supported by the Natural Science Foundation of Fujian Province [grant number 2020J01779], the Science and Technology Project of Xiamen [grant number 3502Z20183056], and the Science and Technology Climbing Program of Xiamen University of Technology [grant number XPDKT19014].

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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24. Opportunities and challenges of algal fucoidan for diabetes management

Accession number: 20211410159189

Authors: Wen, Yuxi (1, 2, 5); Gao, Luying (3); Zhou, Hengsheng (6); Ai, Chao (7, 8); Huang, Xiaozhou (5); Wang, Mingfu (9); Zhang, Yuyu (10); Zhao, Chao (1, 2, 4)

Author affiliation: (1) Engineering Research Centre of Fujian-Taiwan Special Marine Food Processing and Nutrition, Ministry of Education, Fuzhou; 350002, China; (2) College of Food Science, Fujian Agriculture and Forestry University, Fuzhou; 350002, China; (3) Department of Pediatrics, Nanjing First Hospital, Nanjing Medical University, Nanjing; 210006, China; (4) Key Laboratory of Marine Biotechnology of Fujian Province, Institute of Oceanology, Fujian Agriculture and Forestry University, Fuzhou; 350002, China; (5) College of Oceanology and Food Science, Quanzhou Normal University, Quanzhou; 362000, China; (6) College of Transportation and Civil Engineering, Fujian Agriculture

and Forestry University, Fuzhou; 350002, China; (7) School of Food Science and Engineering, South China University of Technology, Guangzhou; 510641, China; (8) Department of Food Science & Technology, National University of Singapore, Singapore, 117543, Singapore; (9) Food and Nutrition Department, Providence University, Taichung; 43301, Taiwan; (10) Beijing Key Laboratory of Flavor Chemistry, Beijing Technology and Business University (BTBU), Beijing; 100048, China

Corresponding author: Zhao, Chao(zhchao@live.cn)

Source title: Trends in Food Science and Technology

Abbreviated source title: Trends Food Sci. Technol.

Volume: 111

Issue date: May 2021

Publication year: 2021

Pages: 628-641

Language: English

ISSN: 09242244

CODEN: TFTEEH

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Background: Diabetes mellitus is an endocrine and metabolic system disease characterized by hyperglycaemia and insulin resistance, and has become a prevalent disease around the world. Fucoïdan has a good hypoglycaemic effect and ideal development potential in the treatment of diabetes based on their specific chemical structures, such as monosaccharide compositions and glycosidic linkages. Scope and approach: However, the relationship between structure-function and activity has not yet been clarified. This article discusses the structural characteristics of fucoïdan, including its backbone structure, glycosidic bond positions, monosaccharide types, sulphate content, and molecular weight. The potential therapeutic effect of fucoïdan on hyperglycaemia and diabetic complications caused by diabetes is also reviewed. Key findings and conclusions: Fucoïdan reduces blood sugar levels through α -amylase and α -D-glucosidase inhibition, a Sirt-1-dependent manner, and the cAMP, PI3K/AKT, and JNK/AKT signalling pathways. The outstanding biological function of fucoïdan is due its unique chemical structure. Among them, fucoïdan of low molecular weight and high degree of sulfation displays greater anti-diabetic activity, and persulphated fucoïdan derivatives showed significantly enhanced hypoglycaemic activities. Moreover, only (1,3) and (1,4) alternatively linked fucoïdan showed a stronger inhibitory effect on α -D-glucosidase. © 2021 Elsevier Ltd

Number of references: 104

Main heading: Algae

Controlled terms: Glucose - Molecular weight - Structure (composition) - Sulfur compounds

Uncontrolled terms: Diabetes management - Diabetes mellitus - Endocrine systems - Fucoïdians - Glucosidase - Hyperglycaemia - Hypoglycaemic - Marine algae - Metabolic systems - Structure-function relationship

Classification code: 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics - 951 Materials Science

DOI: 10.1016/j.tifs.2021.03.028

Funding Details: Number: -, Acronym: FAFU, Sponsor: Fujian Agriculture and Forestry University;

Funding text: This work was financially funded by Key Project of the Natural Science Foundation of Fujian Province (2020J02032) and Double First-Class Construction Plan (KSYLX013) of Fujian Agriculture and Forestry University. The project was also supported by Key Laboratory of Marine Biotechnology of Fujian Province (2020MB05) and the Open Project Program of the Key Laboratory of Brewing Molecular Engineering of China Light Industry (BME-202004).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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25. Low-velocity drop weight impact behavior of Twaron® fabric investigated using experimental and numerical simulations

Accession number: 20205109655061

Authors: Huang, Canyi (1, 2); Cui, Lina (1, 2); Liu, Yajun (1); Xia, Hong (3, 4); Qiu, Yiping (5); Ni, Qing-Qing (3, 4)

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Source title: International Journal of Impact Engineering

Abbreviated source title: Int J Impact Eng**Volume:** 149**Issue date:** March 2021**Publication year:** 2021**Article number:** 103796**Language:** English**ISSN:** 0734743X**CODEN:** IJIED4**Document type:** Journal article (JA)**Publisher:** Elsevier Ltd

Abstract: Low-velocity drop weight impact experiments of plain-woven Twaron® CT 612 at an impact energy of 15, 20, 30 J are carried out on a 9250HV drop weight impact tester. Specially treated specimens are designed and used to deal with boundary conditions because the fabric is too flexible and cannot be fixed precisely. Experimental results reaffirm that Twaron is an impact-rate-sensitive material and that a greater initial impact energy resulted in a larger breaking load, greater failure strain, larger energy absorption and shorter contact duration to the fabric in the impact process. The commercial code ANSYS-AUTODYN is employed for impact FE analysis on a physically based impact model which is designed basing on the fabric's geometry parameters and the experimental set-up. The dynamic mechanical parameters of Twaron is analyzed and applied to FE model to describe the rate-sensitive mechanical properties through a three-element spring-dashpot model. Standard earth gravity is applied to the impact model to reflect the impact process realistically as well. The results indicate that a remarkably close agreement is obtained between the simulation and experimental results in various impact scenarios. Thus, the energy absorption mechanisms and stress distributions during the impact process are clarified. The influence of specimen shape and size are also analyzed systemically. These results indicate that the present experimental set-up and the developed fabric geometry model are effective at investigating many additional mechanical problems in textile fabrics and/or flexible material structures. © 2020 Elsevier Ltd

Number of references: 37**Main heading:** Aramid fibers**Controlled terms:** Drops - Energy absorption - Textile industry - Weaving**Uncontrolled terms:** Absorption mechanisms - Drop weight impact - Dynamic mechanical parameters -

Experimental set up - Flexible materials - Geometry parameter - Mechanical problems - Rate sensitive material

Classification code: 819 Synthetic and Natural Fibers; Textile Technology**Numerical data indexing:** Energy 3.00e+01J**DOI:** 10.1016/j.ijimpeng.2020.103796**Compendex references:** YES**Database:** Compendex**Data Provider:** Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

26. Design of the Telecentric Lens for Dual Side Imaging of the Small Size Particles with Equal Optical Path

Accession number: 20213910941218**Authors:** Wang, Xinsen (1); Duan, Yafan (1); Chen, Wenzhi (1); Lin, Nuofei (1); Ding, Jianling (1); Liao, Tingdi (1)**Author affiliation:** (1) Research Center for Photonics Technology, Quanzhou Normal University, Fujian Provincial Key Laboratory for Advanced Micro-Nano Photonics Technology and Devices, Fujian Provincial Collaborative Innovation Center for Ultra-Precision Optical Eng. and Appli., Quanzhou, China**Source title:** 2021 International Conference of Optical Imaging and Measurement, ICOIM 2021**Abbreviated source title:** Int. Conf. Opt. Imaging Meas., ICOIM**Part number:** 1 of 1**Issue title:** 2021 International Conference of Optical Imaging and Measurement, ICOIM 2021**Issue date:** August 27, 2021**Publication year:** 2021**Pages:** 36-40**Language:** English**ISBN-13:** 9780738112121**Document type:** Conference article (CA)**Conference name:** 2021 International Conference of Optical Imaging and Measurement, ICOIM 2021**Conference date:** August 27, 2021 - August 29, 2021**Conference location:** Xi'an, China**Conference code:** 171552

Sponsor: IEEE

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: Due to the industrial automation requirements, a machine vision is widely used in the industrial production and detection. Compared with the traditional artificial, it has the advantages of high speed and high accuracy, especially to the small-size granular products. It is difficult to detect the surfaces of the small-size granular products quickly and accurately by artificial vision due to the limitations of human eyes. Therefore, the machine vision system with large magnification and high resolution often being used. For the products that need to detect multiple surface, it is often necessary to configure multiple sets of machine vision systems, which are very complex. In order to realize the multi-surfaces detection of small-size granular products, a two-sided imaging telecentric optical lens is designed in this paper, which can image the adjacent surfaces of the product simultaneously using one set of machine vision system. The lens consists of five prisms for double-sided image conversion and splitting and six spherical lenses. It has 1 times magnification, high resolution and the telecentricity was less than 0.01° the working distance is 36.84mm. Because there is an inclined angle of the glass wedge in the meridian plane, which makes the meridian plane asymmetric, when the MTF value is 0.3, the Nyquist frequency of the meridian surface is 65 lp/mm, and the Nyquist frequency of the sagittal surface is 125 lp/mm. The maximum distortion of the system is controlled within 0.2%, and it is suitable for 2 / 3 "CCD. Through tolerance analysis, the lens has good tolerance compatibility, high cost performance, and can be mass produced. © 2021 IEEE.

Number of references: 10

Main heading: Computer vision

Controlled terms: Fits and tolerances - Lenses - Optical systems - Particle size analysis

Uncontrolled terms: Confocal imaging - Double sided - Double sided confocal imaging - Granular products - High resolution - Machine vision systems - Meridian planes - Nyquist frequency - Optical system designs - Telecentric lens

Classification code: 723.5 Computer Applications - 741.2 Vision - 741.3 Optical Devices and Systems - 951 Materials Science

Numerical data indexing: Percentage 2.00E-01%, Size 3.684E-02m

DOI: 10.1109/ICOIM52180.2021.9524371

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

27. Secure and efficient data storage and sharing scheme based on double blockchain (Open Access)

Accession number: 20204809532820

Authors: Zhang, Lejun (1, 2); Peng, Minghui (1); Wang, Weizheng (3); Su, Yansen (4); Cui, Shuna (5, 6); Kim, Seokhoon (7)

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Source title: Computers, Materials and Continua

Abbreviated source title: Comput. Mater. Continua

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Publication year: 2021

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Language: English

ISSN: 15462218

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Document type: Journal article (JA)

Publisher: Tech Science Press

Abstract: In the digital era, electronic medical record (EMR) has been a major way for hospitals to store patients' medical data. The traditional centralized medical system and semi-trusted cloud storage are difficult to achieve

dynamic balance between privacy protection and data sharing. The storage capacity of blockchain is limited and single blockchain schemes have poor scalability and low throughput. To address these issues, we propose a secure and efficient medical data storage and sharing scheme based on double blockchain. In our scheme, we encrypt the original EMR and store it in the cloud. The storage blockchain stores the index of the complete EMR, and the shared blockchain stores the index of the shared part of the EMR. Users with different attributes can make requests to different blockchains to share different parts according to their own permissions. Through experiments, it was found that cloud storage combined with blockchain not only solved the problem of limited storage capacity of blockchain, but also greatly reduced the risk of leakage of the original EMR. Content Extraction Signature (CES) combined with the double blockchain technology realized the separation of the privacy part and the shared part of the original EMR. The symmetric encryption technology combined with Ciphertext-Policy Attribute-Based Encryption (CP-ABE) not only ensures the safe storage of data in the cloud, but also achieves the consistency and convenience of data update, avoiding redundant backup of data. Safety analysis and performance analysis verified the feasibility and effectiveness of our scheme. © 2020 Tech Science Press. All rights reserved.

Number of references: 30

Main heading: Data Sharing

Controlled terms: Blockchain - Cryptography - Data privacy - Digital storage - Medical computing

Uncontrolled terms: Ciphertext-policy attribute-based encryptions - Content extraction - Electronic medical record - Performance analysis - Privacy protection - Safety analysis - Storage capacity - Symmetric encryption

Classification code: 461.1 Biomedical Engineering - 722.1 Data Storage, Equipment and Techniques

DOI: 10.32604/cmc.2020.012205

Funding Details: Number: LC2016024, Acronym: -, Sponsor: Natural Science Foundation of Heilongjiang Province;

Number: -, Acronym: -, Sponsor: Six Talent Peaks Project in Jiangsu Province; Number: 17KJB520044, Acronym: -, Sponsor: Natural Science Research of Jiangsu Higher Education Institutions of China;

Funding text: Funding Statement: This work is sponsored by the Natural Science Foundation of Heilongjiang Province of China under Grant No. LC2016024. Natural Science Foundation of the Jiangsu Higher Education Institutions Grant No. 17KJB520044 and Six Talent Peaks Project in Jiangsu Province No. XYDXX-108.

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

28. Dual-phase nanostructuring as a route to flexible nanoporous metals with outstanding comprehensive mechanical properties (Open Access)

Accession number: 20211110087608

Title of translation:

Authors: Wang, Chaoyang (1); Li, Zhangyi (1); Zhu, Shengli (1, 2, 4); Liang, Yanqin (1, 2); Cui, Zhenduo (1); Wu, Shuilin (1, 2); Qin, Chunling (3); Luo, Shuiyuan (4); Inoue, Akihisa (1, 5)

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Source title: Science China Materials

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Publication year: 2021

Pages: 2289-2304

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E-ISSN: 21994501

Document type: Journal article (JA)

Publisher: Science in China Press

Abstract: The mechanical properties of nanoporous metals (NPMs) are very important for their potential applications in flexible electronics. Here, the NP Cu@Zr-Cu-Al metallic glass (NP Cu@Zr-Cu-Al MG) composite with high strength, high hardness, and good flexibility is reported. The NP Cu@Zr-Cu-Al MG was synthesized by a two-step

dealloying method. First, the flexible NP Zr-Cu-Al MG was prepared by selective etching the active Y-rich MG from the pseudobinary MG system (Zr₄₇Cu₄₆Al₇ MG + Y₄₇Cu₄₆Al₇ MG) of Cu₄₆Zr_{23.5}-Y_{23.5}Al₇ alloy. The NP Cu@Zr-Cu-Al MG was then obtained by further etching the NP Zr-Cu-Al MG and the Cu layer was evenly covered on the MG matrix of ligaments. The NP Cu@Zr-Cu-Al MG demonstrated good flexibility due to its non-cracking structure and the existence of flexible Zr-Cu-Al MG. Additionally, the NP Cu@Zr-Cu-Al MG showed the highest tensile strength of 143.9 MPa and nanohardness of 0.79 GPa among all the reported NPMs. The Zr-Cu-Al MG strengthening phase weakened the rupture of Cu@Zr-Cu-Al ligaments, which could effectively restrain the crack initiation and propagation in the NP Cu@Zr-Cu-Al MG. Finally, it could improve the comprehensive mechanical properties. The NP Cu@Zr-Cu-Al MG was applied as an electrode for supercapacitors and glucose biosensors. The NP Cu@Zr-Cu-Al MG electrode displayed better conductivity and supercapacitor capacitance than the bare NP Zr-Cu-Al MG electrode. © 2021, Science China Press and Springer-Verlag GmbH Germany, part of Springer Nature.

Number of references: 61

Main heading: Aluminum alloys

Controlled terms: Cracks - Dealloying - Electrodes - Etching - Flexible electronics - Glucose sensors - Metallic glass - Nanostructured materials - Supercapacitor - Tensile strength - Zircaloy

Uncontrolled terms: Crack initiation and propagation - Glucose biosensor - High strength - Nano-structuring - Nanoporous metals - Pseudo-binaries - Selective etching - Strengthening phase

Classification code: 462.1 Biomedical Equipment, General - 531 Metallurgy and Metallography - 541.2 Aluminum Alloys - 715 Electronic Equipment, General Purpose and Industrial - 761 Nanotechnology - 802.2 Chemical Reactions

Numerical data indexing: Pressure 1.44e+08Pa, Pressure 7.90e+08Pa

DOI: 10.1007/s40843-020-1606-4

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Number: WQ20121200052, Acronym: -, Sponsor: Recruitment Program of Global Experts;

Funding text: This work was financially supported by the National Natural Science Foundation of China (51771131) and the Recruitment Program of Global Experts '1000 Talents Plan' of China (WQ20121200052).

Compendex references: YES

Open Access type(s): All Open Access, Bronze

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

29. Secure and efficient data storage and sharing scheme for blockchain-based mobile-edge computing

Accession number: 20212310458979

Authors: Zhang, Lejun (1, 2); Peng, Minghui (1); Wang, Weizheng (3); Jin, Zilong (4); Su, Yansen (5); Chen, Huiling (6)

Author affiliation: (1) College of Information Engineering, Yangzhou University, Yangzhou, China; (2) School of Mathematics & Computer Science, Quanzhou Normal University, Quanzhou, China; (3) Computer Science Department, City University of Hong Kong, Hong Kong, Hong Kong; (4) School of Computer and Software, Nanjing University of Information Science and Technology, Nanjing, China; (5) Key Laboratory of Intelligent Computing and Signal Processing of Ministry of Education, School of Computer Science and Technology, Anhui University, Hefei, China; (6) Department of Computer Science and Artificial Intelligence, Wenzhou University, Wenzhou, China

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Source title: Transactions on Emerging Telecommunications Technologies

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Publication year: 2021

Article number: e4315

Language: English

ISSN: 21615748

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Document type: Journal article (JA)

Publisher: John Wiley and Sons Inc

Abstract: With the rapid development of Internet of Things (IoT) technology, IoT devices have been widely used to collect physiological health data and provide diversified services to the terminal users. However, traditional data storage and sharing scheme cloud computing based in IoT face many challenges. For example, IoT devices are usually resource-constrained (storage, computing power, battery capacity, etc.), data signed by IoT devices to ensure

data integrity and authenticity will consume a lot of computing resources of IoT devices. At the same time, there is the challenge of high latency and unsafe data storage and sharing. To overcome these challenges, we propose a secure and efficient data storage and sharing scheme for blockchain-based mobile-edge computing. In our scheme, we construct the unique signature private key in a region into multiple key shares. IoT devices only need to submit the data and the random key shares allocated to the edge node. Edge node uses the recovered signature private key to realize data signature and homomorphic encryption. At the same time, the edge node will process timely data and return to the user. For data that need to be uploaded to the cloud for analysis, we use backup uploads to avoid data floods. Through experiments, it was found that our scheme can not only realize low-latency message response for the terminal users, but also realize anonymous identity verification while ensuring data integrity and authenticity. The key shares of the signature private key are stored in different blocks of the blockchain to improve fault tolerance. The content extraction signature algorithm ensures that the key shares stored in different blocks are publicly verifiable. Safety analysis and performance analysis verify the feasibility and effectiveness of our scheme. © 2021 John Wiley & Sons, Ltd.

Number of references: 30

Main heading: Internet of things

Controlled terms: Authentication - Blockchain - Cryptography - Digital storage - Edge computing - Fault tolerance - Storage as a service (STaaS)

Uncontrolled terms: Computing resource - Content extraction - Ho-momorphic encryptions - Identity verification - Internet of Things (IOT) - Performance analysis - Publicly verifiable - Signature algorithms

Classification code: 722.1 Data Storage, Equipment and Techniques - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications

DOI: 10.1002/ett.4315

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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30. Biomimetic and responsive nanoparticles loading JQ1 for dual-targeting treatment of vascular restenosis via multiple actions

Accession number: 20214611150690

Authors: Hao, Xuefang (1); Gai, Weiwei (1); Ji, Feng (6); Wang, Lina (1); Zhao, Jiadi (1); Yang, Fan (1); Jiang, Haixia (2); Feng, Yakai (3, 4, 5)

Author affiliation: (1) Nano Innovation Institute, Inner Mongolia Key Lab of Carbon Nanomaterials, College of Chemistry and Materials Science, Inner Mongolia University for Nationalities, Tongliao; 028000, China; (2) Analysis and Testing Center of Inner, Mongolia University for Nationalities, Tongliao; 028000, China; (3) School of Chemical Engineering and Technology, Tianjin University, Yaguan Road 135, Tianjin; 300350, China; (4) Collaborative Innovation Center of Chemical Science and Chemical Engineering (Tianjin), Tianjin; 300350, China; (5) Key Laboratory of Systems Bioengineering (Ministry of Education), Tianjin University, Tianjin; 300072, China; (6) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Hao, Xuefang(hxf15175374404@126.com)

Source title: Chemical Engineering Journal

Abbreviated source title: Chem. Eng. J.

Issue date: 2021

Publication year: 2021

Article number: 133452

Language: English

ISSN: 13858947

CODEN: CMEJAJ

Document type: Article in Press

Publisher: Elsevier B.V.

Abstract: Postoperative restenosis remains the key problem of coronary arterial disease and seriously threatens human health. Currently, no effective strategies can thoroughly prevent restenosis owing to its complicated progression. We hypothesize the multi-effect drug of endothelium-protective epigenetic inhibitor (JQ1) may act well in anti-restenosis via exerting multiple functions and acting on different cells. Furthermore, homing to endothelium injured site and pH-triggered drug release can enhance targeted therapeutic efficacy by JQ1 preferential accumulation at injured site and in vascular smooth muscle cells (VSMCs). To verify our hypothesis and develop targeted drug delivery system (DDS) with controlled release ability for anti-restenosis, a pH-responsive nanoparticle was prepared to encapsulate JQ1 and further camouflaged by platelet membrane (PM). The resulting biomimetic and responsive DDS showed optimized drug release behavior and rapid homing to injured site. Moreover, the internalization of DDS in VSMCs was much higher than other groups without PM, which indicated that it inherited natural specificity for

VSMCs from PM and obtained dual-targeting function to enhance therapeutic efficacy. The DDS presented significant anti-inflammatory effect via inhibiting NF- κ B signaling pathway and secretion of pro-inflammatory cytokines from macrophages. Besides, VSMCs proliferation was suppressed by the DDS with little effect on vascular endothelial cell proliferation and in vivo re-endothelialization at suitable JQ1 concentration. More importantly, the DDS substantially inhibited intima hyperplasia without obvious pathological variation on main organs using a mouse model of carotid artery injury. In summary, we created a versatile DDS for the promotion of JQ1 targeting delivery and responsive release at injured site to mitigate restenosis. The DDS demonstrated outstanding performance via a synergistic and comprehensive effect of multiple factors for anti-restenosis, providing a promising method for clinical applications. © 2021 Elsevier B.V.

Number of references: 68

Main heading: Diseases

Controlled terms: Biomimetics - Cell proliferation - Controlled drug delivery - Endothelial cells - Muscle - Nanoparticles - Platelets - Targeted drug delivery

Uncontrolled terms: Drug-delivery systems - Nanoparticle - Nanoparticle loadings - pH responsibilities - Platelet membrane - Platelet membranes - Proliferation - Restenosis - Therapeutic efficacy - Vascular Smooth Muscle Cells

Classification code: 461.2 Biological Materials and Tissue Engineering - 461.8 Biotechnology - 461.9 Biology - 761 Nanotechnology - 933 Solid State Physics

DOI: 10.1016/j.ccej.2021.133452

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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31. Formation, microstructure and mechanical properties of ductile Zr-rich Zr–Cu–Al bulk metallic glass composites (Open Access)

Accession number: 20214711200681

Authors: Ding, J. (1); Inoue, A. (1, 2, 3, 4, 5); Zhu, S.L. (1, 6, 7); Wu, S.L. (1); Shalaan, E. (4); Al-Ghamdi, A.A. (4)

Author affiliation: (1) School of Materials Science and Engineering, Tianjin University, Tianjin; 300072, China; (2) International Institute of Green Materials, Josai International University, Togane; 283-8555, Japan; (3) Institute of Massive Amorphous Alloy Science, China University of Mining Technology, Xuzhou; 221116, China; (4) Department of Physics, King Abdulaziz University, Jeddah; 22254, Saudi Arabia; (5) MISiS, National University of Science and Technology, Moscow; 119049, Russia; (6) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (7) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; Fujian; 362000, China

Corresponding authors: Zhu, S.L.(slzhu@tju.edu.cn); Inoue, A.(inoue@jiu.ac.jp)

Source title: Journal of Materials Research and Technology

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Volume: 15

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Publication year: 2021

Pages: 5452-5465

Language: English

ISSN: 22387854

Document type: Journal article (JA)

Publisher: Elsevier Editora Ltda

Abstract: We examined the microstructure, phase stability, mechanical properties and deformation behaviors of cast (Zr_{0.58}Cu_{0.42})_{100-x}Al_x (x = 0, 3, 5, 7, 10) bulk metallic glass composites (BMGCs). With increasing Al content, the glass-forming ability of the new Zr-rich Zr–Cu–Al alloys gradually increases, enabling the fabrication of BMGCs for the alloys containing more than 3 at.% Al. The as-cast structure changes from Cu₁₀Zr₇ + CuZr₂ for the Al-free base alloy to glass + crystal for the Al-added alloys. The new Zr-rich Zr–Cu–Al BMGCs exhibit a large fracture strain of #3.4–7.8% and a high fracture strength of #1731–1984 MPa under compression. The compressive fracture strain of Zr-rich Zr–Cu–Al alloys can be explained by the percolation theory. The (Zr_{0.58}Cu_{0.42})₉₅Al₅ composite containing

~70 vol.% crystalline phase possesses the largest plastic strain of ~6%, and fracture strength of over 1900 MPa under compressive condition. The superior plastic deformation capability under compression is related to the following factors: (1) The formation of three types of shear bands with distinct morphological characteristics, (2) the plastic deformation of B2–CuZr phase itself, together with stress-induced martensitic transformation from B2–CuZr phase to B19' phase, and (3) the interaction between crystals and shear bands. The present results have implications for better understanding the deformation mechanisms of the Zr-rich Zr–Cu–Al BMGCs and for designing high-performance BMGCs with enhanced plasticity. © 2021 The Authors

Number of references: 55

Main heading: Glass

Controlled terms: Aluminum alloys - Binary alloys - Composite materials - Copper alloys - Crystal structure - Fracture - Martensitic transformations - Metallic glass - Microstructure - Plastic deformation - Solvents - Zircaloy

Uncontrolled terms: Al content - As-cast structures - Bulk metallic glass composites - Cu-Al alloys - Deformation behavior - Fracture strain - Glass-forming ability - Mechanical deformation - Microstructures and mechanical properties - Structure change

Classification code: 531 Metallurgy and Metallography - 531.2 Metallography - 541.2 Aluminum Alloys - 544.2 Copper Alloys - 803 Chemical Agents and Basic Industrial Chemicals - 812.3 Glass - 933.1.1 Crystal Lattice - 951 Materials Science

Numerical data indexing: Percentage 3.40E+00% to 7.80E+00%, Percentage 6.00E+00%, Pressure 1.731E+09Pa to 1.984E+09Pa, Pressure 1.90E+09Pa

DOI: 10.1016/j.jmrt.2021.11.019

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: K2-2019-002, Acronym: HUST, Sponsor: Henan University of Science and Technology; Number: -, Acronym: Minobrnauka, Sponsor: Ministry of Education and Science of the Russian Federation; Number: FP-076-43, Acronym: KAU, Sponsor: King Abdulaziz University; Number: WQ20121200052, Acronym: -, Sponsor: Recruitment Program of Global Experts; Number: -, Acronym: -, Sponsor: Deanship of Scientific Research, King Saud University;

Funding text: The authors are grateful for support from the Recruitment Program of Global Experts "1000 Talents Plan" (WQ20121200052), the National Natural Science Foundation of China (51771131), the Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah, Saudi Arabia funded this project, under Grant No. (FP-076-43), and the Ministry of Education and Science of the Russian Federation in the framework of the program aimed to increase the competitiveness of the National University of Science and Technology "MISiS" (Grant No. K2-2019-002). r. The authors are grateful for support from the Recruitment Program of Global Experts ?1000 Talents Plan? (WQ20121200052), the National Natural Science Foundation of China (51771131), the Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah, Saudi Arabia funded this project, under Grant No. (FP-076-43), and the Ministry of Education and Science of the Russian Federation in the framework of the program aimed to increase the competitiveness of the National University of Science and Technology ?MISiS? (Grant No. K2-2019-002). r.

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

32. Antibacterial Vitamin K3 Carnosine Peptide-Laden Silk Fibroin Electrospun Fibers for Improvement of Skin Wound Healing in Diabetic Rats

Accession number: 20212610569110

Authors: Kandhasamy, Subramani (1); Liang, Bo (2); Yang, Da-Peng (3); Zeng, Yiming (1)

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Source title: ACS Applied Bio Materials

Abbreviated source title: ACS Appl. Bio Mater.

Volume: 4

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Issue date: June 21, 2021

Publication year: 2021

Pages: 4769-4788

Language: English

E-ISSN: 25766422

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: The utilization of a multifunctional bioactive molecule functionalized electrospun dressing in tissue repair and regenerative function is a prominent therapeutic strategy for preparing efficient biomaterials to promote chronic wound healing. Designing robust and highly efficient antibacterial agents in resistance against microbes and bacterial infections is a key challenge for accelerating diabetic wound healing until today. In this study, we developed a vitamin K3 carnosine peptide (VKC)-laden silk fibroin electrospun scaffold (SF-VKC) for diabetic wound healing. The structural confirmation of synthesized VKC was characterized by ¹H NMR, ¹³C NMR, electrospray ionization mass spectrometry (ESI-MS), and attenuated total reflection Fourier transform infrared (ATR-FTIR) spectroscopy analysis, and the cell viability of VKC was evaluated by the CCK-8 assay in HFF1 and NIH 3T3 cells. VKC shows excellent cell viability on both cell lines, and the VKC and SF-VKC electrospun mats exhibited excellent antibacterial activity against both Gram-positive (*Staphylococcus aureus*) and Gram-negative (*Escherichia coli* and *Pseudomonas aeruginosa*) bacteria. Prepared SF and SF-VKC fibrous mats were well characterized, and the SF-VKC nanofiber mat presented good biodegradability, adhesiveness, unique mechanical property, expedient water uptake property, sustained drug release, and excellent biocompatibility for chronic wound healing. The in vitro tissue engineering study depicted excellent cell migration and cell-cell interaction in the NIH 3T3 cells over the VKC-impregnated silk fibroin (SF-VKC) mat. A higher population of cell migration was observed in cells' denuded area (scratched region) compared to the native SF fibrous mat. Interestingly, our results demonstrated that the prepared VKC-impregnated SF mat had potentially promoted the STZ-induced diabetic wound healing in a shorter period than the pure SF mat. Thus, obtained in vitro and in vivo outcomes suggest that the VKC-laden SF electrospun fibrous mat could be a better and inexpensive fibrous antibacterial biomaterial to elicit earlier re-epithelialization and efficient matrix remodeling for accelerating chronic infected wound reconstruction in skin diabetic wound healing applications. © 2021 American Chemical Society.

Number of references: 70

Main heading: Cell engineering

Controlled terms: Adhesives - Biocompatibility - Biodegradability - Biomechanics - Cell culture - Cells - Drug delivery - Drug products - Electrodeposition - Electrospinning - Electrospray ionization - *Escherichia coli* - Fourier transform infrared spectroscopy - Mass spectrometry - Peptides - Tissue - Tissue regeneration

Uncontrolled terms: Anti-bacterial activity - Attenuated total reflection fourier transform infrared - Electrospray ionization mass spectrometry - *Pseudomonas aeruginosa* - Regenerative functions - Structural confirmation - Sustained drug release - Water uptake properties

Classification code: 461 Bioengineering and Biology - 539.3.1 Electroplating - 801 Chemistry - 801.2 Biochemistry - 819.3 Fiber Chemistry and Processing

DOI: 10.1021/acsabm.0c01650

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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33. Waste eggshell membrane-assisted synthesis of magnetic CuFe₂O₄ nanomaterials with multifunctional properties (adsorptive, catalytic, antibacterial) for water remediation

Accession number: 20205209680256

Authors: Zhang, Yixia (1); Chen, Yaqin (1, 2); Kang, Ze-Wen (2); Gao, Xu (2); Zeng, Xian (2); Liu, Minghuan (2); Yang, Da-Peng (2)

Author affiliation: (1) Department of Biomedical Engineering, Research Center for Nano-biomaterials & Regenerative Medicine, College of Biomedical Engineering, Taiyuan University of Technology, Taiyuan; Shanxi Province; 030024, China; (2) Fujian Province Key Laboratory for Preparation and Function Development of Active Substances from Marine Algae, College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; Fujian Province; 362000, China

Corresponding author: Yang, Da-Peng(yangdp@qztc.edu.cn)

Source title: Colloids and Surfaces A: Physicochemical and Engineering Aspects

Abbreviated source title: Colloids Surf. A Physicochem. Eng. Asp.

Volume: 612

Issue date: March 5, 2021

Publication year: 2021

Article number: 125874

Language: English

ISSN: 09277757

E-ISSN: 18734359

CODEN: CPEAEH

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Dealing with water pollution is always a challenging task with the rapid development of society. The treatment of industrial wastewater usually requires the efficient and simple methods to reduce the harm to humans and the environment, and the complexity of the types of pollutants in the wastewater is a major challenge. Herein, eggshell membrane (ESM), a kind of agricultural waste with special hierarchical and porous structure, is considered as a promising bio-template for the successful fabrication of ESM-derived magnetic CuFe₂O₄ nanocomposite (defined as ESM/CuFe₂O₄). The nanocomposite exhibits unique morphological characters with 3D coral-like layered multi-channel architectures, which is completely different from that of pure CuFe₂O₄. Intriguingly, the magnetic ESM/CuFe₂O₄ can be used as a multi-functional material with enhanced adsorption, catalysis, and antibacterial performances for water remediation. The adsorption behavior of the ESM/CuFe₂O₄ to Congo red follows the pseudo-second-order kinetic model and the Freundlich adsorption isotherm with high correlation coefficients, and the maximum adsorption capability was determined to be 199.23 mg/g. The ESM/CuFe₂O₄ nanocomposite also displays the good catalytic activity and high recycling stability towards the reduction of 4-nitrophenol, and the degradation rate was reach up to 98.9 % only within 5.5 min, which is superior to some reported materials. Furthermore, it is demonstrated that the magnetic ESM/CuFe₂O₄ nanocomposite possesses strong antibacterial properties against Escherichia coli (E. coli) and Staphylococcus aureus (S. aureus). In addition, some effect factors, which play an important role in enhancing the performances, are also discussed. This study provides a cost-effective approach for fabrication of advanced "green" nanomaterials with excellent performances by adding agricultural waste-eggshell membrane for water remediation. © 2020 Elsevier B.V.

Number of references: 61

Main heading: Driers (materials)

Controlled terms: Adsorption - Agricultural robots - Agricultural wastes - Agriculture - Azo dyes - Catalyst activity - Copper compounds - Cost effectiveness - Degradation - Escherichia coli - Functional materials - Green manufacturing - Industrial water treatment - Iron compounds - Magnetism - Nanocomposites - Wastewater treatment - Water pollution

Uncontrolled terms: Anti-bacterial performance - Antibacterial properties - Escherichia coli (E. coli) - Freundlich adsorption isotherms - Morphological characters - Multi-functional materials - Multifunctional properties - Pseudo-second-order kinetic models

Classification code: 445.1.2 Water Treatment Techniques for Industrial Use - 452.4 Industrial Wastes Treatment and Disposal - 453 Water Pollution - 701.2 Magnetism: Basic Concepts and Phenomena - 761 Nanotechnology - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 821.5 Agricultural Wastes - 911.2 Industrial Economics - 933 Solid State Physics - 951 Materials Science

Numerical data indexing: Percentage 9.89e+01%, Time 3.30e+02s

DOI: 10.1016/j.colsurfa.2020.125874

Funding Details: Number: 201901D211084, Acronym: -, Sponsor: Natural Science Foundation of Shanxi Province; Number: 2019H0023, Acronym: -, Sponsor: Fujian Provincial Department of Science and Technology;

Funding text: This work was supported by the NSFC Natural Science Foundation of China (No. 81602506), the Natural Science Foundation of Shanxi Province (201901D211084). Orientative project funded by Fujian Provincial Science and Technology Department (2019H0023), Quanzhou City Science & Technology Program of China (2017G023).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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34. The Anti-oxidative Capacity of Milk Tablet Enriched with SOD (MKTES) and Its Effect on Human Electrical Potential

Accession number: 20213010677914

Title of translation: SOD

Authors: Yan, Suqing (1); Yu, Xiaowei (1); Guo, Jingke (2); Xu, Mingming (3); Chen, Luhang (4); Wang, Qiang (5); Ke, Lijing (1); Rao, Pingfan (1)

Author affiliation: (1) SIBS., CAS-Zhejiang Gongshang University Joint Centre for Food and Nutrition Research, Hangzhou; 310035, China; (2) Zhicheng College, Fuzhou University, Fuzhou; 350002, China; (3) College of Oceanology and Food Science, Quanzhou Normal University, Quanzhou; 362000, China; (4) Zhejiang Chinese Medical University, Hangzhou; 310000, China; (5) Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, Beijing; 100193, China

Corresponding authors: Guo, Jingke(kengco@qq.com); Rao, Pingfan(pingfan.rao@gmail.com)

Source title: Journal of Chinese Institute of Food Science and Technology

Abbreviated source title: J. Chin. Inst. Food Sci. Technol.

Volume: 21

Issue: 6

Issue date: June 30, 2021

Publication year: 2021

Pages: 107-113

Language: Chinese

ISSN: 10097848

Document type: Journal article (JA)

Publisher: Chinese Institute of Food Science and Technology

Abstract: Superoxide dismutase (SOD) is a kind of main antioxidant enzyme produced in organism, which can eliminate superoxide anion produced by respiratory metabolism. Milk contains SOD, and SOD is added to dairy products as a food additive to improve the oxidation resistance of products. In order to study the antioxidant activity of milk tablet enriched with SOD(MKTES) and its function from the perspective of its effect on the electrical potential difference (EPD) of 12 acupuncture meridians, the oxidation-reduction potential (ORP), DPPH free radical scavenging capacity and SOD activity were studied respectively for the milk tablet (1.00 g milk powder) and MKTES (0.99 g milk powder + 0.01 g 2.53×10^6 U/g SOD). 20 healthy volunteers were recruited and randomly divided into two groups for a double-blind clinical trial. The subjects in milk tablet group took sublingually 1 milk tablet, while the MKTES group took 1 tablet of MKTES. The EPD of 12 meridians on the left side were recorded in real time. Samples were taken at the 25th min. The whole procedure continued 85 mins. The results showed that SOD activity and reducibility (ORP value decreased) of MKTES were significantly increased compared with the milk tablet. DPPH radical scavenging rate increased at the concentration of 1.250 and 1.562 mg/mL but decreased at 3.125 mg/mL. The results of EPD monitoring showed that the milk tablet had no effect on the EPD of Lung Meridian and Gallbladder Meridian, while MKTES had. Compared with the milk tablet, MKTES has a stronger effect on the EPD of Large Intestine Meridian, Spleen Meridian, Small Intestine Meridian, Bladder Meridian, Triple Energizer Meridian and Liver Meridian. Both milk tablet and MKTES have certain effects on the EPD of Stomach Meridian, Heart Meridian, Kidney Meridian and Pericardium Meridian. © 2021, Editorial Office of Journal of CIFST. All right reserved.

Number of references: 24

Main heading: Dairies

Controlled terms: Antioxidants - Biological organs - Enzymes - Free radicals - Oxidation resistance - Plants (botany) - Redox reactions

Uncontrolled terms: Anti-oxidant activities - Antioxidant enzyme - Dpph free radical scavenging capacities - Electrical potential - Healthy volunteers - Oxidation reduction potential - Oxidative capacity - Superoxide dismutases

Classification code: 461.2 Biological Materials and Tissue Engineering - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 822.1 Food Products Plants and Equipment

Numerical data indexing: Mass 1.00×10^{-3} kg, Mass 9.90×10^{-4} kg, Mass_Density 1.25×10^0 kg/m³, Mass_Density 1.56×10^0 kg/m³, Mass_Density 3.12×10^0 kg/m³, Time 5.10×10^3 s

DOI: 10.16429/j.1009-7848.2021.06.013

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

35. NDMA formation during ozonation of metformin: Roles of ozone and hydroxyl radicals

Accession number: 20212910654203

Authors: Liao, Xiaobin (1); Shen, Linlu (1, 3); Jiang, Zhibin (1); Gao, Menglan (1); Qiu, Yu (4); Qi, Huan (2); Chen, Chao (4)

Author affiliation: (1) Institute of Municipal and Environmental Engineering, College of Civil Engineering, Huaqiao University, Fujian; 361021, China; (2) College of Textiles and Apparel, Quanzhou Normal University, Fujian; 362002, China; (3) State Key Laboratory of Urban Water Resource and Environment, School of Environment, Harbin Institute of Technology, Harbin; 150000, China; (4) State Key Joint Laboratory of Environment Simulation and Pollution Control, School of Environment, Tsinghua University, Beijing; 100084, China

Corresponding authors: Liao, Xiaobin(liaoxb@hqu.edu.cn); Chen, Chao(chen_water@tsinghua.edu.cn)

Source title: Science of the Total Environment

Abbreviated source title: Sci. Total Environ.

Volume: 796

Issue date: November 20, 2021

Publication year: 2021

Article number: 149010

Language: English

ISSN: 00489697

E-ISSN: 18791026

CODEN: STEVA8

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Metformin, a high-consumed pharmaceutical for diabetes, has been reported to generate carcinogenic nitroso-dimethylamine (NDMA) during treatment of its containing wastewater. However, whether it would produce NDMA during ozonation or not is unclear, let alone discriminate roles of ozone (O₃) and hydroxyl radicals ([rad]OH). In this paper, effects of ozonation on NDMA formation from metformin were investigated, roles of O₃ and [rad]OH were also distinguished by adding tert-butyl alcohol (tBA) as [rad]OH scavenger. Moreover, various influencing factors and reaction mechanisms were demonstrated. The results indicated that NDMA could be directly formed from metformin during ozonation, the addition of [rad]OH scavenger significantly enhanced its formation (0–46.2 ng/L vs 0–139.1 ng/L). The formation of NDMA by O₃ and [rad]OH was more affected by bromide and HCO₃⁻ than those with only O₃; while the impacts of pH and sulphate on the latter were more notable. No matter without/with tBA in the solution, the formed NDMA during ozonation of metformin increased with raising pH (from 5 to 9) and achieved the maximum 69.6 ng/L and 235.9 ng/L at pH 9, respectively; small amount of bromide (0.1 μM) promoted NDMA production, high levels of bromide (10 μM) inhibited its formation; the existence of HCO₃⁻ enhanced the amounts of NDMA from 44.5 to 73.5 ng/L (raised by 65.2%) by O₃ and [rad]OH and from 102.9 to 130 ng/L with only O₃ (raised by 26.3%); with the addition of sulphate, NDMA concentration raised by 43.8% by O₃ and [rad]OH, while the value was high up to 134.6% with only O₃. Based on the result of UPLC-Q-TOF and density functional theory, the oxidation intermediates were identified and possible transformation pathways of metformin during ozonation were proposed. The findings in this paper would provide reference when treating metformin-containing water in future. © 2021 Elsevier B.V.

Number of references: 58

Main heading: Ozonation

Controlled terms: Alcohols - Density functional theory - Drug products - Ozone - Ozone water treatment - Reaction intermediates - Sulfur compounds - Wastewater treatment

Uncontrolled terms: Carcinogenics - Dimethylamines - Hydroxyl radical scavenger - Hydroxyl radicals - Metformins - Nitroso - Nitroso-dimethylamine - OH⁺ - Sulphates - Tert-butyl alcohols

Classification code: 445.1 Water Treatment Techniques - 452.4 Industrial Wastes Treatment and Disposal - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.1 Organic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics

Numerical data indexing: Mass 1.029E-10kg to 1.30E-10kg, Mass 1.391E-10kg, Mass 2.359E-10kg, Mass 4.45E-11kg to 7.35E-11kg, Mass 4.62E-11kg, Mass 6.96E-11kg, Percentage 1.346E+02%, Percentage 2.63E+01%, Percentage 4.38E+01%, Percentage 6.52E+01%, Size 1.00E-05m, Size 1.00E-07m

DOI: 10.1016/j.scitotenv.2021.149010

Funding Details: Number: 201908350069, Acronym: CSC, Sponsor: China Scholarship Council; Number: 51878301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: The authors would like to thank Susan Richardson from University of South Carolina for English language suggestions. This work was financially supported by National Natural Science Foundation of China (No. 51878301), Key projects of Quanzhou science and technology plan (No. 2018Z004). In addition, we acknowledge the support of China Scholarship Council (CSC, 201908350069) and the subsidized Project for Postgraduates' Innovative Fund in Scientific Research of Huaqiao University.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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36. Enhancing the Health and Well-Being of People with Chronic Diseases: Assessment and Sustainable Development Planning for Therapeutic Landscapes after Urban Expansion (Open Access)

Accession number: 20214311054742

Authors: Mei, Lin (1); Liu, Kun (2); Zhu, Bo-Wei (3)

Author affiliation: (1) School of Art and Design, Wuhan University of Technology, Hubei, Wuhan; 430070, China; (2) School of Art and Design, Quanzhou Normal University, Feng ze, Fujian, Quanzhou; 362000, China; (3) Faculty of Humanities and Arts, Macau University of Science and Technology, 999078, China

Corresponding author: Zhu, Bo-Wei(bwzhu@must.edu.mo)

Source title: Journal of Healthcare Engineering

Abbreviated source title: J. Healthc. Eng.

Volume: 2021

Issue date: 2021

Publication year: 2021

Article number: 2828141

Language: English

ISSN: 20402295

E-ISSN: 20402309

Document type: Journal article (JA)

Publisher: Hindawi Limited

Abstract: Under the influence of economic, environmental, and social structural changes, urban space expands and contracts to varying degrees and the everyday urban landscape changes in response. Over the past 20 years, a large number of cities in China have undergone a brief but rapid urban expansion and are moving toward shrinking cities. Most of these cities are now facing social problems such as an aging population and a high prevalence of chronic diseases. Therefore, the "therapeutic" role and impact of everyday landscapes in these cities need to be examined in the context of urban development processes through appropriate assessment methods. Therefore, this study applies the ANP-mV model to examine the therapeutic nature of everyday urban landscapes in different development periods, with the aim of enhancing the health and well-being of people with chronic diseases. Firstly, this study uses the city of Jinzhou in Northeast China as an example to develop a framework for assessing the therapeutic nature of everyday urban landscapes based on the health care needs of people with chronic diseases; secondly, it examines the therapeutic nature of the former Jinzhou Suburban Riverfront Forest Park as it has developed and evolved over the past 16 years; finally, it explores place-making and regeneration strategies for therapeutic landscapes from the perspectives of dynamic impact and sustainable development to enhance chronic illness patients' well-being. At the theoretical level, this study contributes by providing a methodology and research ideas for examining the "therapeutic" nature of everyday urban landscapes and proposing further development plans for renewal, constructing a framework for assessing therapeutic landscapes, and elucidating the relationship between networks of influence and the relative importance of various assessment dimensions/elements. At the practical application level, the contribution of this study is to provide local policymakers with a key decision basis for the future development planning of the East Lake Forest Park. The aim is to explore landscape creation and regeneration strategies for the East Lake Forest Park in the context of Jinzhou's progressive move toward a shrinking city, in order to sustain the well-being of the chronically ill. © 2021 Lin Mei et al.

Number of references: 50

Main heading: Diseases

Controlled terms: Lakes - Parks - Planning - Reforestation - Sustainable development - Urban growth

Uncontrolled terms: Chronic disease - Development planning - Landscape changes - Regeneration strategies - Shrinking city - Therapeutic landscapes - Urban expansion - Urban landscape - Urban spaces - Well being

Classification code: 403.1 Urban Planning and Development - 821.0 Woodlands and Forestry - 912.2 Management

Numerical data indexing: Age 1.60E+01yr, Age 2.00E+01yr

DOI: 10.1155/2021/2828141

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

37. Multi-peak narrow-band perfect absorber based on two-dimensional graphene array

Accession number: 20214311083724

Authors: Li, Rui (1); Zheng, Ying (1); Luo, Yao (1); Zhang, Jianguo (2); Yi, Zao (1); Liu, Li (1); Song, Qianjv (1); Wu, Pinghui (3); Yu, Yang (4); Zhang, Jianfa (5, 6)

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Corresponding authors: Yi, Zao(yizaomy@swust.edu.cn); Zhang, Jianfa(jfzhang85@nudt.edu.cn)

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Abbreviated source title: Diamond Relat. Mat.

Volume: 120

Issue date: December 2021

Publication year: 2021

Article number: 108666

Language: English

ISSN: 09259635

CODEN: DRMTE3

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: In this paper, we have investigated an absorber based on two-dimensional hexagonal graphene array and theoretically propose a calculation method for the approximate conductivity of graphene in the terahertz band and its correction term, and we also theoretically explain the phenomenon of blue-shift of the absorption spectrum with increasing graphene chemical potential. The finite difference time domain (FDTD) method shows that this absorber has the advantages of exciting high absorption rate, multi-band, tunable and high figure of merit (FOM). By discussing the analysis of different graphene geometries, we demonstrate the optimality of this result. The bottom layer of our absorber is composed of an Au reflection layer, and the middle layer is a silicon oxide dielectric layer. Four hexagonal two-dimensional graphene is placed at the top. Taking this as the basic unit, an array can be formed. Our absorber has a simple structure, which simplified the processing technology and saves the processing cost greatly. In the near-infrared band from 1600 nm to 1900 nm, our absorbers have absorption peaks of 99.70%, 99.25% and 99.82% at 1667.19 nm, 1691.71 nm and 1773.20 nm, respectively. In addition, the resonance wavelength of the absorber can also be adjusted by adjusting the chemical potential and refractive index of the silicon dioxide layer. The absorber also has the features of polarization and angular insensitivity. Our simulation results show that our absorber's absorption spectrum will change significantly as the ambient refractive index changes, and based on this, we can calculate the sensitivity and the figure of merit (FOM) of our model. We finally calculated the best FOM for the three peaks of our absorber (sorted by resonance wavelength from short to long) is 90.93, 90.96, 107.34, and the sensitivity is 290.25 nm/RIU, 309.95 nm/RIU, 318.50 nm/RIU, respectively. Thus, we trust that our absorbers can be widely used in Near-infrared thermal radiation, optical detector and Near-infrared sensors. © 2021

Number of references: 74

Main heading: Graphene

Controlled terms: Absorption spectroscopy - Blue shift - Chemical potential - Electromagnetic wave absorption - Finite difference time domain method - Infrared devices - Red Shift - Refractive index - Silica - Temperature

Uncontrolled terms: High figure of merit - Multi band - Multi-band perfect absorber - Multi-peaks - Narrow bands - Perfect absorber - Resonance wavelengths - Terahertz band - Tunables - Two-dimensional

Classification code: 641.1 Thermodynamics - 711 Electromagnetic Waves - 741.1 Light/Optics - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 921 Mathematics

Numerical data indexing: Percentage 9.925E+01%, Percentage 9.97E+01%, Percentage 9.982E+01%, Size 1.60E-06m to 1.90E-06m, Size 1.66719E-06m, Size 1.69171E-06m, Size 1.7732E-06m, Size 2.9025E-07m, Size 3.0995E-07m, Size 3.185E-07m

DOI: 10.1016/j.diamond.2021.108666

Funding Details: Number: 11604311, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 12074151, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020YFG0467, Acronym: SPDST, Sponsor: Department of Science and Technology of Sichuan Province; Number: 2020YJ0137, Acronym: SPDST, Sponsor: Department of Science and Technology of Sichuan Province; Number: 2021JDRC0019, Acronym: SPDST, Sponsor: Department of Science and Technology of Sichuan Province; Number: 51606158, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: CX 21-099, Acronym: SWUST, Sponsor: Southwest University of Science and Technology; Number: CX21-008, Acronym: SWUST, Sponsor: Southwest University of Science and Technology; Number: LX2020010, Acronym: SWUST, Sponsor: Southwest University of Science and Technology;

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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38. Self-Assembled Nanocomposite Film of AgN In-Situ Grown on Polydopamine With Enhanced Fluorescence of CDs for Detection of Puerarin

Accession number: 20210409818964

Title of translation:

Authors: Weng, Wen-Ting (1); Wang, Si-Yu (1); Zhuang, Jun-Yang (1)

Author affiliation: (1) College of Chemical Engineering and Material, Quanzhou Normal University, Quanzhou; 362000, China

Source title: Guang Pu Xue Yu Guang Pu Fen Xi/Spectroscopy and Spectral Analysis

Abbreviated source title: Guang Pu Xue Yu Guang Pu Fen Xi

Volume: 41

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Issue date: January 2021

Publication year: 2021

Pages: 168-176

Language: Chinese

ISSN: 10000593

CODEN: GYGFED

Document type: Journal article (JA)

Publisher: Science Press

Abstract: The S, N co-doped carbon dots was obtained through the one-step hydrothermal treatment of cystine and citric acid. The results suggested that the prepared carbon dot solution has fluorescence emission at 455 nm with an excitation wavelength of 350 nm. This fluorescent Carbon Dots (FCDs) showed stable emission performance in pH 6~11 and bright blue emission with a quantum yield of 61.7% and an average lifetime of 10.75 ns. In this article, a sample preparation scheme with self-assembled nanocomposite film of silver nanoparticle (AgN) was designed to enhance the optically stimulated luminescence emission of FCDs. The enhanced PL signal of FCDs grown on sensing film leading to a higher sensitivity of drug content detection. A uniform nanocomposite film substrate was prepared via the reduction in situ of silver ions in polydopamine (PDA). The Enhanced Fluorescence film FTO/PDA-AgN/PDDA/[PSS/PDDA]3/FCDs was achieved by self-assembled the polyelectrolyte molecular Layer-by-Layer (LbL) on the nanocomposite film that was utilized to control the distance of silver nanoparticle (AgN) and fluorescent Carbon Dots (FCDs). The synchronous reduction method was easy to operate, and the results of Ultraviolet, Fluorescence, Raman spectra and scanning electron microscopy revealed that the composite silver nanostructure in polydopamine film result in the AgN has the advantage of not being oxidized. The silver nanoparticles could enhance the optically stimulated luminescence emission of FCDs as the separation distance was optimally designed between FCDs and AgN surface, the fluorescent intensity of FCDs in SAMs increased by nearly 3 times with the corresponding fluorescence lifetime reduced from 6.08 to 2.98 ns. The characteristics of the AgN-enhanced fluorescence which has distance-dependence, accelerated radiation attenuation and correlation with the reduction degree of AgN were additional evidence for a local surface plasmon resonance effect between AgN and FCDs. The experimental results showed that the addition of puerarin (Pue) quenched the fluorescence signal of FCDs, and the degree of quenching had a good linear relationship with the content of puerarin in the range of $3.33 \times 10^{-7} \sim 1.50 \times 10^{-5} \text{ mol} \cdot \text{L}^{-1}$. The linear regression equation is $I_0/I = 2.843 \times 10^4 c_{\text{Pue}} + 1.068$, the correlation coefficient $R = 0.99856$, and the detection limit $QL = 2.31 \times 10^{-7} \text{ mol} \cdot \text{L}^{-1}$. This established AgN-enhanced fluorescence system based on the SAMs could increase the sensitivity of the detection for puerarin as the detection limit was reduced about an order of magnitude. © 2021, Peking University Press. All right reserved.

Number of references: 14

Main heading: Nanocomposite films

Controlled terms: Carbon - Drug delivery - Film preparation - Fluorescence - Indium compounds - Metal ions - Metal nanoparticles - Nanocomposites - Organic compounds - Plasmons - Polyelectrolytes - Scanning electron microscopy - Silver compounds - Silver metallography - Silver nanoparticles - Surface plasmon resonance

Uncontrolled terms: Correlation coefficient - Fluorescence lifetimes - Fluorescent intensity - Hydrothermal treatments - Linear regression equation - Local surface plasmon resonances - Optically stimulated luminescence - Radiation attenuation

Classification code: 531.1 Metallurgy - 531.2 Metallography - 712.1 Semiconducting Materials - 741.1 Light/Optics - 761 Nanotechnology - 804 Chemical Products Generally - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 931.3 Atomic and Molecular Physics

Numerical data indexing: Percentage 6.17×10^{-1} %, Size $3.50 \times 10^{-7} \text{ m}$, Size $4.55 \times 10^{-7} \text{ m}$, Time $1.08 \times 10^{-8} \text{ s}$, Time $6.08 \times 10^{-9} \text{ s}$ to $2.98 \times 10^{-9} \text{ s}$

DOI: 10.3964/j.issn.1000-0593(2021)01-0168-09

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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39. MOFs-derived porous carbon materials for gas adsorption and separation

Accession number: 20214110992659

Title of translation: MOFs

Authors: Sun, Xuejiao (1, 2); Wang, Chenpeng (1, 2); Pan, Xiaoyang (2); Liu, Yubin (2); Chen, Kongfa (1); Luo, Shuiyuan (2)

Author affiliation: (1) College of Materials Science and Engineering, Fuzhou University, Fuzhou; 350108, China; (2) School of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Chen, Kongfa(kongfa.chen@fzu.edu.cn); Luo, Shuiyuan(syluo@qztc.edu.cn)

Source title: Kexue Tongbao/Chinese Science Bulletin

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Document type: Journal article (JA)

Publisher: Chinese Academy of Sciences

Abstract: The adsorption and separation of gases are important for mitigating the greenhouse effect, popularizing clean energy and treating volatile organic compounds (VOCs). Metal organic frameworks (MOFs) have been attracted broad attention due to their high specific surface area, adjustable pore structure and surface functionality. MOFs have been widely applied in gas adsorption and separation. The drawbacks of some MOFs are the high humidity sensitivity and poor thermal stability that hinder their industrial applications. Porous carbon materials possess high specific surface area, exceptional chemical and thermal stabilities. Porous carbon materials derived from MOFs as precursors not only overcome the shortcomings of some MOFs with poor water and thermal stabilities, but also retain the advantages of MOFs materials effectively. MOFs-derived porous carbon materials have good application prospects in gas adsorption and separation. This paper introduces the research status of MOFs-derived porous carbon materials, and focuses on their applications in the field of gas adsorption and separation. Synthesis methods for MOFs-derived porous carbon materials mainly include direct carbonization, carbonization with additional precursor and chemical activation. Specific surface area, pore size and surface functional groups of MOFs-derived porous carbon materials have great impact on their adsorption and separation performances for gases (carbon dioxide, hydrogen and volatile organic compounds). In general, MOFs-derived porous carbon materials with high surface area could exhibit excellent adsorption performance for CO₂. And the pore size characteristics of MOFs-derived porous carbon materials play important roles in the adsorption capacity and diffusion rate of CO₂. Nitrogen doping can improve CO₂ adsorption capacities owing to Lewis acid-base interaction, electrostatic interaction and hydrogen bonding between the surface functional groups of MOFs-derived porous carbon materials and CO₂. Furthermore, H₂ storage is primarily determined by the narrow micropore, and chemical doping can effectively promote H₂ storage of MOFs-derived porous carbon materials. In addition, VOCs adsorption is associated with the physiochemical characters of adsorbents (e.g., specific surface area, pore size, pore volume, surface chemical functional groups), properties of adsorbates (e.g., molecular weight, molecular structure, polarity, and boiling point) as well as the adsorption conditions (e.g., temperature and humidity). However, the researches on MOFs-derived porous carbon materials in gas adsorption and separation still face many challenges. (1) The pore structure, morphology and surface chemical properties of MOFs-derived porous carbon materials are directly affected by various factors, such as types of MOFs, types and amounts of additional carbon sources or additional nitrogen sources, carbonization temperature, time and atmosphere, types and ratios of activators, activation temperature and time, chemical doping and so on. (2) There are rare studies on the adsorption mechanism of MOF-derived porous carbon materials for various gases, the multi-component competitive adsorption mechanism, and the influence of environmental factors (such as environmental temperature and humidity) on the adsorption performance. (3) Environmental pollution will be caused during the chemical activation process of MOFs-derived porous carbon materials. At present, there are few reports on the recovery of pyrolysis gases and dispose of the generated waste during the activation process. (4) There is an urgent need to develop new synthetic methods for MOFs-derived porous carbon materials to achieve large-scale production. In a word, the related researches of MOFs-derived porous carbon materials can not only expand the application range of MOFs materials, but also promote the development of gas adsorption and separation. We believe that the application of MOFs-derived porous carbon materials in the field of gas adsorption and separation will make great breakthrough in the future. © 2021, Science Press. All right reserved.

Number of references: 79

Main heading: Gas chromatography

Controlled terms: Carbon dioxide - Carbonization - Chemical activation - Gas adsorption - Hydrogen bonds - Organic carbon - Organometallics - Petroleum prospecting - Pore size - Pore structure - Separation - Specific surface area - Thermodynamic stability - Volatile organic compounds

Uncontrolled terms: Adsorption capacities - Adsorption performance - Gas adsorption and separations - High specific surface area - Metal organic framework materials - Metalorganic frameworks (MOFs) - Pore surface - Pores structure - Porous carbon materials - Surface functional groups

Classification code: 512.1.2 Petroleum Deposits : Development Operations - 641.1 Thermodynamics - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science

DOI: 10.1360/TB-2020-1670

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

40. Photomultiplication type near-infrared organic photodetectors with a mixed active layer

Accession number: 20203809208624

Authors: Wu, Lishuang (1, 2); Xu, Rudan (1); Yao, Guangping (1, 2); Su, Dasheng (1, 2); Su, Zisheng (1, 2, 3); Yang, Huishan (1, 2, 3)

Author affiliation: (1) College of Physics and Information Engineering, Quanzhou Normal University, Quanzhou, China; (2) Key Laboratory of Information Functional Material for Fujian Higher Education, Quanzhou Normal University, Quanzhou, China; (3) Fujian Provincial Key Laboratory for Advanced Micro-Nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou, China

Corresponding authors: Su, Zisheng(suzs@ciomp.ac.cn); Yang, Huishan(yanghuishan1697@163.com); Su, Zisheng(suzs@ciomp.ac.cn); Yang, Huishan(yanghuishan1697@163.com); Su, Zisheng(suzs@ciomp.ac.cn); Yang, Huishan(yanghuishan1697@163.com)

Source title: Microwave and Optical Technology Letters

Abbreviated source title: Microwave Opt Technol Lett

Volume: 63

Issue: 2

Issue date: February 2021

Publication year: 2021

Pages: 714-718

Language: English

ISSN: 08952477

E-ISSN: 10982760

CODEN: MOTLEO

Document type: Journal article (JA)

Publisher: John Wiley and Sons Inc

Abstract: Photomultiplication type near-infrared (NIR) organic photodetectors (OPDs) are constructed with lead phthalocyanine (PbPc) and C60 acted as the donor and acceptor, respectively. Compared with the PbPc/C60 planar heterojunction device, the PbPc:C60 mixed active layer devices show enhanced NIR responses. The optimized mixed active layer device displays an external quantum efficiency (EQE) of 22.8% at 870 nm under zero bias, which is about 45% higher than that of planar heterojunction device. Moreover, it also presents a detectivity in the order of 10^{12} Jones and an EQE of 400% under applied bias of -8 V, indicating a photocurrent gain obtained in the device. Although the mixed active layer devices have a lower absorption in the NIR region, the donor: acceptor mixed structure increases the donor/acceptor contact area and forms continuous carrier transport paths, which increases the excitons dissociation efficiency and the photogenerated carriers collection efficiency and hence the response of the devices. © 2020 Wiley Periodicals LLC

Number of references: 23

Main heading: Infrared devices

Controlled terms: Display devices - Efficiency - Heterojunctions - Photodetectors - Photons

Uncontrolled terms: Collection efficiency - Dissociation efficiency - External quantum efficiency - Heterojunction devices - Lead phthalocyanine - Organic photodetector - Photogenerated carriers - Photomultiplication

Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 722.2 Computer Peripheral Equipment - 913.1 Production Engineering - 931.3 Atomic and Molecular Physics

Numerical data indexing: Percentage 2.28e+01%, Percentage 4.00e+02%, Percentage 4.50e+01%, Size 8.70e-07m

DOI: 10.1002/mop.32647

Funding Details: Number: 61575192, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: NCET, Sponsor: Program for New Century Excellent Talents in University;
Funding text: This work was supported by the National Natural Science Foundation of China (61575192) and the Program for New Century Excellent Talents in Fujian Province University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
 Compilation and indexing terms, Copyright 2021 Elsevier Inc.

41. Comparative analysis of pulmonary nodules segmentation using multiscale residual U-Net and fuzzy C-means clustering

Accession number: 20213210733962

Authors: Shi, Jianshe (1, 2, 3); Ye, Yuguang (1, 3, 4); Zhu, Daxin (1, 3, 4); Su, Lianta (1, 3, 4); Huang, Yifeng (5); Huang, Jianlong (1, 3, 4)

Author affiliation: (1) Fujian Provincial Key Laboratory of Data Intensive Computing, Quanzhou Normal University, Quanzhou; 362000, China; (2) Department of General Surgery, Huaqiao University Affiliated Strait Hospital, Quanzhou; Fujian; 362000, China; (3) Key Laboratory of Intelligent Computing and Information Processing, Quanzhou Normal University, Fujian Province University, Quanzhou; 362000, China; (4) Faculty of Mathematics and Computer Science, Quanzhou Normal University, Quanzhou; 362000, China; (5) Department of Diagnostic Radiology, Huaqiao University Affiliated Strait Hospital, Quanzhou; Fujian; 362000, China

Corresponding authors: Huang, Yifeng(di180ywc@163.com); Huang, Jianlong(robotics@qztc.edu.cn)

Source title: Computer Methods and Programs in Biomedicine

Abbreviated source title: Comput. Methods Programs Biomed.

Volume: 209

Issue date: September 2021

Publication year: 2021

Article number: 106332

Language: English

ISSN: 01692607

E-ISSN: 18727565

CODEN: CMPBEK

Document type: Journal article (JA)

Publisher: Elsevier Ireland Ltd

Abstract: Background and Objective: Pulmonary nodules have different shapes and uneven density, and some nodules adhere to blood vessels, pleura and other anatomical structures, which increase the difficulty of nodule segmentation. The purpose of this paper is to use multiscale residual U-Net to accurately segment lung nodules with complex geometric shapes, while comparing it with fuzzy C-means clustering and manual segmentation. Method: We selected 58 computed tomography (CT) scan images of patients with different lung nodules for image segmentation. This paper proposes an automatic segmentation algorithm for lung nodules based on multiscale residual U-Net. In order to verify the accuracy of the method, we also conducted comparative experiments, while comparing it with fuzzy C-means clustering. Results: Compared with the other two methods, the segmentation of lung nodules based on multiscale residual U-Net has a higher accuracy, with an accuracy rate of 94.57%. This method not only maintains a high accuracy rate, but also shortens the recognition time significantly with a segmentation time of 3.15 s. Conclusions: The diagnosis method of lung nodules combined with deep learning has a good market prospect and can improve the efficiency of doctors in diagnosing benign and malignant lung nodules. © 2021

Number of references: 22

Main heading: Biological organs

Controlled terms: Blood vessels - Computerized tomography - Deep learning - Diagnosis - Fuzzy inference - Fuzzy neural networks - Fuzzy systems - Image segmentation - Positron emission tomography

Uncontrolled terms: Accuracy rate - Comparative analysis - Convolutional neural network - Different shapes - Fcm clustering (Fuzzy CMeans) - High-accuracy - Lung nodule - Multiscale residual U-net - Nodule segmentation - Pulmonary nodules

Classification code: 461.2 Biological Materials and Tissue Engineering - 461.4 Ergonomics and Human Factors Engineering - 461.6 Medicine and Pharmacology - 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 723.4 Artificial Intelligence - 723.4.1 Expert Systems - 723.5 Computer Applications - 961 Systems Science

Numerical data indexing: Percentage 9.457E+01%, Time 3.15E+00s

DOI: 10.1016/j.cmpb.2021.106332

Funding text: This research is supported by Science and Technology Program of Quanzhou (No. 2021CT0010). The authors also acknowledge the support by Fujian Provincial Key Laboratory of Data-Intensive Computing, Fujian University Laboratory of Intelligent Computing and Information Processing, and Fujian Provincial Big Data Research Institute of Intelligent Manufacturing. Special thanks are extended to The Huaqiao University Affiliated Strait Hospital for providing the medical and health big data used in this paper.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

42. Eco-friendly antibacterial dyeing of poly(lactic acid) with prodigiosins suspension produced by *Zooshikella ganghwensis*

Accession number: 20214211042198

Authors: Feng, Lili (1, 2); Ren, Limin (1); Wang, Lejun (3); Zhang, Hongjie (1, 2)

Author affiliation: (1) Quanzhou Normal University, Quanzhou, China; (2) Ecological Intelligent Weaving Engineering Research Institute of Quanzhou Normal University(Shishi), Quanzhou, China; (3) Hengtian Fiber Group Co., Ltd, Beijing, China

Corresponding author: Zhang, Hongjie

Source title: Journal of the Textile Institute

Abbreviated source title: J. Text. Inst.

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 00405000

E-ISSN: 17542340

CODEN: JTINA7

Document type: Article in Press

Publisher: Taylor and Francis Ltd.

Abstract: Dyeing poly(lactic acid) (PLA) fiber with natural dyestuffs has attracted a lot of attentions due to the production of the fully eco-friendly textile products. In this study, PLA nonwoven fabric was successfully dyed using microbial prodigiosins as clean disperse dyestuff. Prodigiosins suspension with the mean size 243.6 nm was prepared by the fermentation of *Zooshikella ganghwensis* in the presence of nonionic surfactant. Meanwhile, the dyeing process to endow PLA nonwoven fabric with purplish red color as well as antibacterial performance was investigated in detail. The results indicated that the PLA nonwoven fabric exhibited good color strength, low strength loss, good bacteriostatic properties against *Staphylococcus aureus* when it was dyed under dyebath pH of 4–5 at 90 °C for 20 min. Additionally, the dyed PLA nonwoven fabrics showed excellent rubbing fastness and washing fastness. Overall, a clean dyeing process using microbial prodigiosins from renewable sources as functional disperse dyestuff for PLA nonwoven fabric is developed, which is beneficial to realize the further green production of PLA nonwoven fabric. © 2021 The Textile Institute.

Number of references: 35

Main heading: Dyeing

Controlled terms: Bacteria - Environmental protection - Lactic acid - Nonionic surfactants - Nonwoven fabrics - Suspensions (fluids)

Uncontrolled terms: Antibacterial dyeing - Antibacterials - Disperse dyestuffs - Dyeing process - Eco-friendly - Poly lactic acid - Poly(lactic acid) - Prodigiosin - Prodigiosin suspension - *Zooshikella ganghwensis*

Classification code: 454.2 Environmental Impact and Protection - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 819.5 Textile Products and Processing

Numerical data indexing: Size 2.436E-07m, Temperature 3.63E+02K, Time 1.20E+03s

DOI: 10.1080/00405000.2021.1990545

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

43. *Cyclocarya paliurus* for Phytomanagement of Lead-Contaminated Soils

Accession number: 20211310148077

Authors: Feng, Ying (1, 2); Xu, Jinghua (1, 2); Wu, Ziwei (1); Qian, Lianwen (1, 2); Jiang, Jinping (3); Chen, Yongshan (1, 2)

Author affiliation: (1) School of Resources and Environmental Science, Quanzhou Normal University, Quanzhou; 362000, China; (2) Institution of Environmental Science, Quanzhou Normal University, Quanzhou; 362000, China; (3) Guangxi Scientific Experiment Center of Mining, Metallurgy and Environment, Guilin University of Technology, Guilin; 541004, China

Corresponding author: Chen, Yongshan(yshchen421@163.com)

Source title: Bulletin of Environmental Contamination and Toxicology

Abbreviated source title: Bull. Environ. Contam. Toxicol.

Volume: 106

Issue: 6

Issue date: June 2021

Publication year: 2021

Pages: 1003-1008

Language: English

ISSN: 00074861

E-ISSN: 14320800

CODEN: BECTA6

Document type: Journal article (JA)

Publisher: Springer

Abstract: Cyclocarya paliurus seedlings were cultivated in three types of lead (Pb)-contaminated soils with Pb concentration of 305 ± 17 mg/kg (T1), 1964 ± 59 mg/kg (T2) and 3502 ± 107 mg/kg (T3), respectively. The results showed that after 180 days of cultivation, the contents of exchangeable and carbonate-bound Pb fractions significantly decreased in T1 and T2, but increased in T3. The growth indices of C. paliurus seedlings decreased with increasing Pb concentration; however, no difference was found between that in T1 and in Pb-free soil. The Pb concentration in the roots was an order of magnitude higher than that in the stems and in the leaves. The bioconcentration factor (BCF) of the leaves was the lowest among the three tissues investigated, and decreased with the higher concentration of Pb in the soils. These results suggest that C. paliurus can be used as a sustainable and profitable plant for the phytomanagement of Pb-contaminated soil. © 2021, The Author(s), under exclusive licence to Springer Science +Business Media, LLC, part of Springer Nature.

Number of references: 51

Main heading: Soil pollution

Controlled terms: Plants (botany) - Seed - Soils

Uncontrolled terms: Bioconcentration factor - Contaminated soils - Growth indices - Lead-contaminated soil - Pb concentration - Pb-contaminated soil - Pb-free

Classification code: 483.1 Soils and Soil Mechanics - 821.4 Agricultural Products

DOI: 10.1007/s00128-021-03194-8

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

44. The swelling and transition behavior of thermo-responsive poly(2-(2-methoxyethoxy) ethoxyethyl methacrylate-co-poly (ethylene glycol) methyl ether methacrylate) thin films

Accession number: 20210809945051

Authors: Chen, Yangyi (1, 2); Wen, Wenjing (2); Su, Zhiqin (2); Qi, Huan (1, 2); Zhang, Chuyang (1, 2)

Author affiliation: (1) Engineering Technology Institute of ecological intelligent fabric in Shishi, Quanzhou Normal University, Quanzhou; 362000, China; (2) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Chen, Yangyi(yy@qztc.edu.cn)

Source title: Key Engineering Materials

Abbreviated source title: Key Eng Mat

Volume: 873 KEM

Part number: 1 of 1

Issue title: Material Engineering Research II - Selected peer-reviewed full text research paper from the 3rd International Conference on Material Engineering Research, ICMER 2020

Issue date: 2021

Publication year: 2021

Pages: 59-64

Language: English

ISSN: 10139826

E-ISSN: 16629795

CODEN: KEMAEY

ISBN-13: 9783035737127

Document type: Conference article (CA)

Conference name: 3rd International Conference on Material Engineering Research, ICMER 2020

Conference date: May 22, 2020 - May 24, 2020

Conference location: Incheon, Korea, Republic of

Conference code: 253699

Publisher: Trans Tech Publications Ltd

Abstract: Thermo-responsive random copolymer poly(2-(2-methoxyethoxy) ethoxyethyl methacrylate-co-poly(ethylene glycol) methyl ether methacrylate), abbreviated as P(MEO2MA-co- OEGMA300) was synthesized by 2-(2-methoxyethoxy) ethoxyethyl methacrylate (MEO2MA) and poly(ethylene glycol) methyl ether methacrylate (OEGMA300) with a molar ratio of 1:1 via atom transfer radical polymerization (ATRP). The structure of P(MEO2MA-co-OEGMA300) was confirmed by ¹H NMR and GPC. The transition behaviors of P(MEO2MA-co-OEGMA300) in aqueous solution were investigated by UV-Vis and DLS. While the transition behaviors of P(MEO2MA-co- OEGMA300) thin films were probed by white light interferometry. Compared to the well investigated poly(N-isopropylacrylamide), it shows a much broader transition region, which is suitable for the slow release of drug in the field of medicine. © 2021 Trans Tech Publications Ltd, Switzerland.

Number of references: 19

Main heading: Atom transfer radical polymerization

Controlled terms: Acrylic monomers - Aliphatic compounds - Amides - Engineering research - Ethers - Ethylene glycol - Free radical reactions - Molar ratio - Polyethylene glycols - Polyols - Thin films

Uncontrolled terms: Poly (n isopropylacrylamide) - Poly(ethylene glycol) methyl ether methacrylate (PEG-MMA) - Random copolymer - Slow release - Thermo-responsive - Transition behavior - Transition regions - White-light interferometry

Classification code: 802.2 Chemical Reactions - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 815.2 Polymerization - 901.3 Engineering Research

DOI: 10.4028/www.scientific.net/KEM.873.59

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

45. Machine vision problem for fast recognition of surface defects of thermoelectric cooler components based on deep learning method (Open Access)

Accession number: 20213810909501

Authors: Yu, Z.Q. (1); Zhao, M. (1); Huang, J.L. (2); Wen, T.X. (3); Liao, T.D. (4)

Author affiliation: (1) School of Computer Science and Engineering, Central South University, Changsha; 41000, China; (2) Faculty of Mathematics and Computer Science, Quanzhou Normal University, Fujian, Quanzhou; 362000, China; (3) College of Engineering, Huaqiao University, Fujian, Quanzhou; 362001, China; (4) Research Center for Photonics Technology, Quanzhou Normal University, Fujian, Quanzhou; 362000, China

Corresponding author: Yu, Z.Q.(yuz997@csu.edu.cn)

Source title: Journal of Physics: Conference Series

Abbreviated source title: J. Phys. Conf. Ser.

Volume: 2003

Part number: 1 of 1

Issue: 1

Issue title: 2021 International Conference on Artificial Intelligence, Automation and Algorithms, AI2A 2021

Issue date: August 27, 2021

Publication year: 2021

Article number: 012007

Language: English

ISSN: 17426588

E-ISSN: 17426596

Document type: Journal article (JA)

Conference name: 2021 International Conference on Artificial Intelligence, Automation and Algorithms, AI2A 2021

Conference date: July 23, 2021 - July 25, 2021

Conference location: Guilin, Virtual, China

Conference code: 171587

Publisher: IOP Publishing Ltd

Abstract: During thermoelectric coolers (TEC) production, a complex industrial manufacturing process must be experienced, which may cause defects on the surface of the TEC component. To improve the efficiency of TEC component defect inspection, we propose a machine vision technology based on deep learning for surface defect detection. In order to make the deep learning method based on the you only look once (YOLO) model more efficient, first of all, we use a more lightweight network ResNet34 to improve the original network structure. Then, the loss function is improved to complete intersection over union (CIoU) loss. Experiments performed using the proposed model, show an obvious reduction in the number of parameters, the detection speed is as high as 6.5pcs/s, and the detection accuracy is 97.61%. This method lay a good foundation for the further application of deep learning methods in the field of industrial detection. The experimental results verify the feasibility and effectiveness of the model. © Published under licence by IOP Publishing Ltd.

Number of references: 10

DOI: 10.1088/1742-6596/2003/1/012007

Compendex references: YES

Open Access type(s): All Open Access, Bronze

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

46. Broadband solar absorber based on square ring cross arrays of zns (Open Access)

Accession number: 20213210750465

Authors: Xu, Feng (1); Lin, Lixia (1); Fang, Jun (1); Huang, Mianli (1); Wang, Feng (2); Su, Jianzhi (2); Li, Shufen (2); Pan, Miao (2)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China; (2) College of Physics & Information Engineering, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Pan, Miao(miaopan2021@163.com)

Source title: Micromachines

Abbreviated source title: Micromachines

Volume: 12

Issue: 8

Issue date: August 2021

Publication year: 2021

Article number: 909

Language: English

E-ISSN: 2072666X

Document type: Journal article (JA)

Publisher: MDPI AG

Abstract: Solar energy is an inexhaustible clean energy. However, how to improve the absorption efficiency in the visible band is a long-term problem for researchers. Therefore, an electromagnetic wave absorber with an ultra-long absorption spectrum has been widely considered by researchers of optoelectronic materials. A kind of absorbing material based on ZnS material is presented in this paper. Our purpose is for the absorber to achieve a good and wide spectrum of visible light absorption performance. In the wide spectrum band (553.0 THz–793.0 THz) of the absorption spectrum, the average absorption rate of the absorber is above 94%. Using surface plasmon resonance (SPR) and gap surface plasmon mode, the metamaterial absorber was studied in visible light. In particular, the absorber is insensitive to both electric and magnetic absorption. The absorber can operate in complex electromagnetic environments and at high temperatures. This is because the absorber is made of refractory metals. Finally, we discuss and analyze the influence of the parameters regulating the absorber on the absorber absorption efficiency. We have tried to explain why the absorber can produce wideband absorption. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

Number of references: 65

Main heading: Solar absorbers

Controlled terms: Absorption spectroscopy - II-VI semiconductors - Light - Light absorption - Optoelectronic devices - Plasmonic metamaterials - Refractory metals - Solar energy - Surface plasmon resonance - Zinc sulfide

Uncontrolled terms: Absorption efficiency - Electromagnetic environments - Electromagnetic wave absorber - Gap surface plasmons - Magnetic absorption - Metamaterial absorbers - Opto-electronic materials - Visible light absorption

Classification code: 531 Metallurgy and Metallography - 657.1 Solar Energy and Phenomena - 741.1 Light/Optics - 741.3 Optical Devices and Systems - 804.2 Inorganic Compounds

Numerical data indexing: Percentage 9.40e+01%

DOI: 10.3390/mi12080909

Funding Details: Number: JZ160456, Acronym: -, Sponsor: -; Number: 2020C004R, 2020C044R, Acronym: -, Sponsor: -; Number: 21676222, U175252, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019I0017, 2019J01732, JAT200552, JT180365, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: 2018C128R, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: Acknowledgments: This work was supported by the National Natural Science Foundation of China (21676222, U175252), the Natural Science Foundation of Fujian Province (2019I0017, 2019J01732, JT180365, JAT200552), the Major Program of Natural Science Foundation of Fujian Province for College Young Scholars (No. JZ160456), the Quanzhou high-level Talents Innovation and Entrepreneurship Project (2020C044R, 2020C004R), and the Quanzhou Science and Technology Project (2018C128R). This work was supported by the National Natural Science Foundation of China (21676222, U175252), the Natural Science Foundation of Fujian Province (2019I0017, 2019J01732, JT180365, JAT200552), the Major Program of Natural Science Foundation of Fujian Province for College Young Scholars (No. JZ160456), the Quanzhou high-level Talents Innovation and Entrepreneurship Project (2020C044R, 2020C004R), and the Quanzhou Science and Technology Project (2018C128R).

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

47. Novel extraction methods and potential applications of polyphenols in fruit waste: a review

Accession number: 20211510185215

Authors: Cai, Hongli (1); You, Siyong (2, 3); Xu, Zhiying (4); Li, Zhanming (4); Guo, Juanjuan (2, 3); Ren, Zhongyang (4); Fu, Caili (2, 5)

Author affiliation: (1) College of Life Sciences and Medicine, Zhejiang Sci-Tech University, Hangzhou; 310018, China; (2) College of Oceanology and Food Science, Quanzhou Normal University, Quanzhou; 362000, China; (3) Key Laboratory of Inshore Resources Biotechnology (Quanzhou Normal University), Fujian Province University, Quanzhou; 362000, China; (4) School of Grain Science and Technology, Jiangsu University of Science and Technology, Zhenjiang; Jiangsu; 212004, China; (5) College of Biological Sciences and Engineering, Fuzhou University, Fuzhou; Fujian; 350108, China

Corresponding authors: Guo, Juanjuan(gjfst15@163.com); Li, Zhanming(lizhanming@just.edu.cn)

Source title: Journal of Food Measurement and Characterization

Abbreviated source title: J. Food Meas. Charact.

Volume: 15

Issue: 4

Issue date: August 2021

Publication year: 2021

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Language: English

ISSN: 21934126

E-ISSN: 21934134

Document type: Journal article (JA)

Publisher: Springer

Abstract: During fruit waste processing, bioactive compounds can be lost along with waste, and thus it is necessary to recover these bioactive compounds. Recently, the extraction of polyphenols from fruit waste and the stabilization and integration of these compounds into food substances has become a valuable research field. Polyphenols have strong antioxidant, anti-inflammatory, and antibacterial activity and are the main active components of fruit waste. Their extraction from fruit waste is of great commercial and scientific significance. The extraction of polyphenols from fruit waste, the stabilization of their bioactivities, and their integration into the food matrix have become increasingly interesting topics. In this review, the novel extraction methods and potential applications of fruit waste polyphenols were summarized to inform the recovery and utilization of polyphenols in fruit waste. The comprehensive utilization of byproducts from food industry is beneficial to the reduction of food costs, the alleviation of environmental contamination, and the realization of food industry sustainability. © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

Number of references: 138

Main heading: Fruits

Controlled terms: Extraction - Stabilization - Sustainable development

Uncontrolled terms: Active components - Anti-bacterial activity - Anti-inflammatories - Bioactive compounds - Comprehensive utilizations - Environmental contamination - Recovery and utilizations - Waste processing

Classification code: 802.3 Chemical Operations - 821.4 Agricultural Products

DOI: 10.1007/s11694-021-00901-1

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

48. Design of Grating Type GaAs Solar Absorber and Investigation of Its Photoelectric Characteristics (Open Access)

Accession number: 20214611144192

Authors: Huang, Meihong (1); Wei, Kaihua (2); Wu, Pinghui (3); Xu, Danyang (4); Xu, Yan (5)

Author affiliation: (1) College of Transportation and Navigation, Quanzhou Normal University, Quanzhou, China; (2) School of Automation, Hangzhou Dianzi University, Hangzhou, China; (3) Fujian Provincial Key Laboratory for Advanced Micro-nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou, China; (4) College of Science, Zhejiang University of Technology, Hangzhou, China; (5) School of Science, Huzhou University, Huzhou, China

Corresponding author: Xu, Yan(xuyanhzu@126.com)

Source title: Frontiers in Materials

Abbreviated source title: Front. Mater.

Volume: 8

Issue date: October 25, 2021

Publication year: 2021

Article number: 781803

Language: English

E-ISSN: 22968016

Document type: Journal article (JA)

Publisher: Frontiers Media S.A.

Abstract: In recent years, as a renewable clean energy with many excellent characteristics, solar energy has been widely concerned. In this paper, we propose an ultra-broadband solar absorber based on metal tungsten and semiconductor GaAs structure. A multilayer metal semiconductor composite structure composed of W-Ti-GaAs three-layer films and GaAs gratings is proposed. The finite difference time domain method is used to simulate the performance of the proposed model. High efficiency surface plasmon resonance is excited by adjusting the geometric parameters, and the broadband absorption of up to 2,350 nm in 500–2850 nm is realized. The spectrum of the structure can be changed by adjusting the geometric parameters to meet different needs. The proposed absorber has good oblique incidence characteristics (0–60°) and high short-circuit current characteristics. The geometry of the absorber is clear, easy to manufacture, and has good photoelectric performance. It can realize solar energy collection, light heat conversion, high sensitive sensing and other functions. Copyright © 2021 Huang, Wei, Wu, Xu and Xu.

Number of references: 53

Main heading: III-V semiconductors

Controlled terms: Composite films - Finite difference time domain method - Gallium arsenide - Geometry - Photoelectricity - Semiconducting gallium - Semiconducting gallium arsenide - Solar absorbers - Solar energy - Surface plasmon resonance - Titanium compounds

Uncontrolled terms: Broadband absorption - Clean energy - Composites structures - Gaas grating - Metal semiconductors - Performance - Photoelectric characteristics - Semiconductor composite - Three-layer film - Ultra-broadband

Classification code: 657.1 Solar Energy and Phenomena - 701.1 Electricity: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 712.1.1 Single Element Semiconducting Materials - 712.1.2 Compound Semiconducting Materials - 741.1 Light/Optics - 804 Chemical Products Generally - 813.2 Coating Materials - 921 Mathematics

Numerical data indexing: Size 2.35E-06m, Size 2.85E-06m

DOI: 10.3389/fmats.2021.781803

Funding Details: Number: 11704223,61705056, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: JAT190534, Acronym: -, Sponsor: Department of Education, Fujian Province; Number:

LGF20F050004, Acronym: ZJNSF, Sponsor: Natural Science Foundation of Zhejiang Province; Number: KYY-HX-20210657, Acronym: ZJUT, Sponsor: Zhejiang University of Technology; Number: Y202146019, Acronym: ZPDE, Sponsor: Department of Education of Zhejiang Province;

Funding text: This work was supported by the National Natural Science Foundation of China (NSFC) (11704223 and 61705056), Zhejiang Provincial Natural Science Foundation of China (LGF20F050004), Research Project of Zhejiang

Provincial Department of Education (Y202146019), Research Project of Fujian Provincial Department of Education (JAT190534), Science and Technology Project of Zhejiang University of Technology (KYY-HX-20210657).

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

49. Terahertz broadband absorber based on a combined circular disc structure

Accession number: 20214411095412

Authors: Huang, Meihong (1); Wei, Kaihua (2); Wu, Pinghui (3); Xu, Danyang (4); Xu, Yan (5)

Author affiliation: (1) College of Transportation and Navigation, Quanzhou Normal University, Quanzhou; 362000, China; (2) School of Automation, Hangzhou Dianzi University, Hangzhou; 310018, China; (3) Fujian Provincial Key Laboratory for Advanced Micro-nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou; 362000, China; (4) College of Science, Zhejiang University of Technology, Hangzhou; 310023, China; (5) School of Science, Huzhou University, Huzhou; 313000, China

Corresponding author: Xu, Yan(xuyanhzu@126.com)

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Abbreviated source title: Micromachines

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Publication year: 2021

Article number: 1290

Language: English

E-ISSN: 2072666X

Document type: Journal article (JA)

Publisher: MDPI

Abstract: To solve the problem of complex structure and narrow absorption band of most of today's terahertz absorbers, this paper proposes and utilizes the finite element (COMSOL) method to numerically simulate a broadband absorber based on a straightforward periodic structure consisting of a disk and concentric ring. The final results show that our designed absorber has an absorption rate of over 99% in the broadband range of 9.06 THz to 9.8 THz and an average of over 97.7% in the ultra-broadband range of 8.62 THz to 10 THz. The reason for the high absorption is explained by the depiction of the electric field on the absorber surface at different frequencies. In addition, the materials for the top pattern of the absorber are replaced by Cu, Ag, or Al, and the absorber still achieves perfect absorption with different metal materials. Due to the perfect symmetry of the absorber structure, the absorber is very polarization-insensitive. The overall design is simple, easy to process and production. Therefore, our research will offer great potential for applications in areas such as terahertz electromagnetic stealth, sensing, and thermal imaging. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

Number of references: 63

Main heading: Infrared imaging

Controlled terms: Electric fields - Polarization

Uncontrolled terms: Broadband - Broadband absorbers - Circular discs - Complexes structure - Concentric rings - Disc structures - Perfect absorption - Polarization-insensitive - Ring-disk structure - Tera Hertz

Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 746 Imaging Techniques

Numerical data indexing: Frequency 8.62E+12Hz to 1.00E+13Hz, Frequency 9.06E+12Hz to 9.80E+12Hz, Percentage 9.77E+01%, Percentage 9.90E+01%

DOI: 10.3390/mi12111290

Funding Details: Number: 11704223, Acronym: NNSFC, NNSF, NSF, NSFC, Sponsor: National Natural Science Foundation of China; Number: 61705056, Acronym: NNSFC, NNSF, NSF, NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This work was supported by the National Natural Science Foundation of China (NSFC) (11704223, 61705056), Zhejiang Provincial Natural Science Foundation of China (LGF20F050004), Research Project of Zhejiang Provincial Department of Education (Y202146019), Research Project of Fujian Provincial Department of Education (JAT190534), Science and Technology Project of Zhejiang University of Technology (KYY-HX-20210657).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

50. Polarization selection characteristics of carbon fiber orientation and interweaving for electromagnetic interference shielding behaviors

Accession number: 20213110711981

Authors: Hong, Xinghua (1, 2); Zhong, Lulu (1, 2); Wan, Junmin (2); Li, Yongqiang (1, 2); Guan, Fuwang (3); Wang, Guohao (4); Zhu, Chengyan (1, 2); Jin, Zimin (1)

Author affiliation: (1) College of Textiles (International Silk Institute), Zhejiang Sci-Tech University, Key Laboratory of Advanced Textile Materials and Manufacturing Technology, Ministry of Education, Zhejiang Sci-Tech University, China; (2) Zhejiang Sci-tech University Tongxiang Research Institute, China; (3) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou Normal University, China; (4) Quzhou Acme Science and Technology Co, Ltd, China

Corresponding author: Zhu, Chengyan(cyzhu@zstu.edu.cn)

Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Article in Press

Publisher: SAGE Publications Ltd

Abstract: In this paper, to determine the impact of carbon fiber orientation and interweaving on electromagnetic interference (EMI) shielding behaviors, anisotropic and isotropic samples were developed by conductive/dielectric weaving of spatially distributed carbon fiber and glass fiber. Effortless and cost-effective, the electromagnetic shielding efficiency (SE) was up to 42 dB and the SE/thickness was 41 dB/mm, which had apparent polarization selection characteristics. In addition, the angle (θ) sensitivity for the SE in transverse electric and transverse magnetic polarization modes was given in detail. SE was generally proportional to θ . Moreover, the fingerprint-like radar chart of anisotropic carbon hybrid woven fabrics in the X-band was performed, which makes polarization selection characteristics more intuitive. This paper presented an easy and effective route for assembling hybrid carbon fiber fabrics with high EMI shielding performance, which offers a clear perspective on the simulation and study of carbon fiber electromagnetic properties. © The Author(s) 2021.

Number of references: 54

Main heading: Electromagnetic shielding

Controlled terms: Anisotropy - Cost effectiveness - Electromagnetic pulse - Electromagnetic wave interference - Fibers - Graphite fibers - Polarization - Shielding - Signal interference - Weaving

Uncontrolled terms: Carbon fiber fabrics - Cost effective - Electromagnetic interference shielding - Electromagnetic properties - Isotropic samples - Transverse electrics - Transverse magnetic polarization - Woven fabrics

Classification code: 701 Electricity and Magnetism - 711 Electromagnetic Waves - 716.1 Information Theory and Signal Processing - 819.5 Textile Products and Processing - 911.2 Industrial Economics - 931.2 Physical Properties of Gases, Liquids and Solids

Numerical data indexing: Decibel 4.20e+01dB

DOI: 10.1177/00405175211034248

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

51. Effects of the indium tin oxide/perovskite interface on the photocurrent amplification of perovskite photodetectors

Accession number: 20204909571547

Authors: Wang, Lidan (1); Su, Zisheng (2); Wu, Hairuo (3, 4); Chu, Bei (3)

Author affiliation: (1) College of Chemical Engineering and Material, Quanzhou Normal University, Quanzhou; 362000, China; (2) College of Physics and Information Engineering, Key Laboratory of Information Functional Material for Fujian Higher Education and Fujian Key Laboratory for Advanced Micro-nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou; 362000, China; (3) State Key Laboratory of Luminescence and Applications, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun; 130033, China; (4) University of Chinese Academy of Sciences, Beijing; 100039, China

Corresponding author: Su, Zisheng(suzs@qztc.edu.cn)

Source title: Synthetic Metals

Abbreviated source title: Synth Met

Volume: 271

Issue date: January 2021

Publication year: 2021

Article number: 116636

Language: English

ISSN: 03796779

CODEN: SYMEDZ

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Perovskite photodetectors processing a photocurrent amplification have attracted much attention due to their high response to light illumination and have been exploited in a regular device geometry. Here, photocurrent amplification is demonstrated in an inverted perovskite photodetector, and the effect of the indium tin oxide (ITO)/perovskite interface on the photocurrent amplification factor are exploited. It is found that the photocurrent amplification is limited by the ITO/perovskite interface, which can be proved by the devices with bare ITO, Cu₂O particles partially covered ITO, and poly(3,4-ethylene dioxythiophene):poly(styrene sulfonate) fully covered ITO as the anodes. A photocurrent amplification factor of about 27 is demonstrated in the perovskite photodetector with a bare ITO as the anode, which is one of the highest ones among the reported perovskite photodetectors. It also exhibits a maximum response of 4.1 A/W and a detectivity of 10¹¹ Jones. Compared with the bare ITO device, the photocurrent amplification of the devices decreases gradually with the reduced contact area between ITO and perovskite and eventually disappears when the direct contact is totally removed. The photocurrent amplification is attributed to the long-lived accumulated holes as well as the positively charged CH₃NH₃⁺ and I vacancy at the ITO/perovskite interface, which dramatically lowers the injection barrier of electrons and leads to a multiple electron injection. © 2020

Number of references: 40

Main heading: Photocurrents

Controlled terms: Anodes - Copper oxides - Indium compounds - Perovskite - Photodetectors - Photons - Styrene - Tin oxides

Uncontrolled terms: Device geometries - Indium tin oxide - Injection barriers - Light illumination - Photocurrent amplification - Poly(3,4-ethylenedioxythiophene) - Poly(styrene sulfonate) - Positively charged

Classification code: 482.2 Minerals - 701.1 Electricity: Basic Concepts and Phenomena - 714.1 Electron Tubes - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 931.3 Atomic and Molecular Physics

DOI: 10.1016/j.synthmet.2020.116636

Funding Details: Number: 2019C015R,2020C025R, Acronym: -, Sponsor: -; Number: 61504145, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019J01729,2020J01778, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: -, Acronym: NCET, Sponsor: Program for New Century Excellent Talents in University;

Funding text: This work was supported by the National Natural Science Foundation of China (61504145), the Natural Science Foundation of Fujian Province (2019J01729 and 2020J01778), the Science and Technology Development Plan of Quanzhou (2019C015R and 2020C025R), and the Program for New Century Excellent Talents in Fujian Province University, China .

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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52. Transparent ultraviolet-shielding composite films made from dispersing pristine zinc oxide nanoparticles in low-density polyethylene (Open Access)

Accession number: 20210309787545

Authors: Cui, Lina (1, 2); Huang, Canyi (1, 2); Xia, Hong (3); Qiu, Yiping (4, 5); Ni, Qing-Qing (4, 6)

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Source title: Nanotechnology Reviews

Abbreviated source title: Nanotechnol. Rev.

Volume: 9

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Publication year: 2021

Pages: 1368-1380

Language: English

ISSN: 21919089

E-ISSN: 21919097

Document type: Journal article (JA)

Publisher: De Gruyter Open Ltd

Abstract: This work proposes an approach to fabricate flexible transparent ultraviolet (UV)-shielding membrane by casting method, which uniformly disperses pristine zinc oxide nanoparticles (NPs) in low-density polyethylene (LDPE). The critical conditions for film fabrication, such as casting temperature, LDPE concentration in the solution, dissolution time, NP concentration, and post hot press cooling processes, are systematically studied. It is found that the casting temperature needs to be close to the melting temperature of LDPE, namely, 115°C, so that transparent film formation without cracks can be guaranteed. NP agglomerates are suppressed if the polymer concentration is controlled below 6%. For good dispersion of NPs, LDPE has to be swelled or unentangled enough in the solution (close to 200 h dissolution time), and then the NP agglomerates can be diminished due to the diffusion of the NPs into the polymer gel (322 h dissolution time). When the NPs are well-dispersed in the LDPE film, the film can completely shield UV light while allowing high transmissivity for the visible light. As the concentration of NPs in the film increases from 4 to 6%, the transmissivity of the film decreases, the tensile strength increases, and the tensile failure strain decreases. © 2020 Lina Cui et al., published by De Gruyter.

Number of references: 52

Main heading: Nanocomposite films

Controlled terms: Agglomeration - Aliphatic compounds - Dissolution - II-VI semiconductors - Light - Nanoparticles - Oxide films - Polyethylenes - Shielding - Tensile strength - Zinc castings - Zinc oxide - ZnO nanoparticles

Uncontrolled terms: Casting temperatures - Critical condition - Low density polyethylene(LDPE) - Polymer concentrations - Shielding composite - Strength increase - Transparent films - Zinc oxide nanoparticles

Classification code: 534.2 Foundry Practice - 712.1 Semiconducting Materials - 741.1 Light/Optics - 761

Nanotechnology - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 815.1.1 Organic Polymers - 933 Solid State Physics

Numerical data indexing: Percentage 4.00e+00% to 6.00e+00%, Percentage 6.00e+00%, Temperature 3.88e+02K, Time 1.16e+06s, Time 7.20e+05s

DOI: 10.1515/ntrev-2020-0099

Funding Details: Number: JA14265, JT1808378, Acronym: -, Sponsor: -; Number: 20H00288, 26420721, Acronym: KAKEN, Sponsor: Japan Society for the Promotion of Science; Number: 2016Z071, 2017ZT001, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: This research was funded by Education Department Research Program of Fujian Province (CN) [No. JA14265 and JT1808378], Minjiang Chair Professor Program of Fujian Province (CN) [No. 2018(56)], Science & Technology Program of Quanzhou City (CN) [No. 2016Z071 and No. 2017ZT001], and Japan Government Funding [JSPS KAKENHI No. 20H00288 and 26420721]. We would like to thank Profs. Shuiyuan Luo, Xiangyang Liu, and Tingdi Liao, Dr Hairong Chen, Ms Xiaoyu Han, Jia Song, and Jingjing Gao for their help in preparing the material and carrying out the experiment.

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

53. Evaluation of temperature on the biological activities and fertility potential during vermicomposting of pig manure employing *Eisenia fetida*

Accession number: 20211610219983

Authors: Zhou, Yong (1, 2); Zhang, Dan (3); Zhang, Yunfeng (1, 2); Ke, Jingshi (2); Chen, Deli (2); Cai, Minggang (4)

Author affiliation: (1) School of Resources & Environmental Sciences, Quanzhou Normal University, Quanzhou; 362000, China; (2) Fujian Key Laboratory of Rural Environmental Improvement and Waste Recycling, Quanzhou Normal University, Quanzhou; 362000, China; (3) School of Energy & Environment, Zhongyuan University of Technology, Zhengzhou; 450007, China; (4) College of Ocean and Earth Sciences, Xiamen University, Xiamen; 361102, China

Corresponding authors: Zhou, Yong(Jow@hust.edu.cn); Cai, Minggang(mgcai@xmu.edu.cn)

Source title: Journal of Cleaner Production

Abbreviated source title: J. Clean. Prod.

Volume: 302

Issue date: June 15, 2021

Publication year: 2021

Article number: 126804

Language: English

ISSN: 09596526

CODEN: JCROE8

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: In this laboratory-scale study, the biological activities and vermicomposting potential of *Eisenia fetida* in pig manure were investigated to evaluate the influence of temperature (10°C–50 °C) on vermicomposting effect. The enzyme activities of catalase (CAT), peroxidase (POD), superoxide dismutase (SOD), and the content of malondialdehyde (MDA) in earthworm, macro-nutrients (N, P, K), total organic carbon (TOC), humification index (HIX) and C/N ratio in pig manure have been investigated simultaneously. Results revealed that CAT activity elevated initially and then declined with the increased temperature. The increased POD, SOD activity and MDA content indicated the antioxidant stress response of earthworm and the optimum temperature was found at 30 °C. After vermicomposting the pig manure for 60 d under temperature range of 10°C–50 °C, the vermicompost exhibited a significant increase in macro-nutrients, whereas a reduction was observed in TOC, C/N ratio and HIX, reflecting the efficient decomposition of organic waste driven by earthworms and microorganisms synergistically. The result of total microbial population showed the increase of actinomycetes and bacterial population. The enhancement percentage was in the order: 30 °C > 40 °C > 50 °C > 20 °C > 10 °C, revealing the impact of temperature. The results indicated the advantage of vermicomposting with *Eisenia fetida* and the regulation mechanism of temperature on the vermicomposting effect of pig manure. The present study will benefit to the utilization of agricultural wastes and achieving environmental sustainability. © 2021 Elsevier Ltd

Number of references: 46

Main heading: Enzyme activity

Controlled terms: Bacteria - Bioactivity - Fertilizers - Mammals - Manures - Nutrients - Organic carbon - Sustainable development

Uncontrolled terms: C:N ratio - Catalase-peroxidase - *Eisenia fetida* - Enzymes activity - Humification index - Macro nutrients - Malondialdehyde - Pig manures - Total Organic Carbon - Vermi-composting

Classification code: 461.6 Medicine and Pharmacology - 461.9 Biology - 804 Chemical Products Generally - 804.1 Organic Compounds - 821.2 Agricultural Chemicals - 821.5 Agricultural Wastes

Numerical data indexing: Temperature 3.23E+02K, Temperature 2.83E+02K, Temperature 2.93E+02K, Temperature 3.03E+02K, Temperature 3.13E+02K

DOI: 10.1016/j.jclepro.2021.126804

Funding Details: Number: -, Acronym: QNU, Sponsor: Quanzhou Normal University; Number: 2018N005, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: We express our sincere thanks to Mr. Changkang Deng and Miss Yidi Wu of Fujian SMIC Environmental Testing Co. Ltd. for their skillful technical assistance. This work was supported in part by grants from Quanzhou City Science & Technology Program of China (2018N005), and the Advanced Science Talent (AST) Project of Quanzhou Normal University. We express our sincere thanks to Mr. Changkang Deng and Miss Yidi Wu of Fujian SMIC Environmental Testing Co., Ltd. for their skillful technical assistance. This work was supported in part by grants from Quanzhou City Science & Technology Program of China (2018N005), and the Advanced Science Talent (AST) Project of Quanzhou Normal University .

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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54. Effect of heat pretreatment before isoelectric solubilisation/precipitation on the characteristics of Pacific oyster (*Crassostrea hongkongensis*) and Antarctic krill (*Euphausia superba*) protein isolates

Accession number: 20203409078101

Authors: Zheng, Huina (1, 2, 3); Shiming, Liang (1); Gaozhan, Xue (1); Dingding, Ren (1); Wenhong, Cao (1, 2, 3); Chaohua, Zhang (1, 2, 3, 4); Jianjun, Yuan (4, 5)

Author affiliation: (1) College of Food Science and Technology, Guangdong Ocean University, Zhanjiang; 524088, China; (2) Shenzhen Institute of Guangdong Ocean University, Shenzhen; 518116, China; (3) Guangdong Provincial Key Laboratory of Aquatic Products Processing and Safety, Zhanjiang; 524088, China; (4) Key Laboratory of Inshore

Resources Biotechnology (Quanzhou Normal University), Fujian Province University, Quanzhou; 362000, China; (5) College of Oceanology and Food Science, Quanzhou Normal University, Quanzhou; 362000, China
Corresponding authors: Zheng, Huina(margaretpaper@126.com); Zheng, Huina(margaretpaper@126.com); Zheng, Huina(margaretpaper@126.com); Jianjun, Yuan(yuanjianjun2005@qztc.edu.cn); Jianjun, Yuan(yuanjianjun2005@qztc.edu.cn)

Source title: International Journal of Food Science and Technology

Abbreviated source title: Int. J. Food Sci. Technol.

Volume: 56

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Publication year: 2021

Pages: 682-691

Language: English

ISSN: 09505423

E-ISSN: 13652621

Document type: Journal article (JA)

Publisher: Blackwell Publishing Ltd

Abstract: Heat treatment is a convenient way to eliminate the effects of endogenous enzymes on the industrial production of stable products. This study describes the preparation of protein isolates from oysters (OPI and HOPI) and krill (KPI and HKPI) by isoelectric solubilisation/precipitation (ISP) with or without heat pretreatment and comparatively presents their characteristics. The results showed that the solubilities of HOPI ($24.08 \pm 1.94\%$) and HKPI ($42.29 \pm 0.78\%$) were higher than those of OPI ($13.46 \pm 0.78\%$) and KPI ($21.71.46 \pm 1.51\%$), and the free and total sulphhydryl (-SH) content and surface hydrophobicity of HOPI and HKPI were higher than those of OPI and KPI, which are related to higher fat content of HOPI ($10.37 \pm 0.55\%$) and HKPI ($34.89 \pm 1.19\%$). SDS-PAGE and gel chromatography pattern results showed that macromolecular proteins were degraded by endogenous enzymes in OPI and KPI, while they remained unaffected in HOPI and HKPI. The FT-IR spectra showed similar patterns between OPI and HOPI and between KPI and HKPI. While the essential amino acid content was similar for OPI and HOPI ($47.06 \pm 1.33\%$ and $47.93 \pm 1.02\%$), that of KPI and HKPI ($50.89 \pm 0.89\%$ and $51.19 \pm 1.11\%$, respectively) was not significantly different. © 2020 Institute of Food Science and Technology

Number of references: 35

Main heading: Benchmarking

Controlled terms: Enzymes - Molluscs - Shellfish - Solubility

Uncontrolled terms: Endogenous enzyme - Essential amino acids - Euphausia superba - Gel chromatography - Heat pretreatment - Industrial production - Protein isolates - Surface hydrophobicity

Classification code: 461.9 Biology - 471 Marine Science and Oceanography - 801.4 Physical Chemistry

DOI: 10.1111/ijfs.14702

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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55. Resistance Between Two Nodes of a Ring Clique Network

Accession number: 20214110999913

Authors: Li, Shuli (1); Tian, Tao (2)

Author affiliation: (1) School of Mathematical and Computer Sciences, Quanzhou Normal University, Quanzhou; 362000, China; (2) College of Mathematics and Informatics, Fujian Normal University, Fuzhou; 350117, China

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Source title: Circuits, Systems, and Signal Processing

Abbreviated source title: Circ Syst Signal Process

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 0278081X

E-ISSN: 15315878

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Document type: Article in Press

Publisher: Birkhauser

Abstract: The resistance between two nodes in some resistor networks has been studied extensively by mathematicians and physicists. Given n positive integers a_1, a_2, \dots, a_n , let $H[a_i]_{1n}$ be the resistor network obtained from the complete graphs K_n by adding edges connecting every vertex in K_n to every vertex in K_{n-1} and K_{n+1} ,

where $i = 1, 2, \dots, n$, $K_{n+1} = K_n$, with a unit resistor between arbitrary two adjacent nodes in $H[a_i]1n$. In this paper, using the elimination and substitution principles and some equivalent transformations in electrical circuit, we obtain explicit formula for the resistance between arbitrary two nodes of $H[a_i]1n$. © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

Number of references: 30

Main heading: Resistors

Controlled terms: Graph theory

Uncontrolled terms: A-RINGS - Complete graphs - Double stars - $K_{m,n}$ -double star transform - Network - Positive integers - Principle of elimination - Principle of substitution - Resistance - Resistor network

Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory

DOI: 10.1007/s00034-021-01859-7

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

56. Erratum: A comparative study on sulfide removal by HClO and KMnO₄ in drinking water (Environ. Sci.: Water Res. Technol. (2020) 6 (2871–2880) DOI: 10.1039/D0EW00629G) ([Open Access](#))

Accession number: 20210209763606

Authors: Huang, Yeju (1); Liu, Zaohong (1); Guo, Yuanyuan (1); Lin, Qin (1); Liao, Xiaobin (1); Qi, Huan (2)

Author affiliation: (1) Institute of Municipal and Environmental Engineering, College of Civil Engineering, Huaqiao University, Fujian; 361021, China; (2) College of Textiles and Apparel, Quanzhou Normal University, Fujian; 362002, China

Corresponding author: Qi, Huan(qhqh123@126.com)

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Abbreviated source title: Environ. Sci. Water Res. Technol.

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Document type: Erratum (ER)

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Abstract: The following sentence of acknowledgement was inadvertently missing from the Funding information section of this manuscript: Subsidized Project for Postgraduates' Innovative Fund in Scientific Research of Huaqiao University. The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers. © 2021 Royal Society of Chemistry. All rights reserved.

DOI: 10.1039/d0ew90057e

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Open Access type(s): All Open Access, Hybrid Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

57. Tunable synthesis of chalcophosphinic amides and tertiary phosphinates using: Tert-butyl N, N-dialkylperoxyamidate

Accession number: 20213510835717

Authors: Liu, Kun (1); Chang, Xuexue (1); He, Yimiao (1); Su, Zhongfu (1); Huang, Yanmin (1); Huang, Chusheng (1); Lei, Jian (2); Zhu, Qiang (1)

Author affiliation: (1) Guangxi Key Laboratory of Natural Polymer Chemistry and Physics, College of Chemistry and Materials, Nanning Normal University, Nanning; 530001, China; (2) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Source title: Organic Chemistry Frontiers

Abbreviated source title: Org. Chem. Front.

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Pages: 4860-4864

Language: English

ISSN: 20524110

E-ISSN: 20524129

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: The tunable synthesis of chalcophosphinic amides and phosphinates via a copper-catalyzed reaction between phosphine chalcogenides and tert-butyl N,N-dialkylperoxyamidate has been developed. Tert-Butyl N,N-dialkylperoxyamidate plays a dual role as a secondary amine and a tertiary alcohol precursor in this transformation, without the need for additional oxidants, bases or other additives. Chalcophosphinic amides were accessed under catalysis with CuI in CH₂Cl₂, while tert-butyl chalcophosphinates were generated with the aid of catalytic Cu(OAc)₂ in THF, which were difficult to obtain by previous methods. © the Partner Organisations.

Number of references: 42

Main heading: Iodine compounds

Controlled terms: Additives - Amides - Amines - Catalysis - Copper compounds - Dichloromethane - Phosphorus compounds

Uncontrolled terms: Copper-catalyzed reactions - Dual role - Phosphinates - Secondary amines - Tertiary alcohols

Classification code: 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds

DOI: 10.1039/d1qo00542a

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

58. Feature extraction based on Gabor filter and Support Vector Machine classifier in defect analysis of Thermoelectric Cooler Component

Accession number: 20212010363692

Authors: Zhao, Ming (1); Qiu, Weiyu (1); Wen, Tingxi (2); Liao, Tingdi (3); Huang, Jianlong (4, 5, 6)

Author affiliation: (1) School of Computer Science And Engineering, Central South University, Changsha; 41000, China; (2) College of Engineering, Huaqiao University, Quanzhou; Fujian; 362001, China; (3) Research Center for Photonics Technology, Quanzhou Normal University, Quanzhou; Fujian; 362000, China; (4) School of Mathematics and Computer Science, Quanzhou Normal University, Quanzhou; 362001, China; (5) Fujian Provincial Key Laboratory of Data-Intensive Computing, Quanzhou; 362001, China; (6) Key Laboratory of Intelligent Computing and Information Processing, Fujian Province University, Quanzhou; 362001, China

Corresponding author: Huang, Jianlong(robotics@qztc.edu.cn)

Source title: Computers and Electrical Engineering

Abbreviated source title: Comput Electr Eng

Volume: 92

Issue date: June 2021

Publication year: 2021

Article number: 107188

Language: English

ISSN: 00457906

CODEN: CPPEBQ

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Purpose: During the slicing process, thermoelectric cooler (TEC) component are prone to cause various defects, such as cracks, pockmarks, and other defects of various shapes and sizes. The presence of these surface defects will lead to a decline in product performance. At present, the method of screening TEC component is mainly manual detection. This method is affected by the strong subjectivity of human beings and the limited spatial resolution. Therefore, a method based on machine learning is proposed to overcome the above shortcomings and obtain product accuracy that is difficult for artificial vision to achieve Method: We use Gabor filters to extract texture information in

the TEC component image and use it as a classification feature. At the same time, principal component analysis (PCA) is used to select the classification features. For the number of defect types, we use support vector machine (SVM) to classify unknown defects. By extracting the features of the TEC component image and using it for SVM training. Finally, the unknown defect image is used as input to obtain the defect category Results: By testing the TEC simultaneously with other machine learning methods in this paper, the superiority of this method is proved. At the same time, it also overcomes a series of problems such as slow manual detection speed, low reliability, poor consistency and stability of test results, product quality cannot be improved, and low detection efficiency Conclusion: Based on our experimental analysis, the proposed method can effectively improve the classification effect of TEC component defects. Compared with other classifiers, the effectiveness of this method is further verified. © 2021

Number of references: 25

Main heading: Classification (of information)

Controlled terms: Cooling systems - Feature extraction - Gabor filters - Principal component analysis - Quality control - Reliability analysis - Support vector machines - Surface defects - Textures - Thermoelectric equipment

Uncontrolled terms: Classification features - Defect analysis - Defect classification - Features extraction - Filter vectors - Machine-learning - Principal-component analysis - Support vector machine classifiers - Support vectors machine - Thermoelectric cooler

Classification code: 615.4 Thermoelectric Energy - 703.2 Electric Filters - 716.1 Information Theory and Signal Processing - 723 Computer Software, Data Handling and Applications - 903.1 Information Sources and Analysis - 913.3 Quality Assurance and Control - 922.2 Mathematical Statistics - 951 Materials Science

DOI: 10.1016/j.compeleceng.2021.107188

Funding Details: Number: 2020JJ4757, Acronym: -, Sponsor: Natural Science Foundation of Hunan Province;

Funding text: The authors would like to acknowledge the support by Fujian Provincial Key Laboratory of Data-Intensive Computing, Fujian University Laboratory of Intelligent Computing and Information Processing, and Fujian Provincial Big Data Research Institute of Intelligent Manufacturing. The authors would also like to acknowledge the Fujian Provincial Science and Technology Major Project 2019 (Project No. 2019HZ020010) and the Natural Science Foundation of Hunan Province (Project No. 2020JJ4757).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

59. Interactive design platform for pant denim development

Accession number: 20214511128703

Authors: Han, Xiao-Yu (1); Lin, Qi (1)

Author affiliation: (1) Quanzhou Normal University, Donghai Street No398, Fengze Distict, Quanzhou; 362000, China

Corresponding authors: Han, Xiao-Yu(hxyjyl23@126.com); Lin, Qi(740662924@qq.com)

Source title: Textile Bioengineering and Informatics Symposium Proceedings 2021 - 14th Textile Bioengineering and Informatics Symposium, TBIS 2021

Abbreviated source title: Text. Bioeng. Informatics Symp. Proc. - Text. Bioeng. Informatics Symp., TBIS

Part number: 1 of 1

Issue title: Textile Bioengineering and Informatics Symposium Proceedings 2021 - 14th Textile Bioengineering and Informatics Symposium, TBIS 2021

Issue date: 2021

Publication year: 2021

Pages: 312-317

Language: English

ISBN-13: 9781713835592

Document type: Conference article (CA)

Conference name: 14th Textile Bioengineering and Informatics Symposium, TBIS 2021

Conference date: July 6, 2021 - July 9, 2021

Conference location: Virtual, Online

Conference code: 172690

Publisher: Textile Bioengineering and Informatics Society (TBIS)

Abstract: Nowadays, people are increasingly seeking out personalized clothing, breaking the past pattern where designer offers a design and customers passively accept it. Customers are demanding to be more involved in the design process and to express themselves in their everyday wear. This paper summarizes and analyzes the common styles and shapes of pant denim, explores the changes of various components and the applicable occasions of each element based on modularization, and eventually simulates an interactive design platform for pant denim using interactive genetic algorithm. © 2019 Textile Bioengineering and Informatics Symposium Proceedings 2021 - 14th Textile Bioengineering and Informatics Symposium, TBIS 2021. All rights reserved.

Number of references: 14

Main heading: Genetic algorithms

Controlled terms: Design - Modular construction - Textiles

Uncontrolled terms: Breakings - Design platform - Design-process - Element-based - Interactive design - Interactive genetic algorithm - Modularizations - Pant denim - Personalized clothings

Classification code: 405.2 Construction Methods - 819 Synthetic and Natural Fibers; Textile Technology

Funding text: The authors disclosed receipt of the following financial support for research, authorship, and/or publication of this article: This research project is funded by Young and Middle-aged Teacher Educational Research Project of Fujian Province. The project number is JAT190529.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

60. Refractive index and temperature sensor based on fiber ring laser with tapered seven core fiber structure in 2 μ m band (Open Access)

Accession number: 20205009613238

Authors: Wang, Ying (1, 2); Chen, Zhihao (1); Chen, Weijuan (1, 2); Zhang, Xianzeng (2)

Author affiliation: (1) Research Center for Photonics Technology, Quanzhou Normal University, China; (2) College of Photonic and Electronic Engineering, Fujian Normal University, China

Corresponding author: Chen, Zhihao(zhihaochen@qztc.edu.cn)

Source title: Optical Fiber Technology

Abbreviated source title: Opt. Fiber Technol.

Volume: 61

Issue date: January 2021

Publication year: 2021

Article number: 102388

Language: English

ISSN: 10685200

CODEN: OFTEFV

Document type: Journal article (JA)

Publisher: Academic Press Inc.

Abstract: A weakly-coupled taper-based seven core fiber (TSCF) structure sensor for refractive index (RI) and temperature measurement with a fiber ring cavity laser in 2 μ m band was proposed and demonstrated. The TSCF fiber structure acts as both the sensing head and the filter of the laser. Compared with the conventional broadband sensing system, the laser sensing system we proposed has a higher optical signal to noise ratio (OSNR) of ~40 dB and a narrower 3 dB bandwidth of ~0.05 nm. By exposing the TSCF segment to the increasing RI solutions, the output wavelength will have a redshift. A sensitivity of 549.599 nm/RIU was obtained with the RI of NaCl solution changing from 1.3325 to 1.3793. While for temperature measurement, a sensitivity of -4 pm/°C was achieved with the temperature ranging from 35 °C to 70 °C. Notably, the sensing system we proposed shows the merits of narrow 3 dB bandwidth, easy construction, high resolution, high signal-to-noise ratio, and easier to monitor. © 2020 Elsevier Inc.

Number of references: 34

Main heading: Refractive index

Controlled terms: Bandwidth - Fibers - Ring lasers - Signal to noise ratio - Sodium chloride - Temperature measurement

Uncontrolled terms: Fiber ring cavity - Fiber structures - Fiber-ring lasers - High resolution - High signal-to-noise ratio - Optical signal to noise ratio - Output wavelengths - Sensing systems

Classification code: 716.1 Information Theory and Signal Processing - 741.1 Light/Optics - 744 Lasers - 944.6 Temperature Measurements

Numerical data indexing: Decibel 3.00e+00dB, Size 2.00e-06m, Temperature 3.08e+02K to 3.43e+02K

DOI: 10.1016/j.yofte.2020.102388

Funding Details:

Funding text: This work was supported by the fund of Tongjiang Scholar Distinguished Professor, the fund of "Harbour Project" of Quanzhou under Grant 2017ZT013. It is also supported by Fujian Provincial Key Laboratory of Advanced Micro-Nano Photonics Technology and Devices.

Compendex references: YES

Open Access type(s): All Open Access, Bronze

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

61. Inter-ligand charge-transfer interactions in a photochromic and redox active zinc-organic framework

Accession number: 20213810906994

Authors: Zhou, Yan (1, 2); Han, Lei (1); W.-J., Chen

Author affiliation: (1) Faculty of Materials Science & Chemical Engineering, Ningbo University, Zhejiang, Ningbo; 315211, China; (2) School of Chemistry and Chemical Engineering, Guangxi University for Nationalities, 188 Daxue East Road, Nanning; Guangxi; 530006, China; (3) Department of Material Chemistry, College of Chemical Engineering and Material, Quanzhou Normal University, Fujian, Quanzhou; 362000, China

Corresponding author: Zhou, Yan(zhouyan8212@hotmail.com)

Source title: CrystEngComm

Abbreviated source title: Crystengcomm

Volume: 23

Issue: 35

Issue date: September 21, 2021

Publication year: 2021

Pages: 5982-5988

Language: English

E-ISSN: 14668033

CODEN: CRECF4

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: Understanding the charge-transfer mechanism in metal-organic frameworks is of great importance to design photoactive, electroactive and conductive materials. A novel Zn(ii)-organic framework shows a 1D stair-like structure with strong π - π stacking interactions between the mixed linkers. What's more, it displays reversible photochromic properties and its thin film exhibits electroactive properties due to the redox active behavior of NDI core parts and the electron or charge transfer within the linkers. Also, TD-DFT computational calculations show that inter-ligand charge-transfer interactions exist in this novel photochromic and redox active MOF. © The Royal Society of Chemistry 2021.

Number of references: 33

Main heading: Charge transfer

Controlled terms: Conductive materials - Design for testability - Ligands - Metal-Organic Frameworks - Organometallics - Photochromism - Redox reactions - Zinc compounds

Uncontrolled terms: Charge transfer interaction - Charge transfer mechanisms - Computational calculations - Electro actives - Electroactive properties - Photochromic properties - Pi-stacking - Redox-active

Classification code: 708.2 Conducting Materials - 741.1 Light/Optics - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds

DOI: 10.1039/d1ce00689d

Funding text: This work was supported by the Natural Science Foundation of Zhejiang Province (LY21B010004), the Specific Research Project of Guangxi for Research Bases and Talents (AD20238048), the Scientific Research Foundation of Guangxi University for Nationalities (2019KJQD12), and the Scientific Research Project of Guangxi Education Department (2020KY04025).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

62. A wide-field microscope utilizing two cellphones for health-care applications

Accession number: 20214811234300

Authors: Yu, Zhenfang (1, 2); Li, Yunfei (1, 2); Geng, Dongxian (1, 2); Wu, Pinghui (3)

Author affiliation: (1) Analysis and Test Center of Sichuan Province, Chengdu, China; (2) Scientific Equipments Company of Sichuan Province, Chengdu, China; (3) College of Physics & Information Engineering, Quanzhou Normal University, Quanzhou, China

Corresponding author: Wu, Pinghui(phwu@zju.edu.cn)

Source title: Journal of Biophotonics

Abbreviated source title: J. Biophotonics

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 1864063X**E-ISSN:** 18640648**Document type:** Article in Press**Publisher:** John Wiley and Sons Inc

Abstract: In this report, we report a wide field-of-view (FOV) bright field (BF) microscope with compact and portable optical components, mechanically attached to the existing camera unit of the cellphone. A white screen displayed on a cellphone as the illumination source to pump the sample of interest uniformly for the purpose of the reduction in assembly complexity and alignment. It offers a large FOV of 4.36×3.27 mm without digital zoom and a spatial resolution of $1.5 \mu\text{m}$. Furthermore, we also have demonstrated the potential application for diseases diagnosis and screening by imaging malaria-infected blood sample and iron deficiency anemia blood sample in resource-constrained settings where mobile phone infrastructure is already ubiquitous but microscope is notoriously scarce. © 2021 Wiley-VCH GmbH

Number of references: 18**Main heading:** Diseases**Controlled terms:** Blood - Cellular telephones - Diagnosis - mHealth - Microscopes**Uncontrolled terms:** % reductions - Blood samples - Bright-fields - Cell phone - Digital zooms - Illumination sources - Large field of views - Optical components - Wide field-of-view - Wide-field**Classification code:** 461.2 Biological Materials and Tissue Engineering - 461.6 Medicine and Pharmacology - 461.7 Health Care - 718.1 Telephone Systems and Equipment - 741.3 Optical Devices and Systems**Numerical data indexing:** Size $1.50\text{E-}06\text{m}$, Size $3.27\text{E-}03\text{m}$ **DOI:** 10.1002/jbio.202100200**Compendex references:** YES**Database:** Compendex**Data Provider:** Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

63. Non-Invasive Measurement of Vital Signs Based on Seven-Core Fiber Interferometer

Accession number: 20210910015737**Authors:** Chen, Weijuan (1, 5); Zhang, Yi (2); Yang, Huicheng (1); Qiu, Yishen (3); Li, Hui (3); Chen, Zhihao (1); Yu, Changyuan (4)

Author affiliation: (1) Fujian Provincial Key Laboratory of Advanced Micro-Nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou, China; (2) School of Informatics, Xiamen University, Xiamen, China; (3) College of Photonic and Electronic Engineering, Fujian Normal University, Fuzhou, China; (4) Department of Electronic and Information Engineering, Photonics Research Center, The Hong Kong Polytechnic University, Hong Kong; (5) College of Electronics and Information Science, Fujian Jiangxia University, Fuzhou; 350108, China

Corresponding author: Chen, Zhihao(zhihaochen@qztc.edu.cn)**Source title:** IEEE Sensors Journal**Abbreviated source title:** IEEE Sensors J.**Volume:** 21**Issue:** 9**Issue date:** May 1, 2021**Publication year:** 2021**Pages:** 10703-10710**Article number:** 9360785**Language:** English**ISSN:** 1530437X**E-ISSN:** 15581748**Document type:** Journal article (JA)**Publisher:** Institute of Electrical and Electronics Engineers Inc.

Abstract: Electrical-based vital signs monitoring, especially the electrocardiogram (ECG) technique, has been investigated and applied in daily life. But this technique meets the limitations, e.g., the direct skin-contact, body hair shaving, the discomfort and inconvenience of the test subject. Recently, optical-based vital signs monitoring has been demonstrated to be a promising technique for realizing non-invasive monitoring. However, some of them exhibit the disadvantages of high cost and lacking compactness. We propose and demonstrate a non-invasive and continuous ballistocardiogram (BCG) based vital signs monitoring system, using a seven-core fiber interferometer (SCFI) sensor, which provided a more convenient, more compact, and less costly way to measure the vital signs. The results show that the measured HR and RR of the proposed sensor agree well with the commercial physiologic device. We recommend that the proposed sensor is promising for long-term and noninvasive measuring vital signs. © 2021 IEEE.

Number of references: 28

Main heading: Patient monitoring

Controlled terms: Electrocardiography - Interferometers

Uncontrolled terms: Daily lives - Fiber interferometers - High costs - Non- invasive measurements - Non-invasive monitoring - Skin contact - Vital sign - Vital signs monitoring

Classification code: 461.6 Medicine and Pharmacology - 941.3 Optical Instruments

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Funding Details:

Funding text: Manuscript received February 10, 2021; accepted February 11, 2021. Date of publication February 23, 2021; date of current version April 5, 2021. This work was supported in part by the fund of Tongjiang Scholar Distinguished Professor, in part by the fund of "Harbour Project" of Quanzhou under Grant 2017ZT013, and in part by the Fujian Provincial Key Laboratory of Advanced Micro-Nano Photonics Technology and Devices. The associate editor coordinating the review of this article and approving it for publication was Prof. Carlos Marques. (Corresponding author: Zhihao Chen.) Weijuan Chen is with the Fujian Provincial Key Laboratory of Advanced Micro-Nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou 362000, China, and also with the College of Electronics and Information Science, Fujian Jiangxia University, Fuzhou 350108, China (e-mail: weijuanchen@outlook.com).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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64. The effects of various molecular weight of passivator on the photoluminescence properties of graphene quantum dots

Accession number: 20204309404646

Authors: Zhu, Xingqun (1, 2); Li, Zhan (2); Hu, Guojing (2); Li, Jing (1, 2); Xiang, Bin (1, 2)

Author affiliation: (1) Photonic Technology Research and Development Center, Quanzhou Normal University, No 398, Donghai Main Street, Quanzhou; Fujian; 362000, China; (2) Department of Materials Science and Engineering, CAS Key Lab of Materials for Energy Conversion, University of Science and Technology of China, Hefei; Anhui; 230026, China

Corresponding author: Xiang, Bin(binxiang@ustc.edu.cn)

Source title: Materials Chemistry and Physics

Abbreviated source title: Mater Chem Phys

Volume: 258

Issue date: January 15, 2021

Publication year: 2021

Article number: 123922

Language: English

ISSN: 02540584

CODEN: MCHPDR

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Here, we realize manipulation of photoluminescence (PL) intensity of GQDs through various molecular weight of surface passivator. With the increase of passivator molecular weight, only the PL intensity increases. However, the peak positions and half-peak width of spectral line remain unchanged. Our results reveal that surface passivation with larger molecular weight only weakens the chemical activity of graphene quantum dots (GQDs) and the π - π stacking interaction between GQDs, but exerts less impact on GQDs intrinsic energy gap. Therefore, the weaker π - π stacking interaction and chemical activity induce the weaker non-radiative recombination, leading to enhanced fluorescence from radiative recombination. © 2020 Elsevier B.V.

Number of references: 32

Main heading: Semiconductor quantum dots

Controlled terms: Graphene - Graphene quantum dots - Molecular weight - Nanocrystals - Passivation - Photoluminescence

Uncontrolled terms: Chemical activities - Enhanced fluorescence - Intrinsic energy - Non-radiative recombinations - Photoluminescence intensities - Photoluminescence properties - Radiative recombination - Surface passivation

Classification code: 539.2.1 Protection Methods - 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 761 Nanotechnology - 804 Chemical Products Generally - 931.3 Atomic and Molecular Physics

DOI: 10.1016/j.matchemphys.2020.123922

Funding Details: Number: -, Acronym: -, Sponsor: Guangdong Provincial Development and Reform Commission;

Funding text: This work was supported by Fujian provincial development and reform commission investment [2017] No 436 .

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

65. Understanding the effect of website logos as animated spokescharacters on the advertising: A lens of parasocial interaction relationship

Accession number: 20211410159573

Authors: Zhou, Fei (1); Su, Qiulai (2); Mou, Jian (3)

Author affiliation: (1) College of Business Administration, Huaqiao University, China; (2) Quanzhou Normal University, China; (3) School of Business, Pusan National University, Korea, Republic of

Corresponding author: Mou, Jian(jian.mou@pusan.ac.kr)

Source title: Technology in Society

Abbreviated source title: Technol. Soc.

Volume: 65

Issue date: May 2021

Publication year: 2021

Article number: 101571

Language: English

ISSN: 0160791X

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: In light of the disadvantages of celebrity spokespersons and the prevalence of brand anthropomorphism, the branding strategy of having an animated spokescharacter (ASC) is gaining popularity. Based on social information processing theory and parasocial interaction relationship (PSR) theory, this study explored the characteristics of brand animated spoke scharacters regarding whether and how they generate advertising effects. In an empirical study involving 292 participants concerning two animated spokescharacters ("Tuniu" and "Three Squirrels"), we obtained the following findings: (1) The characteristics of ASCs (likeability, expertise, and congruence) are positively related to parasocial interaction relationships (PSRs) and advertisement effects; (2) PSRs fully mediate the relationship among likeability and ASC congruence and advertisement effects but partially mediate between ASC expertise and advertisement effects; and (3) adult playfulness moderates the effect of ASC likeability on advertisement effectiveness. This research expands the study of the effects of ASCs on advertising and enriches our understanding of the positive associations of ASCs. © 2021 Elsevier Ltd

Number of references: 104

Main heading: Marketing

Controlled terms: Education

Uncontrolled terms: Advertising effects - Branding strategies - Empirical studies - Interaction relationship - Likeability - Social information processing theory

Classification code: 911.4 Marketing

DOI: 10.1016/j.techsoc.2021.101571

Funding text: This research is supported by the Chinese Social Science Foundation [grant number 19BGL261].

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

66. Generation of rotating optical focal field employing turnstile antenna

Accession number: 20212610574880

Authors: Yu, Yanzhong (1); Huang, Han (1); Lin, Shunda (1); Zeng, Yongxi (1); Zhan, Qiwen (2)

Author affiliation: (1) College of Physics & Information Engineering, Quanzhou Normal University, Fujian; 362000, China; (2) School of Optical-Electrical and Computer Engineering, University of Shanghai for Science and Technology, Shanghai; 200093, China

Corresponding author: Yu, Yanzhong(yuyanzhong059368@163.com)

Source title: Optics Communications

Abbreviated source title: Opt Commun

Volume: 498

Issue date: November 1, 2021

Publication year: 2021

Article number: 127205

Language: English

ISSN: 00304018

CODEN: OPCOB8

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: We report a rotating optical focal field generated by inversely focusing the radiation pattern from a turnstile antenna under a 4Pi focusing system. The turnstile antenna, composed of two mutually perpendicular short dipoles with a quadrature phase offset, is employed to find the required illumination at the pupil plane for creating the rotating field by using a time-reversal holographic methodology. Numerical results demonstrate that the intensity distribution of the created optical focal field exhibits an "8" shape on the focal plane and rotates with radian frequency ω around the optical axis. The angles for the left- and right-hand rotating focal fields are calculated to be $-\pi/2$ and $\pi/2$, respectively. When ω is large enough, the rotating optical focal field with an "8" shape tends to the steady-state perfectly circular spot with nearly pure circular polarization. This rotating optical focal field may suit a variety of potential applications, such as particle revolving, particle acceleration, and near-field scanning optical microscopy. © 2021

Number of references: 24

Main heading: Focusing

Controlled terms: Directional patterns (antenna) - Scanning antennas

Uncontrolled terms: 4pi focusing system - Focal fields - Focusing system - Optical- - Phase offsets - Pupil planes - Quadrature phase - Rotating fields - Rotating optical focal field - Turnstile antennas

DOI: 10.1016/j.optcom.2021.127205

Funding Details: Number: 2019J01736, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: 2020J01777, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: 61571271, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: National Natural Science Foundation of China (No. 61571271), Natural Science Foundation of Fujian Province of China (No. 2020J01777, 2019J01736). We declare that we have no financial and personal relationships with other people or organizations that can inappropriately influence our work; there is no professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

67. Study on the model of semi-open-end twist in compact spinning with lattice apron

Accession number: 20203309035587

Authors: Fu, Ting (1); Zhang, Yuze (1); Akankwasa, Nicholas Tayari (1); Chen, Nanliang (1); Lin, Huiting (2)

Author affiliation: (1) College of Textiles, Donghua University, Shanghai, China; (2) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou, China

Corresponding author: Lin, Huiting(linht1218@126.com)

Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Volume: 91

Issue: 5-6

Issue date: March 2021

Publication year: 2021

Pages: 467-479

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Journal article (JA)

Publisher: SAGE Publications Ltd

Abstract: The twist mechanism of the fiber strand in the condensing zone in compact spinning is complex. This paper proposes a dynamic model to evaluate the additional twist of the fiber strands. Based on the flow simulation in the condensing zone, the fiber trajectory in the suction slot was simulated and obtained. Several spinning parameters such as suction slot angle, suction slot width, negative pressure, and shape of suction slot, were varied to show their effects on the additional twist. The simulation results indicated that by increasing the suction slot angle from 5° to 10° the additional twist increased significantly. Higher negative pressure also leads to an increase in the additional twist. The suction slot width has a greater effect on the fiber trajectory than on the additional twist. An arc-shape suction slot

increased the additional twist compared with a linear-shape one. An experimental test conducted revealed a precise agreement with the simulation results. © The Author(s) 2020.

Number of references: 16

Main heading: Spinning (fibers)

Controlled terms: Fibers

Uncontrolled terms: Arc shape - Compact spinnings - Experimental test - Lattice aprons - Negative pressures - Spinning parameters - Suction slot

Classification code: 819.3 Fiber Chemistry and Processing

DOI: 10.1177/0040517520942545

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

68. Generating an optical needle with prescribed length and polarization direction through reversing the radiation pattern from a spatial ULS antenna

Accession number: 20214010988076

Authors: Zeng, Yongxi (1); Chen, Musheng (1); Huang, Han (1); Wu, Pinghui (1); Zhou, Mianmian (1); Yu, Yanzhong (1)

Author affiliation: (1) College of Physics Information Engineering, Quanzhou Normal University, Fujian, China

Corresponding author: Yu, Yanzhong(yuyanzhong059368@163.com)

Source title: Journal of Modern Optics

Abbreviated source title: J. Mod. Opt.

Volume: 68

Issue: 21

Issue date: 2021

Publication year: 2021

Pages: 1202-1210

Language: English

ISSN: 09500340

E-ISSN: 13623044

CODEN: JMOPEW

Document type: Journal article (JA)

Publisher: Taylor and Francis Ltd.

Abstract: Unlike the conventional optical needle directed along the optical axis, we propose an approach to generate an optical needle with prescribed polarization direction and length by inversely focusing the radiation pattern from a spatial uniform line source (ULS) antenna in a 4Pi focusing system. The spatial ULS antenna situated at the foci of the 4Pi configuration is employed to obtain the required illumination at the pupil plane for creating the above optical needle through the use of a time-reversal holographic methodology. Numerical results show that the spatial polarization direction of the created optical needle is consistent with that of the spatial ULS antenna, that its length is approximately equal to the length of the ULS antenna, and that the transverse size of the optical needle is (Formula presented.) over its extent. The proposed method is more flexible than traditional methods for customizing the optical needle with prescribed characteristics. © 2021 Informa UK Limited, trading as Taylor & Francis Group.

Number of references: 35

Main heading: Needles

Controlled terms: Antennas - Directional patterns (antenna) - Focusing - Polarization

Uncontrolled terms: 4pi focusing system - Focusing system - Line sources - Optical axis - Optical needle - Optical- - Polarization direction - Pupil planes - Spatial uniform line source antenna - Time-reversal

DOI: 10.1080/09500340.2021.1983658

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

69. High-Performance AlGaIn-Based Solar-Blind UV Photodetectors for Sensing Applications

Accession number: 20213110707959

Authors: Chen, Yiping (1); Zheng, Chaohong (1); Chen, Yiren (2)

Author affiliation: (1) College of Resource and Environment, Quanzhou Normal University, Quanzhou; 362000, China; (2) State Key Laboratory of Luminescence and Applications, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun; 130033, China

Corresponding author: Chen, Yiren(chenyr@ciomp.ac.cn)

Source title: Physica Status Solidi (A) Applications and Materials Science

Abbreviated source title: Phys. Status Solidi A Appl. Mater. Sci.

Volume: 218

Issue: 18

Issue date: September 2021

Publication year: 2021

Article number: 2100207

Language: English

ISSN: 18626300

E-ISSN: 18626319

CODEN: PSSABA

Document type: Journal article (JA)

Publisher: John Wiley and Sons Inc

Abstract: The full solid-state, intrinsic cutoff solar-blind UV photodetectors are widely used in the military and civilian fields. Herein, to achieve real-time solar-blind UV signal detection for application in portable equipment, the material epitaxy, device fabrication, and performance characterization of high-performance back-illuminated AlGaIn-based solar-blind UV photodetectors are conducted at first. Based on the photodetector, a discrete signal amplifier circuit is subsequently designed and prepared to fulfill the weak solar-blind signal detection. Through assembling the amplifier circuit with the AlGaIn-based solar-blind UV photodetector, it can output real-time voltage signal with different amplitude according to the intensity of the incident UV light signal. This study is of great significance for developing a portable solar-blind UV detection system. © 2021 Wiley-VCH GmbH

Number of references: 22

Main heading: Gallium alloys

Controlled terms: Aluminum alloys - Aluminum gallium nitride - III-V semiconductors - Light amplifiers - Photodetectors - Photons - Signal detection

Uncontrolled terms: Amplifier circuits - Back-illuminated - Device fabrications - Discrete signal - Performance characterization - Sensing applications - UV photodetectors - Voltage signals

Classification code: 541.2 Aluminum Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 716.1 Information Theory and Signal Processing - 804.2 Inorganic Compounds - 931.3 Atomic and Molecular Physics

DOI: 10.1002/pssa.202100207

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

70. Research on Technical Innovation of Emergency Supply Chain Management Based on Blockchain Technology

Accession number: 20214711211784

Authors: Fu, Linglan (1); Su, J.L. (2)

Author affiliation: (1) Quanzhou Institute of Information Engineering, Fujian Open University Quanzhou Branch, Quanzhou, China; (2) TSL School of Business, Quanzhou Normal University, Quanzhou, China

Corresponding author: Su, J.L.(su_jinlong@hotmail.com)

Source title: 2021 International Conference on Electronic Information Engineering and Computer Science, EIECS 2021

Abbreviated source title: Int. Conf. Electron. Inf. Eng. Comput. Sci., EIECS

Part number: 1 of 1

Issue title: 2021 International Conference on Electronic Information Engineering and Computer Science, EIECS 2021

Issue date: September 23, 2021

Publication year: 2021

Pages: 567-571

Language: English

ISBN-13: 9781665416740

Document type: Conference article (CA)

Conference name: 2021 International Conference on Electronic Information Engineering and Computer Science, EIECS 2021

Conference date: September 23, 2021 - September 25, 2021

Conference location: Changchun, China

Conference code: 173762

Sponsor: IEEE

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: This paper analyzes the emergency in China's Fujian province in response to the outbreak of the main problems in the supply chain operation and difficulties, through the investigation of both for many times, discusses how to on the basis of the existing cloud computing platform, using block chain technology, raise the emergency of the Fujian province and even the whole of China supply chain management efficiency of the technical solution. This paper focuses on research on technology innovation of emergency supply chain management based on blockchain Technology. After thorough investigation and analysis, the research group put forward several feasible schemes. © 2021 IEEE.

Number of references: 9

Main heading: Supply chain management

Controlled terms: Blockchain

Uncontrolled terms: Block-chain - Blockchain technology - Cloud computing platforms - Emergency resource supply chain - Emergency resources - Fujian Province - Management innovation - Paper analysis - Supply chain operation - Technical innovation

Classification code: 723.3 Database Systems - 911.3 Inventory Control - 912 Industrial Engineering and Management - 913 Production Planning and Control; Manufacturing

DOI: 10.1109/EIECS53707.2021.9588108

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

71. Au nanoparticle-loaded eggshell for electrochemical detection of nitrite (Open Access)

Accession number: 20210509851277

Authors: Ding, Qi (1, 2); Cao, Liping (2); Liu, Minghuan (1); Lin, Hetong (2); Yang, Da-Peng (1, 2)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou Fujian; 362000, China; (2) College of Food Science, Fujian Agriculture and Forestry University, Fuzhou Fujian; 350002, China

Corresponding author: Liu, Minghuan(minghuansdjh@126.com)

Source title: RSC Advances

Abbreviated source title: RSC Adv.

Volume: 11

Issue: 7

Issue date: January 20, 2021

Publication year: 2021

Pages: 4112-4117

Language: English

E-ISSN: 20462069

CODEN: RSCACL

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: Eggshell is an extremely large source of domestic waste and has a huge scientific research potential because of its unique porous hierarchical structure. By converting eggshell waste into valuable functional materials, it can be recycled in many fields. Herein, we envisioned an economical and environmentally friendly conversion method for synthesizing Au nanoparticle loaded eggshell nanocomposites (defined as Au/CaCO₃ nanocomposites) for the detection of trace amounts of nitrite in oolong tea. Compared with bare electrodes, the prepared Au/CaCO₃ nanocomposite-based electrodes have obvious electrochemical enhancement behavior. A wide linear response range of 0.01 to 1.00 mM and a relatively low detection limit of 11.55 nM have been obtained in this study. The "turning waste into treasure" transformation strategy not only provides a practical and low-cost method for comprehensive utilization of eggshells as valuable functional materials, but also provides a new approach for sensitive detection of pollutants. © The Royal Society of Chemistry.

Number of references: 45

Main heading: Gold nanoparticles

Controlled terms: Chemical detection - Electrochemical electrodes - Functional materials - Nanocomposites - Nanoparticles - Synthesis (chemical) - Tea

Uncontrolled terms: Comprehensive utilizations - Conversion methods - Electrochemical detection - Hierarchical structures - Linear response range - Low detection limit - Scientific researches - Sensitive detection

Classification code: 761 Nanotechnology - 801 Chemistry - 802.2 Chemical Reactions - 933 Solid State Physics - 951 Materials Science

DOI: 10.1039/d0ra09892b

Funding Details: Number: JAT160402, Acronym: -, Sponsor: Department of Education, Fujian Province; Number: 2019H0023, 2020J01774, Acronym: -, Sponsor: Fujian Provincial Department of Science and Technology;

Funding text: We sincerely thank the Fujian Provincial Department of Education (project number: JAT160402) and Fujian Provincial Department of Science and Technology (project number: 2020J01774, 2019H0023) for the support to this project.

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

72. Typical Characteristic-Based Type-2 Fuzzy C-Means Algorithm

Accession number: 20212010351669

Authors: Yang, Xiyang (1); Yu, Fusheng (2); Pedrycz, Witold (3)

Author affiliation: (1) Key Laboratory of Intelligent Computing and Information Processing of Fujian Province, Quanzhou Normal University, Quanzhou, China; (2) School of Mathematical Sciences, Beijing Normal University, Beijing, China; (3) Department of Electrical and Computer Engineering, University of Alberta, Edmonton; AB, Canada

Corresponding author: Yu, Fusheng(yufusheng@bnu.edu.cn)

Source title: IEEE Transactions on Fuzzy Systems

Abbreviated source title: IEEE Trans Fuzzy Syst

Volume: 29

Issue: 5

Issue date: May 2021

Publication year: 2021

Pages: 1173-1187

Article number: 8972398

Language: English

ISSN: 10636706

E-ISSN: 19410034

CODEN: IEFSEV

Document type: Journal article (JA)

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: Type-2 fuzzy sets provide an efficient vehicle for handling uncertainties of real-world problems, including noisy observations. Bringing type-2 fuzzy sets to clustering algorithms offers more flexibility to handle uncertainties associated with membership concepts caused by a noisy environment. However, the existing type-2 fuzzy clustering algorithms suffer from a time-consuming type-reduction process, which not only hampers the clustering performance but also increases the burden of understanding the clustering results. In order to alleviate the problem, this article introduces a set of typical characteristics of type-2 fuzzy sets and establishes a characteristic-based type-2 fuzzy clustering algorithm. Being different from the objective function used in the fuzzy C-means (FCM) algorithm that produces cluster centers and type-1 memberships, the objective function in the proposed algorithm contains additional characteristics of type-2 membership grades, namely, centers of gravity and cardinalities of the secondary fuzzy sets. The derived iterative formulas used for these parameters are much more efficient than the interval type-2 FCM algorithm. The experiments carried out in this study show that the proposed typical characteristic-based type-2 FCM algorithm has an ability of detecting noise as well as assigning suitable membership degrees to the individual data. © 1993-2012 IEEE.

Number of references: 53

Main heading: Clustering algorithms

Controlled terms: Copying - Fuzzy clustering - Fuzzy sets - Iterative methods

Uncontrolled terms: Clustering results - Fuzzy C-means algorithms - Iterative formulas - Membership degrees - Noisy environment - Noisy observations - Objective functions - Real-world problem

Classification code: 723 Computer Software, Data Handling and Applications - 745.2 Reproduction, Copying - 903.1 Information Sources and Analysis - 921.6 Numerical Methods

DOI: 10.1109/TFUZZ.2020.2969907

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

73. Building trend fuzzy granulation based LSTM recurrent neural network for long-term time series forecasting

Accession number: 20211110073107

Authors: Tang, Yuqing (1); Yu, Fusheng (2); Pedrycz, Witold (3); Yang, Xiyang (4); Wang, Jiayin (5); Liu, Shihu (6)

Author affiliation: (1) School of Mathematical Science, Beijing Normal University, Beijing, 100875, China, Beijing, China, (e-mail: yuqingt689@163.com); (2) School of Mathematical Sciences, Beijing Normal University, 47836 Beijing, Beijing, China, 100875 (e-mail: yufusheng@bnu.edu.cn); (3) Electrical and Computer Engineering Department, University of Alberta, Edmonton, Alberta, Canada, T6G 2G6 (e-mail: wpedrycz@ualberta.ca); (4) School of Mathematics and Computer Science, Quanzhou Normal University, 117823 Quanzhou, Fujian, China, 362000 (e-mail: yangxiyang@139.com); (5) School of Mathematical Science, Beijing Normal University, Beijing 100875, China, Beijing, China, (e-mail: wjy@bnu.edu.cn); (6) School of Mathematics and Computer Sciences, Yunnan Minzu University, Kunming, 650500, Kunming, Yunnan, China, (e-mail: liush02@126.com)

Source title: IEEE Transactions on Fuzzy Systems

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Issue date: 2021

Publication year: 2021

Language: English

ISSN: 10636706

E-ISSN: 19410034

CODEN: IEFSEV

Document type: Article in Press

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: The existing long-term time series forecasting methods based on neural networks suffer from multiple limitations such as accumulated errors and diminishing temporal correlation, which compromise the prediction quality. To overcome these shortcomings, this paper builds trend fuzzy granulation based long short-term memory (LSTM) neural networks to carry out long-term forecasting, where data points with consistent trend characteristics including trend change, fluctuation range and trend persistence are predicted in unison rather than individually. Noticing that these trend characteristics are more urgently needed than just magnitude information, a question on how to granulate a time series into a granular time series consists of meaningful granules containing trend information comes to be a crucial step. Only if the established granules fit the varying patterns of time series at utmost can such granulation make sense for the improvement of the forecasting accuracy, thus an optimization method of trend-oriented fuzzy granulation is proposed to meliorate the granulation results. With the built trend fuzzy granulation based LSTM networks, the successive iterations of one-step forecasting are prevented, and the prediction errors of data within a granule will not further increase. This is the first attempt to build trend fuzzy granule based LSTM to predict trend characteristics. Experiments completed on publicly available time series show good performance of the proposed model. IEEE

Main heading: Long short-term memory

Controlled terms: Forecasting - Fuzzy inference - Granulation - Information granules - Time series

Uncontrolled terms: Forecasting accuracy - Granular time series - Long-term forecasting - Magnitude information - Optimization method - Successive iteration - Temporal correlations - Time series forecasting

Classification code: 723.2 Data Processing and Image Processing - 723.4.1 Expert Systems - 802.3 Chemical Operations - 922.2 Mathematical Statistics

DOI: 10.1109/TFUZZ.2021.3062723

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

74. Hierarchical Ni₃S₄@MoS₂ nanocomposites as efficient electrocatalysts for hydrogen evolution reaction

Accession number: 20212310470976

Authors: Ren, Yuxi (1, 2); Zhu, Shengli (2, 3, 4, 5); Liang, Yanqin (2, 3); Li, Zhaoyang (2, 3); Wu, Shuilin (2, 3); Chang, Chuntao (1); Luo, Shuiyuan (5); Cui, Zhenduo (2)

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Laboratory of Composite and Functional Materials, Tianjin; 300350, China; (4) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (5) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Chang, Chuntao(changct@dgut.edu.cn); Zhu, Shengli(slzhu@tju.edu.cn)

Source title: Journal of Materials Science and Technology

Abbreviated source title: J. Mater. Sci. Technol.

Volume: 95

Issue date: December 30, 2021

Publication year: 2021

Pages: 70-77

Language: English

ISSN: 10050302

CODEN: JSCTEQ

Document type: Journal article (JA)

Publisher: Chinese Society of Metals

Abstract: Hydrogen evolution reaction (HER) through water splitting is a promising way to solve the energy shortage. Noble-metal-free HER electrocatalysts with high efficiency is very important for practical applications. Herein, we prepare the Ni₃S₄@MoS₂ electrocatalyst on carbon cloth (CC) through a two-step hydrothermal process. The Ni₃S₄ nanorods are uniformly integrated with the MoS₂ nanosheets, forming a hierarchical structure and heterogeneous interfaces. The fast electron transfer on the interface enhances the kinetics of catalytic reaction. The hierarchical structure provides more exposed active sites. The Ni₃S₄@MoS₂/CC exhibits good catalytic activity and long-term stability for HER. This work provided a practicable strategy to develop efficient electrocatalysts for HER in alkaline media. © 2021

Number of references: 60

Main heading: Hydrogen evolution reaction

Controlled terms: Catalysis - Catalyst activity - Electrocatalysts - Electrolysis - Electron transport properties - Layered semiconductors - Molybdenum compounds - Nanorods - Nickel compounds - Precious metals - Reaction kinetics

Uncontrolled terms: Energy shortages - Fast electron transfer - Heterogeneous interfaces - Hierarchical structures - Kinetics of catalytic reactions - Long term stability - Two-step hydrothermal process - Water splitting

Classification code: 547.1 Precious Metals - 761 Nanotechnology - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 933 Solid State Physics

DOI: 10.1016/j.jmst.2021.04.016

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: We gratefully acknowledge support by the National Natural Science Foundation of China (51771131).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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75. A 3D controllable diffraction-limited spot array generated by means of a spaced-dipole array (Open Access)

Accession number: 20213510846638

Authors: Yu, Yanzhong (1); Huang, Han (1); Lin, Shunda (1); Zeng, Yongxi (1); Chen, Musheng (1); Zhan, Qiwen (1, 2)

Author affiliation: (1) College of Physics & Information Engineering, Quanzhou Normal University, Quanzhou, China; (2) School of Optical-Electrical and Computer Engineering, University of Shanghai for Science and Technology, Shanghai, China

Corresponding author: Yu, Yanzhong(yuyanzhong059368@163.com)

Source title: IET Optoelectronics

Abbreviated source title: IET Optoelectron

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 17518768

Document type: Article in Press

Publisher: John Wiley and Sons Inc

Abstract: The creation of an array of three-dimensional (3D) multifocal spots in the focal region has attracted interest due to potential applications in parallel or simultaneous process areas. Based on the theory of pattern synthesis of

antenna array and the electromagnetic time reversal technique, an optimisation-free approach is reported to construct a 3D controllable diffraction-limited spot array in the focal volume of a 4pi focussing system formed by two high-numerical-aperture (NA) objectives. The proposed method can be implemented readily by inversely focussing the field radiated from a virtual spaced-dipole antenna array mounted at the focus of the 4pi configuration. By solving the inverse problem, the required illumination in the pupil plane for producing the 3D spot array can be found. It is demonstrated that the 3D diffraction-limited focal spot array owns the properties of controllable polarisation, scheduled number, tunable location, and adjustable interval. This array may find applications in 3D simultaneous optical manipulation and trapping, 3D parallel fabrication, 3D optical data storage, and so on. © 2021 The Authors. IET Optoelectronics published by John Wiley & Sons Ltd on behalf of The Institution of Engineering and Technology.

Number of references: 33

Main heading: Diffraction

Controlled terms: Antenna arrays - Digital storage - Dipole antennas - Directional patterns (antenna) - Inverse problems - Optical data storage

Uncontrolled terms: 3D diffraction - Diffraction limited - Electromagnetic time reversals - Focal regions - High numerical apertures - Optical manipulation - Pattern synthesis - Threedimensional (3-d)

Classification code: 722.1 Data Storage, Equipment and Techniques

DOI: 10.1049/ote2.12055

Funding Details: Number: 61571271, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;

Number: 2019J01736, 2020J01777, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province;

Funding text: This work is supported by the National Natural Science Foundation of China (Grant No. 61571271), the Natural Science Foundation of Fujian Province of China (No. 2020J01777, and No. 2019J01736).

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

76. Removal of humic acid and Cr() from water using ZnO–30N-zeolite

Accession number: 20211710240842

Authors: Wang, Lingling (1); Dionysiou, Dionysios D. (2); Lin, Jianming (3); Huang, Yuxian (1); Xie, Xiaolan (1)

Author affiliation: (1) College of Chemical Engineering and Materials, Quanzhou Normal University, Quanzhou; 362000, China; (2) Environmental Engineering and Science Program, Department of Chemical and Environmental Engineering, 705 Engineering Research Center, University of Cincinnati, Cincinnati, OH; 45221-0012, United States; (3) Fujian Provincial Key Laboratory of Photoelectric Functional Materials, Huaqiao University, Xiamen; 361021, China

Corresponding author: Wang, Lingling(lasier_wang@hotmail.com)

Source title: Chemosphere

Abbreviated source title: Chemosphere

Volume: 279

Issue date: September 2021

Publication year: 2021

Article number: 130491

Language: English

ISSN: 00456535

E-ISSN: 18791298

CODEN: CMSHAF

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: The mutual influence of humic acid and Cr() on water purification using ZnO–30N-zeolite was investigated in the laboratory. The removal of humic acid by ZnO–30N-zeolite with both pollutants present reached 90% in 5 min. With humic acid alone, more than one day was required to reach the same level of removal. Synergy between humic acid and chromium was thus demonstrated in their removal process by ZnO–30N-zeolite. However, the presence of humic acid showed no obvious effect on the removal capacity of Cr() by ZnO–30N-zeolite. X-ray photoelectron spectra showed that Cr(VI) was reduced to Cr() in the process by both humic acid and ZnO–30N-zeolite. The kinetic mechanism of synergistic removal of humic acid and Cr() by ZnO–30N-zeolite in binary pollutant system was also proposed. © 2021 Elsevier Ltd

Number of references: 21

Main heading: II-VI semiconductors

Controlled terms: Adsorption - Chemicals removal (water treatment) - Chromium - Chromium compounds - Organic acids - Purification - Water pollution - Water treatment plants - Zeolites - Zinc oxide

Uncontrolled terms: Competitive adsorption - Humic acid - Kinetics mechanism - Removal capacity - Removal process - Synergistic adsorptions - Synergistic removal - Water purification - X ray photoelectron spectrum - ZnO

Classification code: 445.1 Water Treatment Techniques - 452.3 Industrial Wastes - 453 Water Pollution - 543.1 Chromium and Alloys - 712.1 Semiconducting Materials - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds

Numerical data indexing: Force 3.00E+01N, Percentage 9.00E+01%, Time 3.00E+02s

DOI: 10.1016/j.chemosphere.2021.130491

Funding Details: Number: 2019C063R, Acronym: -, Sponsor: -; Number: 2020J01772, Acronym: -, Sponsor: -; Number: -, Acronym: UC, Sponsor: University of Cincinnati; Number: -, Acronym: CEAS, Sponsor: College of Engineering and Applied Science, University of Wyoming;

Funding text: This study was supported by the Science Foundation of Quanzhou City (grant number 2019C063R) and the Science and Technology Foundation of Fujian (grant number 2020J01772). D. D. Dionysiou also acknowledges support from the University of Cincinnati through the Herman Schneider Professorship in the College of Engineering and Applied Sciences.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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77. Product modeling design based on genetic algorithm and BP neural network

Accession number: 20211310148776

Authors: Han, Jia-Xuan (1); Ma, Min-Yuan (1); Wang, Kun (1, 2)

Author affiliation: (1) Department of Industrial Design, National Cheng Kung University, Tainan, Taiwan; (2) Institute of Fine Arts and Design, Quanzhou Normal University, Quanzhou, China

Corresponding author: Wang, Kun(P38043027@ncku.edu.tw)

Source title: Neural Computing and Applications

Abbreviated source title: Neural Comput. Appl.

Volume: 33

Issue: 9

Issue date: May 2021

Publication year: 2021

Pages: 4111-4117

Language: English

ISSN: 09410643

E-ISSN: 14333058

Document type: Journal article (JA)

Publisher: Springer Science and Business Media Deutschland GmbH

Abstract: At present, the rapid development of industrial products still lacks reliable theoretical support in terms of styling design. In order to provide a set of effective reference basis for designing a better product appearance plan, this paper takes the shape design of drones as an example. The optimization feature of genetic algorithm optimizes the BP neural network to construct a hybrid GA-BP model, so as to efficiently evaluate and screen out scientific design schemes. By adding 13 of the 16 selected product design schemes to the hybrid GA-BP evaluation system, we perform training to obtain simulated and actual values, and finally, the remaining three design schemes are used for verification. Our results show that the relative errors of the two sets of data verification are 3.4%, 1.9% and 3.1%, respectively. In theory, such accuracy is very high, which basically reflects that the evaluation system of hybrid GA-BP product modeling design enables the design plan to be evaluated quickly, conveniently, effectively and scientifically. © 2021, The Author(s), under exclusive licence to Springer-Verlag London Ltd. part of Springer Nature.

Number of references: 25

Main heading: Product design

Controlled terms: Backpropagation - Genetic algorithms - Neural networks

Uncontrolled terms: BP neural networks - Data verification - Industrial product - Optimization features - Product appearance - Product modeling - Relative errors - Shape designs

Classification code: 723.4 Artificial Intelligence - 913.1 Production Engineering

Numerical data indexing: Percentage 1.90e+00%, Percentage 3.10e+00%, Percentage 3.40e+00%

DOI: 10.1007/s00521-020-05604-0

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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78. In situ formation of a carbon nanotube buckypaper for improving the interlaminar properties of carbon fiber composites (Open Access)

Accession number: 20210609893227

Authors: Wu, Yadong (2, 3); Cheng, Xiuyan (2); Chen, Shaoyun (1); Qu, Bo (1); Wang, Rui (1); Zhuo, Dongxian (1); Wu, Lixin (2)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362200, China; (2) Key Laboratory of Design and Assembly of Functional Nanostructures, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou; Fujian; 350002, China; (3) University of Chinese Academy of Sciences, Beijing; 100049, China

Corresponding author: Wang, Rui(wangrui@fjirsm.ac.cn)

Source title: Materials and Design

Abbreviated source title: Mater. Des.

Volume: 202

Issue date: April 2021

Publication year: 2021

Article number: 109535

Language: English

ISSN: 02641275

E-ISSN: 18734197

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: To improve the interlaminar properties of carbon fiber reinforced polymer composites (CFRPs), a hybrid fiber mat (i-MBP-PCF) was prepared by in situ deposition of a multiwalled carbon nanotube buckypaper (i-MBP) on the surface of functionalized CF fabric (PCF). The effect of the hybrid fiber mat on the interlaminar and electrical properties was systematically investigated. The results showed that the i-MBP-PCF hybrid fiber mat showed excellent interlaminar and electrical property enhancement functions. The interlaminar shear strength (ILSS), Mode-II interlaminar fracture toughness (GIIC), and electrical conductivity in the out-of-plane direction of i-MBP-PCF/EP increased 68.6%, 44.4%, and 6080%, respectively, compared to those of the CF/EP composite. © 2021 The Author(s)

Number of references: 70

Main heading: Multiwalled carbon nanotubes (MWCN)

Controlled terms: Carbon fiber reinforced plastics - Fibers - Fracture toughness - Graphite fibers - Nanotubes - Shear strength

Uncontrolled terms: Carbon fiber composite - Carbon fiber reinforced polymer composite - Electrical conductivity - In-situ formations - Interlaminar properties - Interlaminar shear strength - Mode ii interlaminar fracture toughness - Out-of-plane direction

Classification code: 761 Nanotechnology - 817.1 Polymer Products

Numerical data indexing: Percentage 4.44e+01%, Percentage 6.08e+03%, Percentage 6.86e+01%

DOI: 10.1016/j.matdes.2021.109535

Funding Details: Number: 2019T3013,2019T3016,2019T3018, Acronym: -, Sponsor: -; Number: 2019C018R, Acronym: -, Sponsor: -; Number: 2018CT003,2019Y0042, Acronym: -, Sponsor: Science and Technology Projects of Fujian Province; Number: 2020J01770, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: -, Acronym: -, Sponsor: Program for Jilin University Science and Technology Innovative Research Team;

Funding text: This work was financially supported by the STS Project of Fujian-CAS (Grant No.: 2019T3013 , 2019T3016 and 2019T3018), the Science and Technology of Fujian province (2019Y0042), the " Harbour Program Talent Team Project" of Quanzhou (2018CT003), the Science and Technology plan project of Quanzhou (2019C018R), and the Program for Innovative Research Team in Science and Technology in Fujian Province University (IRTSTFJ) , the Natural Science Foundation of Fujian Province (2020J01770).

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

79. Recent progresses in photocatalytic hydrogen production: design and construction of Ni-based cocatalysts

Accession number: 20203909233873

Authors: Liu, Xiaobin (1); Zhuang, Huaqiang (2)

Author affiliation: (1) College of the Environment & Ecology, Xiamen University, Xiamen, China; (2) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou, China

Corresponding author: Zhuang, Huaqiang(huaqiangz@163.com)

Source title: International Journal of Energy Research

Abbreviated source title: Int. J. Energy Res.

Volume: 45

Issue: 2

Issue date: February 2021

Publication year: 2021

Pages: 1480-1495

Language: English

ISSN: 0363907X

E-ISSN: 1099114X

CODEN: IJERDN

Document type: Journal article (JA)

Publisher: John Wiley and Sons Ltd

Abstract: Up to now, much effort has focused on developing the highly efficiency composite photocatalysts by introducing cocatalysts in the photocatalytic hydrogen production reaction, because the proper cocatalysts can reduce activation energy, provide active sites, and suppress the reverse reaction. The transition metal nickel and its compounds acting as cocatalyst have received intensive attention because of their structural stability, facile preparation, and high performance in hydrogen evolution reaction, and are expected to replace the function of noble metals. This review emphasizes on the latest progresses that design and construction of composite photocatalyst using Ni-based cocatalyst for enhanced hydrogen production, such as metal nickel, nickel sulfide, and nickel phosphide, will be presented. Then, some preparation strategies and influence factors of Ni-based cocatalysts on enhanced photocatalytic hydrogen production are elucidated in detail. Finally, some challenge and perspective on the highly active cocatalysts in the area of photocatalytic hydrogen production from water splitting are also given. © 2020 John Wiley & Sons Ltd

Number of references: 138

Main heading: Hydrogen production

Controlled terms: Activation energy - Energy efficiency - Hydrogen sulfide - Nickel compounds - Stability - Structural metals - Sulfide minerals - Sulfur compounds - Transition metals

Uncontrolled terms: Composite photocatalysts - Design and construction - Enhanced hydrogen productions - Facile preparation - Highly efficiency - Photocatalytic hydrogen production - Reverse reactions - Structural stabilities

Classification code: 482.2 Minerals - 522 Gas Fuels - 525.2 Energy Conservation - 531 Metallurgy and Metallography - 804.2 Inorganic Compounds

DOI: 10.1002/er.5970

Funding Details: Number: 2017Z031, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: This work was supported by Quanzhou Science and Technology Project (2017Z031).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

80. Enhanced Electrocatalysis for Hydrogen Evolution over a Nanoporous NiAlTi/Al₃Ti Hybrid

Accession number: 20213410807737

Authors: Zhu, Shengli (1, 2, 3); Zhou, Yiyang (2); Liang, Yanqin (2); Li, Zhaoyang (2); Wu, Shuilin (2); Cui, Zhenduo (2); Luo, Shuiyuan (1)

Author affiliation: (1) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Fujian, Quanzhou; 362000, China; (2) School of Materials Science and Engineering, Tianjin University, Tianjin; 300350, China; (3) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China

Corresponding authors: Luo, Shuiyuan(15106039659@163.com); Zhu, Shengli(slzhu@tju.edu.cn); Zhou, Yiyang(yyzhou@dicp.ac.cn)

Source title: ACS Applied Energy Materials

Abbreviated source title: ACS Appl. Ener. Mat.

Volume: 4

Issue: 8

Issue date: August 23, 2021

Publication year: 2021

Pages: 7579-7588

Language: English

E-ISSN: 25740962

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: Developing efficient non-precious electrocatalysts for the hydrogen evolution reaction (HER) is a challenge for green and sustainable generation of energy. Herein, we report a self-standing nanoporous (np-) NiAlTi/Al₃Ti hybrid catalyst prepared by a simple dealloying method. By constructing the nanoscale heterostructure, np-NiAlTi/Al₃Ti exhibits outstanding HER performance. In the np-NiAlTi/Al₃Ti hybrid, amorphous NiAlTi serves as the active phase, while the conductive Al₃Ti support affords an effective electron pathway. Meanwhile, the nanoporous electrode possesses abundant active sites and large contact areas for an efficient HER. As a result, the np-NiAlTi/Al₃Ti hybrid delivers a small overpotential of 73 mV at the current density of 10 mA cm⁻², along with good stability in alkaline media. Our work would provide a feasible strategy to explore efficient and low-cost electrocatalysts for energy conversion applications. ©

Number of references: 47

Main heading: Titanium alloys

Controlled terms: Aluminum alloys - Binary alloys - Conversion efficiency - Dealloying - Electrocatalysis - Electrocatalysts - Hydrogen evolution reaction - Ternary alloys

Uncontrolled terms: Alkaline media - Contact areas - Effective electrons - Good stability - Hybrid catalysts - Hydrogen evolution - Nanoporous electrode - Self standings

Classification code: 525.5 Energy Conversion Issues - 541.2 Aluminum Alloys - 542.3 Titanium and Alloys - 801.4.1 Electrochemistry - 803 Chemical Agents and Basic Industrial Chemicals

Numerical data indexing: Current_Density 1.00e+02A/m², Voltage 7.30e-02V

DOI: 10.1021/acsaem.1c00854

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

81. Research on the Applications of Data Mining in the Analysis of Vehicle Insurance Industry

Accession number: 20214010976707

Authors: Xiahou, Jianbing (1); Xiao, Meng (2); He, Xiaojing (2); Cui, Xu (3)

Author affiliation: (1) Quanzhou Normal University, Quzhou, China; (2) Xiamen University, School of Informatics, Department of Software Engineering, China; (3) Xiamen University, Art School, China

Source title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference

Abbreviated source title: IMCEC - IEEE Adv. Inf. Manag., Commun., Electron. Autom. Control Conf.

Part number: 1 of 1

Issue title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference

Issue date: June 18, 2021

Publication year: 2021

Pages: 1095-1099

Language: English

ISSN: 2693-2814

E-ISSN: 2693-2776

ISBN-13: 9781728185347

Document type: Conference article (CA)

Conference name: 4th IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference, IMCEC 2021

Conference date: June 18, 2021 - June 20, 2021

Conference location: Chongqing, China

Conference code: 170540

Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Global Union Academy of Science and Technology; IEEE Beijing Section

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: With the improvement of information system of the insurance industry, the insurance company has accumulated a large number of vehicle insurance data. How to use these vast amounts of data resources more

efficiently has become an urgent problem for the insurance industry to be solved, and data mining technology can solve the above problems. In this paper, decision tree algorithm is used for auto insurance business data mining and analysis, build a customer risk analysis model, which effectively reduces the risk of underwriting insurance companies.
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Number of references: 5

Main heading: Data mining

Controlled terms: Decision trees - Insurance - Risk analysis - Risk assessment - Vehicles

Uncontrolled terms: Business data - Customer risks - Data mining technology - Data resources - Decision-tree algorithm - Insurance companies - Insurance industry - Number of vehicles - Urgent problems - Vehicle insurance

Classification code: 723.2 Data Processing and Image Processing - 914.1 Accidents and Accident Prevention - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922 Statistical Methods - 961 Systems Science

DOI: 10.1109/IMCEC51613.2021.9482172

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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82. Two-dimensional intermetallic PtBi/Pt core/shell nanoplates overcome tumor hypoxia for enhanced cancer therapy

Accession number: 20213510847596

Authors: Liu, Yongchun (1); Li, Xinhao (1); Shi, Yu (1); Wang, Youjuan (2); Zhao, Xiaojing (3); Gong, Xiangyang (2); Cai, Ren (1); Song, Guosheng (2); Chen, Mei (1); Zhang, Xiaobing (2)

Author affiliation: (1) College of Materials Science and Engineering, Hunan University, Changsha; 410082, China; (2) State Key Laboratory of Chemo/Biosensing and Chemometrics, College of Chemistry and Chemical Engineering, Hunan University, Changsha; 410082, China; (3) College of Chemistry and Materials, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Chen, Mei(chenmei@hnu.edu.cn)

Source title: Nanoscale

Abbreviated source title: Nanoscale

Volume: 13

Issue: 33

Issue date: September 7, 2021

Publication year: 2021

Pages: 14245-14253

Language: English

ISSN: 20403364

E-ISSN: 20403372

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: The design of multifunctional nanoplateforms is of great importance for improving hypoxia-induced therapeutic outcomes, especially for overcoming radiotherapy (RT) tolerance. Here, two-dimensional intermetallic PtBi/Pt nanoplates (PtBi NPs) were designed as a therapeutic platform to in situ generate oxygen, and thereby overcome tumor hypoxia for boosting photothermal/radiotherapy (PTT/RT). With high X-ray attenuation coefficient, PtBi NPs exhibited outstanding radiotherapy sensitization characteristics. Moreover, the high photothermal effect of PtBi NPs could promote the catalytic activity of PtBi NPs to achieve a synergistic PTT/RT effect. PEGylated PtBi NPs (PtBi-PEG) exhibited excellent biocompatibility, prolonged blood circulation time and enhanced tumor accumulation. Finally, PtBi-PEG showed excellent trimodal contrast enhancement for infrared (IR) imaging, photoacoustic (PA) imaging and X-ray imaging, facilitating imaging-guided cancer therapy. Thus, our work highlights PtBi-PEG as a novel multifunctional theranostic nanoplateform with great potential for future multimodal imaging-guided synergistic cancer therapy. This journal is © The Royal Society of Chemistry.

Number of references: 39

Main heading: Platinum alloys

Controlled terms: Biocompatibility - Bismuth alloys - Cardiovascular system - Catalyst activity - Diseases - Intermetallics - Nanostructures - Oncology - Radiotherapy - Theranostics - Tumors

Uncontrolled terms: Blood circulation - Cancer therapy - Contrast Enhancement - Multi-modal imaging - Photothermal effects - Therapeutic outcomes - Tumor accumulation - X-ray attenuation coefficient

Classification code: 461 Bioengineering and Biology - 531.1 Metallurgy - 547.1 Precious Metals - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 933 Solid State Physics

DOI: 10.1039/d1nr02561a

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

83. Ligand-Induced Motion and Self-Assembly Pathways between Nanocubes

Accession number: 20211410179454

Authors: Zhang, Junyu (1); Zhang, Xue (2); Yang, Dapeng (3); Zhao, Peng (1)

Author affiliation: (1) Instrumental Analysis Center, Laboratory and Equipment Management Department, Huaqiao University, Xiamen; 361021, China; (2) Institute of Advanced Materials Science and Engineering, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen; 518055, China; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Zhang, Junyu(zjy2020@hqu.edu.cn); Zhang, Xue(xzhang0207@163.com); Yang, Dapeng(yangdp@qztc.edu.cn)

Source title: Journal of Physical Chemistry Letters

Abbreviated source title: J. Phys. Chem. Lett.

Volume: 12

Issue: 9

Issue date: March 11, 2021

Publication year: 2021

Pages: 2429-2436

Language: English

E-ISSN: 19487185

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: Nanoparticle motion and self-assembly have been regarded as a promising pathway for forming ordered nanostructures. However, the detailed dynamics processes induced by ligand involvement remained poorly understood. Here, we used in situ liquid-cell electron microscopy technology to image the formation of face-to-face Pt cube ordered structures: pairs, linear chains, and squares. The van der Waals interaction between the two neighboring cubes was quantified in real time. Interestingly, the two different formation processes of the square phase were achieved via a rotational and translational method. It is found that the space between two neighboring cubes was the same as the ex-TEM results. The density functional theory calculation demonstrated that it was attributed to the DMF ligand interactions of the cubes that promoted their face-to-face attachment. ©

Number of references: 37

Main heading: Self assembly

Controlled terms: Density functional theory - Geometry - Ligands - Van der Waals forces

Uncontrolled terms: Formation process - Induced motions - Ligand interactions - Linear chain - Ordered nanostructures - Ordered structures - Space between - Van Der Waals interactions

Classification code: 801.4 Physical Chemistry - 921 Mathematics - 922.1 Probability Theory - 951 Materials Science

DOI: 10.1021/acs.jpcllett.1c00254

Funding Details: Number: 22001083, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This work was financially supported by youth program of the National Natural Science Foundation of China (22001083).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

84. Model of the influence of Internet finance on monetary policy based on gibbs sampling and vector autoregression

Accession number: 20211610235510

Authors: Wang, Hui (1); Huang, Shiwang (2)

Author affiliation: (1) School of Finance, Nanjing University of Finance Economics, Nanjing, China; (2) Department of Financial Engineering, Business School, Quanzhou Normal University, China

Corresponding author: Huang, Shiwang(iseusa@sina.com)

Source title: Journal of Intelligent and Fuzzy Systems

Abbreviated source title: J. Intelligent Fuzzy Syst.

Volume: 40

Issue: 4

Issue date: 2021

Publication year: 2021

Pages: 6505-6515

Language: English

ISSN: 10641246

E-ISSN: 18758967

Document type: Journal article (JA)

Publisher: IOS Press BV

Abstract: The various parts of the traditional financial supervision and management system can no longer meet the current needs, and further improvement is urgently needed. In this paper, the low-frequency data is regarded as the missing of the high-frequency data, and the mixed frequency VAR model is adopted. In order to overcome the problems caused by too many parameters of the VAR model, this paper adopts the Bayesian estimation method based on the Minnesota prior to obtain the posterior distribution of each parameter of the VAR model. Moreover, this paper uses methods based on Kalman filtering and Kalman smoothing to obtain the posterior distribution of latent state variables. Then, according to the posterior distribution of the VAR model parameters and the posterior distribution of the latent state variables, this paper uses the Gibbs sampling method to obtain the mixed Bayes vector autoregressive model and the estimation of the state variables. Finally, this article studies the influence of Internet finance on monetary policy with examples. The research results show that the method proposed in this article has a certain effect. © 2021 - IOS Press. All rights reserved.

Number of references: 25

Main heading: Parameter estimation

Controlled terms: Bayesian networks - Finance - Regression analysis - Value engineering

Uncontrolled terms: Bayesian estimation methods - Gibbs sampling methods - High frequency data - Low-frequency data - Management systems - Posterior distributions - Vector autoregressions - Vector autoregressive model

Classification code: 911.5 Value Engineering - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics

DOI: 10.3233/JIFS-189489

Funding Details: Number: 2018SJA0245, Acronym: -, Sponsor: -; Number: KYC201616, Acronym: NUFE, Sponsor: Nanjing University of Finance and Economics;

Funding text: The study is financially supported by Jiangsu Government Scholarship for Overseas Studies 2018, Jiangsu Provincial Research Fund for Philosophy and Social Sciences in Universities and Colleges (2018SJA0245), Research Grants of NUFE (KYC201616) and Course Construction & Development Fund in School of Finance at NUFE.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

85. Eutrophication and lakes dynamic conditions control the endogenous and terrestrial POC observed by remote sensing: Modeling and application ([Open Access](#))

Accession number: 20212610556931

Authors: Zhao, Zhilong (1); Huang, Changchun (1, 2, 3, 4); Meng, Lize (1); Lu, Lingfeng (1); Wu, Yongfang (1); Fan, Rong (1); Li, Shuaidong (1); Sui, Zhengwei (7); Huang, Tao (1, 2, 3, 4); Huang, Chulong (8); Yang, Hao (1, 2, 3, 4); Zhang, Limin (5, 6)

Author affiliation: (1) School of Geography, Nanjing Normal University, Nanjing; 210023, China; (2) Jiangsu Center for Collaborative Innovation in Geographical Information Resource Development and Application, Nanjing Normal University, Nanjing; 210023, China; (3) Key Laboratory of Virtual Geographic Environment (Nanjing Normal University), Ministry of Education, Nanjing; 210023, China; (4) State Key Laboratory Cultivation Base of Geographical Environment Evolution (Jiangsu Province), Nanjing; 210023, China; (5) Jiangsu Engineering Lab of Water and Soil Eco-remediation, Nanjing Normal University, Nanjing; 210023, China; (6) Green Economy Development Institute, Nanjing University of Finance and Economics, Nanjing; 210023, China; (7) China Center for Resources Satellite Data and Application, Professor, 18600200660, China; (8) Department of Resources and Environmental Sciences, Quanzhou Normal University, 398, Donghai Street, Quanzhou; 362000, China

Corresponding author: Huang, Changchun(huangchangchun@njnu.edu.cn)

Source title: Ecological Indicators
Abbreviated source title: Ecol. Indic.
Volume: 129
Issue date: October 2021
Publication year: 2021
Article number: 107907
Language: English
ISSN: 1470160X
Document type: Journal article (JA)
Publisher: Elsevier B.V.

Abstract: The sources of particulate organic carbon (POC) determine its conversion, thereby playing an important role in the carbon cycle of lakes. Accurate estimation of the sources and dynamic characteristics of POC is important for understanding the migration and transformation of organic carbon. However, the synchronous observation of POC sources with large areas through remote sensing is still challenging because of the complex composition of POC and the optical conditions of inland lakes. In this study, a three-band ($1/Rrs(689) - 1/Rrs(717) \times Rrs(697)$) empirical algorithm of POC sources was constructed based on remote sensing reflectance ($Rrs(\#)$) and the proportion of endogenous POC estimated from the field-measured stable isotope ($\delta^{13}C_{POC}$) values. The validation and calibration results of the three-band algorithm showed robust performance, with MAPE and RMSE of estimated values and measured values of 10% and 0.07, respectively. The three-band algorithm had good simulation results for the Ocean and Land Color Instrument (OLCI), Moderate Imaging Spectroradiometer (MODIS), Geostationary Ocean Color Imager (GOCI), and Medium Resolution Imaging Spectrometer (MERIS) spectra. The POC sources estimated by the three-band algorithm suggest that the endogenous POC of Taihu Lake in August showed a decreasing trend from 2006 to 2019. The variation in terrestrial POC was slow and stable for both annual and monthly variations. The analysis of POC sources with total phosphorus (TP), total nitrogen (TN), water temperature, and wind speed indicated that terrestrial POC was closely related to wind speed ($r = 0.33$, $P < 0.05$). © 2021 The Author(s)

Number of references: 71

Main heading: Organic carbon

Controlled terms: Eutrophication - Isotopes - Lakes - Radiometers - Remote sensing - Spectrometers - Temperature - Wind

Uncontrolled terms: Carbon cycles - Carbon source - Particulate organic carbon - Particulate organic carbon source - Remote-sensing - Stable isotopes - Total nitrogen - Total phosphorus - Water temperatures - Wind speed

Classification code: 443.1 Atmospheric Properties - 641.1 Thermodynamics - 741.3 Optical Devices and Systems - 804.1 Organic Compounds - 944.7 Radiation Measuring Instruments

Numerical data indexing: Percentage 1.00E+01%

DOI: 10.1016/j.ecolind.2021.107907

Funding Details: Number: 41773097, 41877336, 41971286, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This study was financially supported by the National Natural Science Foundation of China (Grant Nos. 41971286, 41773097, and 41877336).

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

86. Crucial roles of 3D–MoO₂–PBC cocatalytic electrodes in the enhanced degradation of imidacloprid in heterogeneous electro–Fenton system: Degradation mechanisms and toxicity attenuation

Accession number: 20212910659871

Authors: Zhang, Chao (1); Li, Feng (1); Zhang, Huike (2); Wen, Rubing (1); Yi, Xiaohui (2); Yang, Yujie (1); He, Junyi (1); Ying, Guang-Guo (2); Huang, Mingzhi (2, 3)

Author affiliation: (1) School of Civil Engineering & Transportation, South China University of Technology, Guangzhou; 510640, China; (2) SCNU Environmental Research Institute, Guangdong Provincial Key Laboratory of Chemical Pollution and Environmental Safety & MOE Key Laboratory of Theoretical Chemistry of Environment, School of Environment, South China Normal University, Guangzhou; 510006, China; (3) School of Resources and Environmental Sciences, Quanzhou Normal University, Quanzhou; Fujian; 362000, China

Corresponding authors: Li, Feng(hjlifeng@scut.edu.cn); Huang, Mingzhi(mingzhi.huang@m.scnu.edu.cn)

Source title: Journal of Hazardous Materials

Abbreviated source title: J. Hazard. Mater.

Volume: 420

Issue date: October 15, 2021

Publication year: 2021

Article number: 126556

Language: English

ISSN: 03043894

E-ISSN: 18733336

CODEN: JHMAD9

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Imidacloprid (IMI), as the most-consumed pesticide, has posed a severe threat to the water ecosystem due to its recalcitrance and inefficient elimination in the traditional wastewater treatment. Herein, a heterogeneous electro-Fenton (EF) system coupled with 3D-MoO₂-porous biochar (PBC) cocatalytic electrodes, abbreviated as 3D-MPE-EF, is initially applied to promote the elimination of IMI in the agrochemical wastewater from pesticide production. The elimination rate of IMI by 3D-MPE-EF system is 18.15 times higher than that by traditional EF system at pH 7.0. The utilization of 3D-MoO₂-PBC electrodes sufficiently compensates for inherent deficiencies of traditional EF system. The circular utilization of Fe is also addressed by 3D-MoO₂-PBC cocatalytic electrodes to reduce the consumption of Fe²⁺ and the deposition of iron mud. Through comparison, MoO₂ is considered the most appropriate cocatalyst in terms of the reutilization of Fe and degradation of IMI. Eight mechanisms are identified in the degradation pathways of IMI by UPLC-Q-TOF-MS. The ecotoxicities of IMI are remarkably attenuated in the 3D-MPE-EF system. This study provides insights into the roles of 3D-MoO₂-PBC cocatalytic electrodes in the enhanced elimination of IMI in heterogeneous EF system. © 2021 Elsevier B.V.

Number of references: 56

Main heading: Electrodes

Controlled terms: Degradation - Insecticides - Iron - Molybdenum oxide - Oxidation - Wastewater treatment

Uncontrolled terms: Bio chars - Cocatalytic electrode - Degradation mechanism - Electro-fenton - Fenton system - Imidacloprids - Neonicotinoids - Porous biochar - System degradation - Water ecosystems

Classification code: 452.4 Industrial Wastes Treatment and Disposal - 545.1 Iron - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally

DOI: 10.1016/j.jhazmat.2021.126556

Funding Details: Number: 2016YFC0402604, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China; Number: 2017B030314057, Acronym: -, Sponsor: Guangdong Provincial Applied Science and Technology Research and Development Program; Number: 41907297, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 41977300, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This study was supported by the National Key Research and Development Program of China (No. 2016YFC0402604), National Natural Science Foundation of China (No. 41977300 and 41907297), Guangdong Provincial Natural Science Foundation (No. 2016A030306033), Key projects of water conservancy science and technology innovation in Guangdong Province (No. 2017-21), Science and Technology Program of Guangzhou (No. 202002020055) and Guangdong Foundation for Program of Science and Technology Research (No. 2017B030314057). The authors are particularly grateful to the editor and anonymous reviewers who help us improve the paper by many insightful comments and suggestions.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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87. Integrate new cross association fuzzy logical relationships to multi-factor high-order forecasting model of time series

Accession number: 20211910311628

Authors: Li, Fang (1); Yu, Fusheng (2, 3); Wang, Xiao (4); Yang, Xiyang (5); Liu, Shihu (6); Liu, Yuming (3)

Author affiliation: (1) Department of Mathematics, College of Arts and Sciences, Shanghai Maritime University, Shanghai; 201306, China; (2) School of Mathematics and Statistics, Minnan Normal University, Zhangzhou; Fujian; 363000, China; (3) School of Mathematical Sciences, Beijing Normal University, Beijing; 100875, China; (4) School of Economics and Management, Beijing Institute of Petrochemical Technology, Beijing; 102617, China; (5) Fujian Provincial Key Laboratory of Data Intensive Computing, Quanzhou Normal University, Quanzhou; 362000, China; (6) School of Mathematics and Computer Sciences, Yunnan Minzu University, Kunming; 650500, China

Corresponding author: Yu, Fusheng(yufusheng@bnu.edu.cn)

Source title: International Journal of Machine Learning and Cybernetics

Abbreviated source title: Intl. J. Mach. Learn. Cybern.

Volume: 12

Issue: 8

Issue date: August 2021

Publication year: 2021

Pages: 2297-2315

Language: English

ISSN: 18688071

E-ISSN: 1868808X

Document type: Journal article (JA)

Publisher: Springer Science and Business Media Deutschland GmbH

Abstract: In any multi-factor high-order fuzzy logical relationship (FLR) based forecasting model, a FLR reflects the influence of both the main factor (the forecasted factor) and all the influence factors on the main factor. Thus, the antecedent of a FLR includes multiple premises related to the main factor as well as all the influence factors. In real time series, there may exist another kind of influence: the cross association influence which is from a part of influence factor(s) on the main factor. To describe such kind of influence, we propose the concept of multi-factor high-order cross association FLRs (CAFLRs). The antecedent of a CAFLR includes some premises related to a part of influence factors. The proposed CAFLRs are divided into two categories: short-cross association FLRs and long-cross association FLRs, which describe the influence on the consequent observation from the premise observations at the closest consecutive moments and the premise observations at the non-closest non-consecutive moments respectively. Based on the concept of CAFLRs, a novel forecasting model is built up. In the proposed model, more FLRs than in the existing models can be mined from historical observations and added to the rule base, which further improve the prediction accuracy by raising the possibility of finding available forecasting FLRs. Superior performance of the proposed model has been verified in the experiments by comparing with Nonlinear Autoregressive Neural Networks, Autoregressive Model, Support Vector Regression and some other FLR based forecasting models. © 2021, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

Number of references: 46

Main heading: Fuzzy logic

Controlled terms: Forecasting - Support vector regression - Time series

Uncontrolled terms: Auto regressive models - Autoregressive neural networks - Cross-association - Forecasting modeling - Forecasting models - Fuzzy logical relationships - Historical observation - Prediction accuracy

Classification code: 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 922.2 Mathematical Statistics

DOI: 10.1007/s13042-021-01310-y

Funding Details: Number: -, Acronym: -, Sponsor: Distinguished Young Scientific Research Talents Plan in Universities of Fujian Province; Number: -, Acronym: -, Sponsor: Fujian Provincial Big Data Research Institute of Intelligent Manufacturing; Number: 61966039, 11971065, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This work is supported by the National Natural Science Foundation of China (No. 11971065, No. 61966039), Key Laboratory of Intelligent Computing and Information Processing (Fujian Province University), and Fujian Provincial Big Data Research Institute of Intelligent Manufacturing.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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88. PCR-DGGE Analysis of Bacterial Flora Changes in Processing RTE Abalone

Accession number: 20213810930197

Title of translation: PCR-DGGE

Authors: Zheng, Ruisheng (1, 3); Wu, Yinfeng (1); Zhao, Yunfeng (2); Wang, Qiaoyan (1); Yang, Guiren (1); Zheng, Zongping (1)

Author affiliation: (1) College of Oceanology and Food Science, Quanzhou Normal University, Quanzhou; 362002, China; (2) Analysis and Testing Center, Yancheng Institute of Technology, Yancheng; 224051, China; (3) Ankee Foodstuff Co. Ltd., Quanzhou; 362000, China

Corresponding author: Zhao, Yunfeng(249347905@qq.com)

Source title: Journal of Chinese Institute of Food Science and Technology

Abbreviated source title: J. Chin. Inst. Food Sci. Technol.

Volume: 21

Issue: 8

Issue date: August 31, 2021

Publication year: 2021

Pages: 331-338

Language: Chinese

ISSN: 10097848

Document type: Journal article (JA)

Publisher: Chinese Institute of Food Science and Technology

Abstract: To study the variations of bacterial community in processing RTE abalone, total DNA of abalones bacteria in different processing stages was extracted for PCR-DGGE analysis to study the changing rule of major floras in the process of processing RTE abalone, with the aim to analyze the diversity of spoilage bacteria in spoiled RTE abalone products. The results showed that altogether 19 DGGE predominant bands were detected from five groups of samples, among which there were 4 phylums, 7 classes, and 12 bacterial genus. The common predominant bacteria in five groups of samples were Escherichia, Empedobacter and Serratia. Bacillus cereus, the predominant bacteria found in spoiled RTE abalone, had high tolerance and could remain in late stage of the processing of cooked abalone. So, it was suggested late-stage cooling and packaging environmental health should be controlled strictly in processing to lower the food safety hazard caused by Bacillus, Escherichia, Empedobacter, Serratia and other spoilage bacteria in storage of RTE abalone. © 2021, Editorial Office of Journal of CIFST. All right reserved.

Number of references: 29

Main heading: Spoilage

Controlled terms: Bacillus cereus - Bacteriology - Food storage - Polymerase chain reaction - Shellfish - Thermal processing (foods)

Uncontrolled terms: Bacterial community - Bacterial flora - Bacterial genus - Environmental health - Late stage - PCR-DGGE analysis - Predominant bacteria - Processing stage

Classification code: 461.9 Biology - 801.2 Biochemistry - 822.1 Food Products Plants and Equipment - 822.2 Food Processing Operations

DOI: 10.16429/j.1009-7848.2021.08.036

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

89. The effect of the geometric structure of the modified slot die on the air field distribution in the meltblowing process

Accession number: 20213310766835

Authors: Wang, Yudong (1, 2); Qiu, Yiping (2); Ji, Changchun (1); Wang, Xinhou (2, 3); Guan, Fuwang (4)

Author affiliation: (1) College of Biological and Chemical engineering, Guangxi University of Science and Technology, Liuzhou; 545006, China; (2) Key Laboratory of Textile Science & Technology, College of Textiles, Donghua University, Ministry of Education, Shanghai; 201620, China; (3) College of Mechanical Engineering, Donghua University, Shanghai; 201620, China; (4) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Wang, Xinhou(xhwang@dhu.edu.cn)

Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Issue date: 2021

Publication year: 2021

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Article in Press

Publisher: SAGE Publications Ltd

Abstract: In order to reduce the fiber diameter and the energy consumption in the meltblowing process, a modified slot die with two blocks was designed in this article. The numerical calculation and the experimental verification of the airflow field under the modified slot die were carried out, and the effect of the block structure parameters on the air field was investigated. The research results indicate that compared to the common slot die, the modified slot die with the blocks could increase the velocity on the spinning line and reduce the rate of the temperature decay on the spinning line. When the block width and the block inclination angle lower, and the block height expands, it could increase the peak of the air velocity, the temperature and the turbulence intensity on the center line of the air field under the modified slot die. The average velocity on the spinning line of the modified die under the conditions of block width = 20 mm, block height = 30 mm and block inclination angle = 60° is the highest. © The Author(s) 2021.

Number of references: 28

Main heading: Air

Controlled terms: Energy utilization - Spinning (fibers)

Uncontrolled terms: Experimental verification - Field distribution - Geometric structure - Inclination angles - Melt blowing process - Numerical calculation - Temperature decay - Turbulence intensity

Classification code: 525.3 Energy Utilization - 804 Chemical Products Generally - 819.3 Fiber Chemistry and Processing

Numerical data indexing: Size 2.00e-02m, Size 3.00e-02m

DOI: 10.1177/00405175211035134

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

90. Dual band visible metamaterial absorbers based on four identical ring patches

Accession number: 20204709509948

Authors: Zhang, Yubin (1); Yi, Zao (1); Wang, Xinyue (1); Chu, Peixin (1); Yao, Weitang (1); Zhou, Zigang (1); Cheng, Shubo (2); Liu, Zhimin (3); Wu, Pinghui (4); Pan, Miao (4); Yi, Yougen (5)

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Corresponding authors: Yi, Zao(yizaomy@swust.edu.cn); Pan, Miao(miao_pan@qztc.edu.cn)

Source title: Physica E: Low-Dimensional Systems and Nanostructures

Abbreviated source title: Phys E

Volume: 127

Issue date: March 2021

Publication year: 2021

Article number: 114526

Language: English

ISSN: 13869477

CODEN: PELNFM

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: This paper proposes a dual-frequency tunable ideal visible light metamaterial absorber based on the sub-wavelength range, which achieves perfect absorption in the visible light band. The absorber consists of an Au reflector and a nodal (SiO₂) layer, and a top Au absorber layer. The absorption structure on the top of the absorber adopts the style of ancient Chinese coins and forms a square arrays structure. As a result, the absorber's two absorption peaks are perfect absorption peaks, and the absorption rate can reach 99.9%. In addition, we also researched the influence of adjusting the absorber's geometric parameters on the absorber, and analyzed the absorption mechanism under different circumstances. Through research, it can be known that the absorber has near-perfect dual-band absorption characteristics that do not depend on polarization angle and incident angle insensitivity. Therefore, the absorber designed by us will have a broad application prospect in the filter, solar cell, and so on. © 2020 Elsevier B.V.

Number of references: 59

Main heading: Light

Controlled terms: Gold - Metamaterials - Silica

Uncontrolled terms: Absorption characteristics - Absorption mechanisms - Absorption peaks - Absorption structure - Broad application - Metamaterial absorbers - Polarization angle - Visible light bands

Classification code: 547.1 Precious Metals - 741.1 Light/Optics - 951 Materials Science

Numerical data indexing: Percentage 9.99e+01%

DOI: 10.1016/j.physe.2020.114526

Funding Details: Number: CX20-031, Acronym: SWUST, Sponsor: Southwest University of Science and Technology; Number: 2020YJ0137, Acronym: -, Sponsor: -; Number: JZ20-025, Acronym: -, Sponsor: -; Number: 2018J01559, JAT170469, 2018J05008, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: 2018C088R, Acronym: -, Sponsor: -; Number: 11704223, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: The authors are grateful to the support by National Natural Science Foundation of China (No. 11704223); the Funded by the Natural Science Foundation of Fujian Province (2018J05008 , 2018J01559 , JAT170469); the Funded by the Quanzhou high level Talents Innovation and Entrepreneurship Project (2018C088R);

the Funded by the Southwest University of Science and Technology University Student Innovation Fund Project Precision Funding Special Funding (JZ20-025); the Funded by the Scientific Research Fund of SiChuan Provincial Science and Technology Department (2020YJ0137), and founded by the Innovation Fund Project by Southwest University of Science and Technology (CX20-031).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

91. Influence of polyethyleneimine functionalized graphene on tribological behavior of epoxy composite

Accession number: 20204409404958

Authors: Li, Shuo (1); Zhang, Jianhua (2); Liu, Ming (1); Wang, Rui (3); Wu, Lixin (4)

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Corresponding authors: Liu, Ming(13276083292@163.com); Wang, Rui(wangrui@fjirsm.ac.cn)

Source title: Polymer Bulletin

Abbreviated source title: Polym. Bull.

Volume: 78

Issue: 11

Issue date: November 2021

Publication year: 2021

Pages: 6493-6515

Language: English

ISSN: 01700839

E-ISSN: 14362449

CODEN: POBUDR

Document type: Journal article (JA)

Publisher: Springer Science and Business Media Deutschland GmbH

Abstract: In order to improve the tribological properties of epoxy resin (EP), graphene was functionalized by an amine-rich polymer, polyethyleneimine (PEI) and then fabricated the P-GP/EP composites. The tribological behavior of P-GP/EP composites was investigated by wear testing machine and micro-scratch tester from macroscales and microscales, respectively. Meanwhile, the tensile strength and microhardness were also measured, and the fracture toughness of the composites was evaluated through micro scratch. The results showed that the friction and wear properties of P-GP/EP composites were improved both in macroscales and microscales, and the results of wear resistance were consistent under macro and micro tests. The wear rate in macroscale and volume loss in microscale were 76.76% and 51.34% lower than those of pure EP, respectively. The tensile strength, hardness and fracture toughness of the composites were also improved by the addition of P-GP. The fracture toughness of epoxy composites could be accurately evaluated based on linear elastic fracture mechanics (LEFM). © 2020, Springer-Verlag GmbH Germany, part of Springer Nature.

Number of references: 70

Main heading: Fracture toughness

Controlled terms: Epoxy resins - Fracture mechanics - Graphene - Tensile strength - Testing - Tribology - Wear of materials - Wear resistance

Uncontrolled terms: Epoxy composite - Friction and wear properties - Functionalized graphene - Linear-elastic fracture mechanics - Microscratches - Polyethyleneimine - Tribological behaviors - Tribological properties

Classification code: 761 Nanotechnology - 804 Chemical Products Generally - 815.1.1 Organic Polymers - 931

Classical Physics; Quantum Theory; Relativity

Numerical data indexing: Percentage 5.13e+01%, Percentage 7.68e+01%

DOI: 10.1007/s00289-020-03439-2

Funding Details: Number: 2019T3013, Acronym: -, Sponsor: -; Number: K201705, Acronym: -, Sponsor: -; Number: -, Acronym: CAS, Sponsor: Chinese Academy of Sciences; Number: 51705082, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This project was supported by National Natural Science Foundation of China (Grant No. 51705082), Engineering Research Center for CAD/CAM of Fujian Provincial Colleges and Universities (Grant No. K201705), the Regional Key Program of Science and Technology Service Network Initiative from Chinese Academy of Sciences and the STS Project of Fujian-CAS (Grant No. 2019T3013).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

92. Non-contact vibration sensor using deep learning and image processing

Accession number: 20212910650210

Authors: Guo, Jinquan (1); Wu, Xinran (1); Liu, Jiantao (1, 2); Wei, Tieping (3); Yang, Xiaoxiang (1, 4); Yang, Xinyi (5); He, Bingwei (1); Zhang, Weihao (1)

Author affiliation: (1) School of Mechanical Engineering and Automation, Fuzhou University, Fuzhou; 350108, China; (2) Xiamen Port Holding Group Co. Ltd, Xiamen; Fujian; 361000, China; (3) School of Mechanical and Automation Engineering, Fujian University of Technology, Fuzhou; 350118, China; (4) Quanzhou Normal University, Quanzhou; Fujian; 362000, China; (5) Xiamen Institute of Environmental Science, Xiamen; Fujian; 361000, China

Corresponding author: Liu, Jiantao(liujiantao@gmail.com)

Source title: Measurement: Journal of the International Measurement Confederation

Abbreviated source title: Meas J Int Meas Confed

Volume: 183

Issue date: October 2021

Publication year: 2021

Article number: 109823

Language: English

ISSN: 02632241

CODEN: MSRMDA

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: This paper proposes a non-contact vibration measurement method based on deep learning and image processing. The deep learning method is used to realize the automatic and efficient selection of effective pixels and the optical flow method is used to extract vibration signals to realize non-contact and targetless visual vibration measurement. In this study, a carbon plate board and aluminum C-beam structure were measured and verified under artificial and non-human excitation in a laboratory environment. Additionally, bridge and cable structures in an outdoor environment were selected as measurement targets to verify the reliability of the proposed method. This paper compares the experimental results of Canny and Sobel edge detection algorithms and deep learning methods to verify the efficiency of deep learning. The results demonstrate that our method is robust, even under real-world unfavorable conditions, meaning it can serve as a novel measurement method in the field of vibration measurement. © 2021

Number of references: 35

Main heading: Computer vision

Controlled terms: Deep neural networks - Edge detection - Optical data processing - Optical flows - Photogrammetry - Vibration measurement

Uncontrolled terms: Contact vibration - Convolutional neural network - Deep learning - Images processing - Learning methods - Measurement methods - Non-contact - Noncontact measurements - Optical- - Vibration sensors

Classification code: 405.3 Surveying - 461.4 Ergonomics and Human Factors Engineering - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 741.1 Light/Optics - 741.2 Vision - 742.1 Photography - 943.2 Mechanical Variables Measurements

DOI: 10.1016/j.measurement.2021.109823

Funding text: This work was supported by the National Natural Science Foundation of China under two Grant Numbers 11972005 and 51675103, and 2021 Independent Innovation fund of Tianjin University-Fuzhou University under Grant Number TF2021-5.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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93. Biochar-Supported Cu²⁺/Cu⁺ Composite as an Electrochemical Ultrasensitive Interface for Ractopamine Detection

Accession number: 20210609875201

Authors: Cao, Liping (1, 2); Ding, Qi (2); Liu, Minghuan (1); Lin, Hetong (2); Yang, Da-Peng (1, 2)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou Fujian; 362000, China; (2) College of Food Science, Fujian Agriculture and Forestry University, Fuzhou Fujian; 350002, China

Corresponding authors: Lin, Hetong(hetonglin@163.com); Yang, Da-Peng(yangdp@qztc.edu.cn)

Source title: ACS Applied Bio Materials

Abbreviated source title: ACS Appl. Bio Mater.

Volume: 4

Issue: 2

Issue date: February 15, 2021

Publication year: 2021

Pages: 1424-1431

Language: English

E-ISSN: 25766422

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: Ractopamine as an important β -agonist is frequently found in pork to enhance food quality, which is harmful to human health. Thus, it is extremely important to develop an efficient analytical method to detect ractopamine for food safety control. Herein, we develop a kind of electrochemical biosensor using a biochar-supported $\text{Cu}_2^+/\text{Cu}^+$ composite as an electrochemical sensing interface for detecting ractopamine. The electrochemical sensor combines the collective advantages of Nafion (enriches ractopamine and effectively shields the interference of negatively charged compounds), biochar (unique three-dimensional porous network structure to increase the contact area), and $\text{Cu}_2^+/\text{Cu}^+$ (excellent electrical conductivity to speed up the charge transfer rate), which are beneficial to the accumulation and electrochemical sensing of targets on a Nafion-biochar-supported $\text{Cu}_2^+/\text{Cu}^+$ electrode (NBC-GCE). The as-prepared sensor shows a good electrochemical sensing ability, with an ultralow detection limit and high sensitivity ($0.041 \mu\text{M}$ and $416 \mu\text{A}\cdot\text{mM}^{-1}\cdot\text{cm}^{-2}$, respectively), in the $0.1\text{--}1.75 \mu\text{M}$ range. In addition, the stability, repeatability, and anti-interference performance of the modified electrode are also satisfying. Last, its practicability is shown for assaying ractopamine in pork sausages. This research provides an environmentally friendly method to simultaneously treat food waste and achieve ultrasensitive detection of ractopamine in food. ©

Number of references: 40

Main heading: Electrochemical sensors

Controlled terms: Charge transfer - Electrochemical electrodes - Food additives - Food safety - Food waste - Meats

Uncontrolled terms: Charge-transfer rate - Electrical conductivity - Electrochemical biosensor - Electrochemical sensing - Food safety control - Modified electrodes - Porous network structures - Ultrasensitive detection

Classification code: 801 Chemistry - 802.2 Chemical Reactions - 822.3 Food Products

DOI: 10.1021/acsabm.0c01314

Funding Details: Number: 2019H0023, Acronym: -, Sponsor: Fujian Provincial Department of Science and Technology; Number: 2017G023, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: The authors are very grateful to the Orientative Project sponsored by the Fujian Provincial Department of Science and Technology through the Grant Number 2019H0023 and to the Quanzhou City Science & Technology Program of China (Grant Number 2017G023).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

94. Ultrahigh Quality Factor Photonic Nanojets Generated by Truncated Microtoroid Structures (Open Access)

Accession number: 20213110716754

Authors: Chen, Yajie (1); Wang, Ying (1); Zeng, Xintao (1); Pan, Shifa (1); Chen, Musheng (1); Zeng, Yongxi (1); Fu, Baoyu (1); Wu, Pinghui (1); Pan, Miao (1)

Author affiliation: (1) Research Center for Photonic Technology, Fujian Provincial Key Laboratory for Advanced Micro-nano Photonics Technology and Devices, Key Laboratory of Information Functional Material for Fujian Higher Education, Quanzhou Normal University, Quanzhou, China

Corresponding authors: Wu, Pinghui(phwu@zju.edu.cn); Pan, Miao(miao_pan@qztc.edu.cn)

Source title: IEEE Photonics Journal

Abbreviated source title: IEEE Photon. J.

Volume: 13

Issue: 4

Issue date: August 2021

Publication year: 2021

Article number: 9497753

Language: English

E-ISSN: 19430655

Document type: Journal article (JA)

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: A photonic nanojet (PNJ) is a highly confined light beam that focuses from the shadow side of microparticles. In 46.47 λ this work, we propose a PNJ with ultrahigh quality factor formed by dielectric truncated microtoroid. The key properties of PNJ, such as the maximum intensity, the length of PNJ, the full-width at half maximum (FWHM), are studied in detail using finite-difference time-domain (FDTD) analysis. The results show that a PNJ with an enhanced intensity of 55.21 times to the incident light, superlong length of 46.47 λ and subwavelength FWHM of 0.77 λ is formed by semi-microtoroid, thus, an ultrahigh quality factor of 3308.68 is achieved. More importantly, the properties of the PNJ are tunable by changing the truncated proportions of the microtoroid. The structure we proposed has the advantages of compact structure and simple experimental operation, which is expected to apply in many research fields, including optical detection, optical data storage, super-resolution image, nanopattern, nanolithography, and so on. © 2009-2012 IEEE.

Number of references: 35

Main heading: Finite difference time domain method

Controlled terms: Digital storage - Full width at half maximum - Nanophotonics - Optical image storage - Time domain analysis

Uncontrolled terms: Compact structures - Maximum intensities - Micro-particles - Optical detection - Photonic nanojet - Photonic nanojets - Quality factors - Super resolution

Classification code: 722.1 Data Storage, Equipment and Techniques - 741.1 Light/Optics - 921 Mathematics

DOI: 10.1109/JPHOT.2021.3100136

Funding Details: Number: C18032, Acronym: -, Sponsor: -; Number: 11704223, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018J05008, 2019J01736, 2020J01777, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province;

Funding text: Manuscript received May 31, 2021; revised July 10, 2021; accepted July 21, 2021. Date of publication July 27, 2021; date of current version August 10, 2021. This work was supported in part by the National Natural Science Foundation of China under Grant 11704223, in part by the Natural Science Foundation of Fujian Province under Grants 2018J05008, 2019J01736, and 2020J01777, and in part by the Distinguished Young Scholars Program of Fujian Province under Grant C18032. (Corresponding author: Pinghui Wu and Miao Pan.) The authors are with the Research Center for Photonic Technology, Fujian Provincial Key Laboratory for Advanced Micro-nano Photonics Technology and Devices & Key Laboratory of Information Functional Material for Fujian Higher Education, Quanzhou Normal University, Quanzhou 362000, China (e-mail: cheney_jie@outlook.com; ailsa_ying0316@outlook.com; zeng_xintao@163.com; panshifa@qztc.edu.cn; mushengchen@163.com; clmzyx@163.com; fubaoyu@qztc.edu.cn; phwu@zju.edu.cn; miao_pan@qztc.edu.cn). Digital Object Identifier 10.1109/JPHOT.2021.3100136

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

95. A clustering based variable sub-window approach using particle swarm optimisation for biomedical sensor data monitoring

Accession number: 20191706827895

Authors: Lan, Kun (1); Fong, Simon (1); Liu, Lian-Sheng (2); Wong, Raymond K. (3); Dey, Nilanjan (4); Millham, Richard C. (5); Wong, Kelvin K.L. (6)

Author affiliation: (1) Department of Computer and Information Science, University of Macau, Taipa, China; (2) First Affiliated Hospital of Guangzhou University of TCM, Guangzhou; Guangdong, China; (3) School of Computer Science and Engineering, University of New South Wales, Sydney; NSW, Australia; (4) Department of Information Technology, Techno India College of Technology, Kolkata; West Bengal, India; (5) Department of Information Technology, Durban University of Technology, Durban, South Africa; (6) Faculty of Mathematics and Computer Science, Quanzhou Normal University, Quanzhou; Fujian, China

Corresponding author: Wong, Kelvin K.L.(kelvinwkl@hotmail.com)

Source title: Enterprise Information Systems

Abbreviated source title: Enterp. Inf. Syst.

Volume: 15

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Issue date: 2021

Publication year: 2021

Pages: 15-35

Language: English

ISSN: 17517575

E-ISSN: 17517583

Document type: Journal article (JA)

Publisher: Taylor and Francis Ltd.

Abstract: Advances in information technologies enable data to be ubiquitously generated from sensors, especially in the industrial healthcare research and application fields. The aim is to develop an adaptive windowing pre-processing approach using clustering-based metaheuristics search for biomedical data stream classification, which uses a sliding window to scan the multivariate data stream segment to segment. Our new model is put under test with other temporal data stream pre-processing methods on those biomedical sensor datasets. The experiments give higher accuracy and less time cost especially in dynamically adjusting the window size according to clustering outcomes that are optimised by metaheuristics. © 2019 Informa UK Limited, trading as Taylor & Francis Group.

Number of references: 30

Main heading: Data streams

Controlled terms: Biosensors - Data mining - Health care - Heuristic algorithms - Industrial research - Particle swarm optimization (PSO) - Processing - Sensors

Uncontrolled terms: Adaptive windowing - Biomedical sensors - Data stream mining - Meta heuristics - Particle swarm optimisation - Pre-processing - Pre-processing method - Research and application

Classification code: 461.7 Health Care - 723 Computer Software, Data Handling and Applications - 901.3

Engineering Research - 913.4 Manufacturing

DOI: 10.1080/17517575.2019.1597388

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

96. Necklace-like hybrid nanofiber as an enhanced and recyclable intrinsic photocatalyst for tetracycline removal and hydrogen evolution

Accession number: 20214110991609

Authors: Zhang, Hongjie (1, 2); Zhao, Jian (2); Piao, Hongwei (2); Huang, Qinglin (2); Hu, Jiaoneng (2); Xia, Yanling (3); Zhang, Meiling (2)

Author affiliation: (1) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; Fujian; 362000, China; (2) State Key Laboratory of Separation Membranes and Membrane Processes, National Center for International Joint Research on Separation Membranes, Department of Material Science and Engineering, School of Textile Science and Engineering, Tiangong University, Tianjin; 300387, China; (3) Technical Department of Tianjin Baode Packing Company, Tianjin, China

Corresponding author: Zhao, Jian(zhaojian@tiangong.edu.cn)

Source title: Materials Today Communications

Abbreviated source title: Mater. Today Commun.

Volume: 29

Issue date: December 2021

Publication year: 2021

Article number: 102761

Language: English

E-ISSN: 23524928

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Recycling of nanophotocatalyst in slurry system is still a challenge due to its powder form. Here, polyacrylonitrile with nanophotocatalyst (CdS, Cd@TiO₂, and CdS@void@TiO₂, respectively) and vanadyl acetylacetonate as a potential oxidant was electrospun into nanofiber membrane. After sintering and acidification, polypyrrole (PPy) was coated via V⁵⁺ oxidation polymerization, and the necklace-like nanofiber photocatalyst (nanophotocatalyst@PPy NFs) was yielded. After calcination and PPy covering, nanophotocatalyst@PPy NFs with ternary heterojunctions have the narrow energy gap of ~1.6 eV and broad response in UV and visible light region. The maximum removal efficiency of the nanophotocatalyst@PPy NF can reach up to ~77% for tetracycline, and H₂ evolution rate raises up to 654.7 μmol h⁻¹ g⁻¹. With the protection of PPy covering,

nanophotocatalyst@PPy NFs possess outstanding resistance to photocorrosion. As a recyclable fiber-form photocatalyst, our nanophotocatalyst@PPy NFs with commendable photocatalytic activity and stable performance as well as easy handling and recycling show great promise for environmental remediation. © 2021 Elsevier Ltd

Number of references: 41

Main heading: Hydrogen production

Controlled terms: Cadmium sulfide - Heterojunctions - II-VI semiconductors - Nanofibers - Photocatalytic activity - Polypyrroles - Recycling - Sintering - Titanium dioxide

Uncontrolled terms: Electrospuns - Hybrid nanofiber - Hydrogen-evolution - Nanofiber membrane - Nanophotocatalyst - Necklace-like fiber - Pollutants removal - Recyclables - Slurry system - Vanadyl acetylacetonate

Classification code: 452.3 Industrial Wastes - 522 Gas Fuels - 712.1 Semiconducting Materials - 714.2

Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 815.1.1 Organic Polymers - 933 Solid State Physics

Numerical data indexing: Amount of substance 6.547E-04mol, Electron volt 1.60E+00eV, Percentage 7.70E+01%

DOI: 10.1016/j.mtcomm.2021.102761

Funding Details: Number: 18JCZDJC37000, Acronym: -, Sponsor: Natural Science Foundation of Tianjin City;

Funding text: This work was supported by the Young Elite Scientists Sponsorship Program by China Association for Science and Technology (No. YESS20160168), the National Advanced Functional Fiber Innovation Center of China (2020-fx020013), the Quanzhou Home-bay Recruitment Program of Global Talents, China (2017ZT002), the Natural Science Foundation of Tianjin, China (18JCZDJC37000), the Tianjin Training Program for College Students' Innovation and Entrepreneurship, China (202010058072), and Scientific research project of Tianjin Municipal Education Commission, China (No. 2019KJ002).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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97. Ankle muscle activations during different foot-strike patterns in running (Open Access)

Accession number: 20212010356594

Authors: Lin, Jian-Zhi (1); Chiu, Wen-Yu (1); Tai, Wei-Hsun (2); Hong, Yu-Xiang (1); Chen, Chung-Yu (1)

Author affiliation: (1) Department of Physical Education, National Taiwan University of Sport, Taichung; 40404, Taiwan; (2) School of Physical Education, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Chiu, Wen-Yu(wychiu@ntus.edu.tw); Chen, Chung-Yu(chungyu@ntus.edu.tw)

Source title: Sensors

Abbreviated source title: Sensors

Volume: 21

Issue: 10

Issue date: May 2, 2021

Publication year: 2021

Article number: 3422

Language: English

ISSN: 14248220

Document type: Journal article (JA)

Publisher: MDPI AG

Abstract: This study analysed the landing performance and muscle activity of athletes in forefoot strike (FFS) and rearfoot strike (RFS) patterns. Ten male college participants were asked to perform two foot strikes patterns, each at a running speed of 6 km/h. Three inertial sensors and five EMG sensors as well as one 24 G accelerometer were synchronised to acquire joint kinematics parameters as well as muscle activation, respectively. In both the FFS and RFS patterns, according to the intraclass correlation coefficient, excellent reliability was found for landing performance and muscle activation. Paired t tests indicated significantly higher ankle plantar flexion in the FFS pattern. Moreover, biceps femoris (BF) and gastrocnemius medialis (GM) activation increased in the pre-stance phase of the FFS compared with that of RFS. The FFS pattern had significantly decreased tibialis anterior (TA) muscle activity compared with the RFS pattern during the pre-stance phase. The results demonstrated that the ankle strategy focused on controlling the foot strike pattern. The influence of the FFS pattern on muscle activity likely indicates that an athlete can increase both BF and GM muscles activity. Altered landing strategy in cases of FFS pattern may contribute both to the running efficiency and muscle activation of the lower extremity. Therefore, neuromuscular training and education are required to enable activation in dynamic running tasks. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

Number of references: 40

Main heading: Muscle

Controlled terms: Chemical activation - Sports

Uncontrolled terms: Ankle strategies - Intraclass correlation coefficients - Joint kinematics - Muscle activation - Muscle activities - Running efficiency - Tibialis anterior - Training and education

Classification code: 461.2 Biological Materials and Tissue Engineering - 461.3 Biomechanics, Bionics and Biomimetics - 804 Chemical Products Generally

Numerical data indexing: Velocity 1.67e+00m/s

DOI: 10.3390/s21103422

Funding Details:

Funding text: We thank National Taiwan University of Sport for providing the biomechanical lab used in this project.

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

98. Research on the influence of attention and emotion of tea drinkers based on artificial neural network (Open Access)

Accession number: 20211910324739

Authors: Hong, Biyun (1); Zhang, Yang (2)

Author affiliation: (1) Anxi College of Tea Science, Fujian Agriculture and Forestry University, China; (2) Fine Art and Design College, Quanzhou Normal University, China

Corresponding author: Zhang, Yang(490274603@qq.com)

Source title: Mathematical Biosciences and Engineering

Abbreviated source title: Math. Biosci. Eng.

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Pages: 3423-3434

Language: English

ISSN: 15471063

E-ISSN: 15510018

Document type: Journal article (JA)

Publisher: American Institute of Mathematical Sciences

Abstract: Tea can help to regulate the mood of human. Based on the influence of tea on people's mood and attention, this study explored the tea concentration when the mood and attention of drinkers are in the best state, and established the best concentration model of tea. Using sampling experiment method to collect objective data, which are then combined with questionnaire survey method to collect subjective data, using the results to establish a neural network algorithm model to test the accuracy of the neural network algorithm model. Experiments show that the correlation coefficient of the output value of the BP neural network model constructed in this study is basically consistent with the actual prediction result. After obtaining data such as age, gender, frequency of tea drinking, and tea drinking concentration of tea drinkers, the constructed back propagation (BP) neural network model can accurately predict the mental state score of tea drinkers. The research will provide certain data support and theoretical basis for the follow-up development of the tea industry. Follow-up work needs to be performed in order to further adjust the scope and accuracy of the control model. Then, a more complete and accurate advanced BP neural network model can be established for different types of tea and other parameters. ©2021 the Author(s), licensee AIMS Press.

Number of references: 22

Main heading: Neural networks

Controlled terms: Backpropagation - Data acquisition - Surveys - Tea

Uncontrolled terms: Back propagation neural networks - BP neural network model - Concentration model -

Correlation coefficient - Experiment methods - Neural network algorithm - Output values - Questionnaire surveys

Classification code: 723.2 Data Processing and Image Processing - 723.4 Artificial Intelligence

DOI: 10.3934/MBE.2021171

Funding Details: Number: -, Acronym: QNU, Sponsor: Quanzhou Normal University;

Funding text: The research was supported by data from Anxi Tea Science College of Fujian Agriculture and Forestry University and Art and Design College of Quanzhou Normal University.

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

99. Dual Antibacterial Effect of In Situ Electrospun Curcumin Composite Nanofibers to Sterilize Drug-Resistant Bacteria (Open Access)

Accession number: 20211610216680

Authors: Liu, Chun-Li (1); Yang, Jun (1); Bai, Xiao-Han (1); Cao, Zhi-Kai (1); Yang, Chen (1); Ramakrishna, Seeram (2); Yang, Da-Peng (3); Zhang, Jun (1); Long, Yun-Ze (1)

Author affiliation: (1) Collaborative Innovation Center for Nanomaterials and Devices, College of Physics, Qingdao University, Qingdao; 266071, China; (2) Center for Nanofibers and Nanotechnology, Department of Mechanical Engineering, National University of Singapore, Singapore; 117574, Singapore; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Zhang, Jun(iamjunzhang@163.com); Long, Yun-Ze(yunze.long@qdu.edu.cn)

Source title: Nanoscale Research Letters

Abbreviated source title: Nanoscale Res. Lett.

Volume: 16

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Issue date: 2021

Publication year: 2021

Article number: 54

Language: English

ISSN: 19317573

E-ISSN: 1556276X

Document type: Journal article (JA)

Publisher: Springer

Abstract: Bacterial infection especially caused by multidrug-resistant bacteria still endangers human life. Photodynamic therapy (PDT) can effectively kill bacteria, and nanofiber-based PDT can effectively reduce damage to normal tissues. However, current photosensitizers coated on the surfaces of fibers would release to the wound, causing some side effects. And nanofibers prepared by traditional method exhibit poor adhesion on the wound, which severely reduces the PDT effect due to its short-range effect. Herein, core-shell curcumin composite nanofibers are prepared by in situ electrospinning method via a self-made portable electrospinning device. The obtained composite nanofibers show superior adhesiveness on different biological surface than that of traditional preparation method. Upon 808-nm irradiation, these composite nanofibers effectively produced singlet oxygen (1O_2) without curcumin falling off. After these composite nanofibers' exposure to drug-resistant bacteria, they exhibit dual antibacterial behaviors and efficiently kill the drug-resistant bacteria. These dual antibacterial nanofiber membranes with excellent adhesiveness may benefit the application of wound infection as antibacterial dressing. © 2021, The Author(s).

Number of references: 35

Main heading: Drug delivery

Controlled terms: Adhesives - Bacteria - Electrospinning - Nanofibers - Photodynamic therapy - Photosensitizers

Uncontrolled terms: Anti-bacterial behaviors - Antibacterial effects - Bacterial infections - Composite nanofibers - Drug-resistant bacteria - Electrospinning method - Multidrug resistant - Photodynamic therapy (PDT)

Classification code: 461.6 Medicine and Pharmacology - 741.1 Light/Optics - 761 Nanotechnology - 819.3 Fiber Chemistry and Processing - 933 Solid State Physics

Numerical data indexing: Size 8.08e-07m

DOI: 10.1186/s11671-021-03513-2

Funding Details: Number: 11904193,51673103,51973100, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019YFC0121402, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;

Funding text: This work was supported by a grant from the National Natural Science Foundation of China (11904193, 51673103, 51973100) and the National Key Research and Development Project of China (2019YFC0121402).

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

100. Control the surface wettability of thermo-responsive poly(ethylene glycol methyl ether methacrylate-co-triethylene glycol methyl ether methacrylate) thin film by varying temperature

Accession number: 20210809945050

Authors: Chen, Yangyi (1); Pan, Min (1); Hu, Shan hong (1); Qi, Huan (1); Zhang, Chuyang (1)

Author affiliation: (1) Engineering Technology Institute of Ecological Intelligent Fabric in Shishi, College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; 31000, China

Corresponding author: Chen, Yangyi(yy@qztc.edu.cn)

Source title: Key Engineering Materials

Abbreviated source title: Key Eng Mat

Volume: 873 KEM

Part number: 1 of 1

Issue title: Material Engineering Research II - Selected peer-reviewed full text research paper from the 3rd International Conference on Material Engineering Research, ICMER 2020

Issue date: 2021

Publication year: 2021

Pages: 53-58

Language: English

ISSN: 10139826

E-ISSN: 16629795

CODEN: KEMAEY

ISBN-13: 9783035737127

Document type: Conference article (CA)

Conference name: 3rd International Conference on Material Engineering Research, ICMER 2020

Conference date: May 22, 2020 - May 24, 2020

Conference location: Incheon, Korea, Republic of

Conference code: 253699

Publisher: Trans Tech Publications Ltd

Abstract: The surface wettability of thermo-responsive random poly(ethylene glycol methyl ether methacrylate-co-triethylene glycol methyl ether methacrylate), abbreviated as P(MEOMA-co- MEO3MA), was investigated in thin film. UV-Vis spectroscopy shows that the LCST of P(MEOMAcO- MEO3MA) with molar ratios of 0:20, 6:14 and 9:11 were 43oC, 32 oC and 25 oC, respectively. LCST shifts towards lower temperature when molar ratio of MEOMA increases. ATR-FTIR indicates that P(MEOMA-co-MEO3MA) thin film experienced a collapse when the temperature passes its LCST. The contact angle of the paraffin oil on the film decreases 15o when the temperature is above its LCST, which confirms the surface wettability can be controlled. Atomic force microscopy shows the surface of the swollen thin film becomes rougher when above its LCST. © 2021 Trans Tech Publications Ltd, Switzerland.

Number of references: 18

Main heading: Thin films

Controlled terms: Aliphatic compounds - Atomic force microscopy - Contact angle - Engineering research - Ethers - Ethylene - Ethylene glycol - Fourier transform infrared spectroscopy - Molar ratio - Paraffin oils - Polyols - Ultraviolet visible spectroscopy - Wetting

Uncontrolled terms: ATR FTIR - Lower temperatures - Methyl ethers - Surface wettability - Thermo-responsive - Triethylene glycol - UV-vis spectroscopy - Varying temperature

Classification code: 513.3 Petroleum Products - 741.3 Optical Devices and Systems - 801 Chemistry - 804.1 Organic Compounds - 901.3 Engineering Research - 931.2 Physical Properties of Gases, Liquids and Solids

DOI: 10.4028/www.scientific.net/KEM.873.53

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

101. Effects of hydrophobic layer on selective electrochemical nitrogen fixation of self-supporting nanoporous Mo4P3 catalyst under ambient conditions

Accession number: 20210409825492

Authors: Xiao, Lin (1); Zhu, Shengli (1, 2, 3, 4); Liang, Yanqin (1, 2); Li, Zhaoyang (1, 2); Wu, Shuilin (1, 2); Luo, Shuiyuan (4); Chang, Chuntao (5); Cui, Zhenduo (1, 2)

Author affiliation: (1) School of Materials Science and Engineering, Tianjin University, Tianjin; 300350, China; (2) Key Laboratory of Advanced Ceramics and Machining Technology, Ministry of Education, Tianjin; 300350, China; (3) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (4) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China; (5) School of Mechanical Engineering, Dongguan University of Technology, Dongguan; 523808, China

Corresponding authors: Zhu, Shengli(slzhu@tju.edu.cn); Chang, Chuntao(changct@dgut.edu.cn)

Source title: Applied Catalysis B: Environmental

Abbreviated source title: Appl. Catal. B Environ.

Volume: 286

Issue date: June 5, 2021

Publication year: 2021

Article number: 119895

Language: English

ISSN: 09263373

CODEN: ACBEE3

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Electrochemical nitrogen reduction reaction (ENRR) of N₂ to NH₃ under ambient condition offers an environmentally-friendly and sustainable development approach that is expected to replace energy-intensive Haber-Bosch process. However, the ENRR process is suppressed with competition from unavoidable hydrogen evolution reaction (HER). Herein, we modify d-band structure of self-supporting nanoporous Mo₄P₃ (np-Mo₄P₃) catalyst by preparing fluorosilane (FAS) hydrophobic layer on the ligament surface. This approach weakens the absorbability of H and simultaneously prevent water close to active site, further suppress HER. Besides, the self-supporting nanoporous structure provides rich active sites for ENRR. The hydrophobic np-Mo₄P₃ exhibits good ENRR performance, such as high FE of 10.1 % and superior NH₃ yield of 17.3 μg h⁻¹ cm⁻². The hydrophobization method offers an attractive strategy for suppressing HER and could be extended across metal catalyst for ENRR and CO₂ reduction reaction. © 2021 Elsevier B.V.

Number of references: 61

Main heading: Nitrogen fixation

Controlled terms: Ammonia - Hydrogen evolution reaction - Hydrophobicity - Nanocatalysts - Reduction

Uncontrolled terms: Ambient conditions - Attractive strategies - Haber-Bosch process - Hydrophobic layers - Hydrophobizations - Metal catalyst - Nanoporous structures - Nitrogen reduction

Classification code: 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids

Numerical data indexing: Percentage 1.01e+01%

DOI: 10.1016/j.apcatb.2021.119895

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: We gratefully acknowledge support by the National Natural Science Foundation of China (51771131).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

102. One-step synthesis of Mo and S co-doped porous g-C₃N₄ nanosheets for efficient visible-light photocatalytic hydrogen evolution

Accession number: 20203709178897

Authors: Li, Yuanyuan (1); Zhu, Shengli (1, 2, 4); Liang, Yanqin (1); Li, Zhaoyang (1); Wu, Shuilin (1); Chang, Chuntao (3); Luo, Shuiyuan (4); Cui, Zhenduo (1)

Author affiliation: (1) School of Materials Science and Engineering, Tianjin University, Tianjin; 300350, China; (2) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (3) School of Mechanical Engineering, Dongguan University of Technology, Dongguan; 523808, China; (4) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; Fujian; 362000, China

Corresponding author: Zhu, Shengli(slzhu@tju.edu.cn)

Source title: Applied Surface Science

Abbreviated source title: Appl Surf Sci

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Publication year: 2021

Article number: 147743

Language: English

ISSN: 01694332

CODEN: ASUSEE

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Herein, the doping effect of Mo and S on photocatalytic H₂ generation activity of g-C₃N₄ under visible light irradiation is investigated. By using a simple one-step heating technology, Mo and S co-doped porous g-C₃N₄ nanosheets were successfully prepared. The sublimation of sulfur powders promotes the formation of porous g-C₃N₄ nanosheets with large specific surface area. The Mo and S co-doped g-C₃N₄ exhibits efficient visible-light water splitting hydrogen evolution with the noble metallic cocatalyst free. The optimized Mo/S/g-C₃N₄-10 photocatalyst exhibits an extraordinary photocatalytic H₂ evolution rate of 294 $\mu\text{mol g}^{-1}\text{h}^{-1}$ under visible light irradiation ($\lambda > 420 \text{ nm}$). The co-doping of S and Mo extends the optical response range of g-C₃N₄. The doping process and electron transport path are analyzed in details. Mo and S co-doped porous g-C₃N₄ catalysts also exhibit outstanding cycling stability. This work may inspire the facile synthesis of photocatalyst for efficient visible-light water splitting hydrogen evolution. © 2020 Elsevier B.V.

Number of references: 47

Main heading: Light

Controlled terms: Electron transport properties - Hydrogen - Irradiation - Nanosheets - Photocatalytic activity

Uncontrolled terms: Electron transport - Heating technology - Hydrogen evolution - Large specific surface areas - One step synthesis - Photocatalytic H₂ evolution - Photocatalytic hydrogen evolution - Visible-light irradiation

Classification code: 741.1 Light/Optics - 761 Nanotechnology - 804 Chemical Products Generally - 933 Solid State Physics

Numerical data indexing: Size 4.20e-07m

DOI: 10.1016/j.apsusc.2020.147743

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: We gratefully acknowledge support by the National Natural Science Foundation of China (51771131).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

103. The Information Management System of China Forest Products International Trade Based on Internet Platform

Accession number: 20213010687801

Authors: Jiang, Wei (1); Xie, Zhizhong (2)

Author affiliation: (1) College of Economics and Management, Fujian Agriculture and Forestry University, Fuzhou; 350002, China; (2) Tan Siu Lin Business School, Quanzhou Normal University, Quanzhou; 362000, China

Source title: Proceedings - 2021 6th International Conference on Smart Grid and Electrical Automation, ICSGEA 2021

Abbreviated source title: Proc. - Int. Conf. Smart Grid Electr. Autom., ICSGEA

Part number: 1 of 1

Issue title: Proceedings - 2021 6th International Conference on Smart Grid and Electrical Automation, ICSGEA 2021

Issue date: May 2021

Publication year: 2021

Pages: 343-346

Article number: 9470330

Language: English

ISBN-13: 9781665432634

Document type: Conference article (CA)

Conference name: 6th International Conference on Smart Grid and Electrical Automation, ICSGEA 2021

Conference date: May 29, 2021 - May 30, 2021

Conference location: Kunming, China

Conference code: 170392

Sponsor: Hong Kong Intelligent Computation Technology and Automation Association; Xiamen University Tan Kah Kee College

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: In order to promote the efficient management of international trade information of forest products in the Internet era, this paper proposes a new information management system of China forest products international trade based on Internet platform. The system combines a variety of high-tech, such as Internet technology, big data technology, cloud computing technology, Internet of things technology, etc., and gives full play to the unique advantages of these high-tech. Based on this, the system also analyzes the current situation of China's forest products international trade, and optimizes and upgrades the information management of the current international trade of forest products in China. The results show that the system can improve the efficiency of the information management of China's forest products international trade and reduce the pressure of the staff. © 2021 IEEE.

Number of references: 10

Main heading: Information management

Controlled terms: Electric power transmission networks - Electronic commerce - Forestry - Human resource management - International trade - Smart power grids

Uncontrolled terms: Cloud computing technologies - Current situation - Data technologies - Efficient managements - Forest products - Information management systems - Internet of things technologies - Internet technology

Classification code: 706.1 Electric Power Systems - 706.1.1 Electric Power Transmission - 723.5 Computer Applications - 912.2 Management

DOI: 10.1109/ICSGEA53208.2021.00084

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

104. Assessment of Heart Rate and Respiratory Rate for Perioperative Infants Based on ELC Model

Accession number: 20211610228758

Authors: Wang, Qing (1); Zhang, Yi (2); Chen, Guannan (1); Chen, Zhihao (3); Hee, Hwan Ing (4)

Author affiliation: (1) Key Laboratory of OptoElectronic Science and Technology for Medicine of Ministry of Education, Fujian Provincial Key Laboratory of Photonics Technology, Fujian Normal University, Fuzhou; 350007, China; (2) School of Informatics, Xiamen University, Xiamen; 361005, China; (3) Fujian Provincial Key Laboratory of Advanced Micro-Nano Photonics Technology and Devices, Quanzhou Normal University, Quanzhou; 362000, China; (4) DukeNUS Medical School, Singapore; 169857, Singapore

Corresponding authors: Chen, Guannan(edado@fjnu.edu.cn); Chen, Zhihao(zhihaochen@qztc.edu.cn)

Source title: IEEE Sensors Journal

Abbreviated source title: IEEE Sensors J.

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Pages: 13685-13694

Article number: 9399119

Language: English

ISSN: 1530437X

E-ISSN: 15581748

Document type: Journal article (JA)

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: A novel optical fiber sensor using a mesh microbend optical fiber sensor to measure the perioperative heart rate (HR) and respiratory rate (RR) frequency signals was developed by our team. The feasibility of the sensor was evaluated in 10 infants in the perioperative period. We used traditional algorithms, such as Fast Fourier Transformation (FFT) and Wavelet Transformation (WT) to remove the noise and extract the features of the acquired HR and RR signals. However, the nonlinear fitting abilities of those traditional algorithms failed to completely remove the noise hence it was difficult to extract the features effectively. In this paper, we propose a deep learning model EMD-LSTM-CNN (ELC) to process both HR and RR based on Long Short Term Memory (LSTM), Convolutional Neural Network (CNN), and Empirical Modal Decomposition (EMD) methods. The trend term is extracted by EMD from HR and RR. The CNN and LSTM are applied to extract features and process them respectively. The experimental results show that the deep learning model has a better result compared with the traditional FFT and WT algorithms. The proposed model demonstrates compliance with the current standard physiological monitoring method in measuring non-stationary vibration signals such as HR and RR, which promises potential clinical applications in the future. © 2001-2012 IEEE.

Number of references: 31

Main heading: Long short-term memory

Controlled terms: Biomedical signal processing - Convolutional neural networks - Deep learning - Fast Fourier transforms - Heart - Learning systems - Optical fibers - Patient monitoring - Physiological models - Regulatory compliance

Uncontrolled terms: Clinical application - Empirical modal decomposition - Fast fourier transformation (FFT) - Frequency signals - Non-stationary vibration signals - Nonlinear fitting - Physiological monitoring - Wavelet transformations

Classification code: 461.2 Biological Materials and Tissue Engineering - 461.6 Medicine and Pharmacology - 716.1 Information Theory and Signal Processing - 741.1.2 Fiber Optics - 921.3 Mathematical Transformations

DOI: 10.1109/JSEN.2021.3071882

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

105. Exceptional mechanical properties and heat resistance of photocurable bismaleimide ink for 3D printing (Open Access)

Accession number: 20211510214270

Authors: Hua, Wenqiang (1, 2); Lin, Qilang (1); Qu, Bo (2); Zheng, Yanyu (2); Liu, Xiaoying (2); Li, Wenjie (2); Zhao, Xiaojing (2); Chen, Shaoyun (2); Zhuo, Dongxian (2)

Author affiliation: (1) College of Materials Science and Engineering, Fuzhou University, Fuzhou; 350108, China; (2) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Chen, Shaoyun(chshaoy@qztc.edu.cn); Zhuo, Dongxian(dxzhuo@qztc.edu.cn)

Source title: Materials

Abbreviated source title: Mater.

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Issue date: April 1, 2021

Publication year: 2021

Article number: 1708

Language: English

E-ISSN: 19961944

Document type: Journal article (JA)

Publisher: MDPI AG

Abstract: Photosensitive resins used in threedimensional (3D) printing are characterized by high forming precision and fast processing speed; however, they often possess poor mechanical properties and heat resistance. In this study, we report a photocurable bismaleimide ink with excellent comprehensive performance for stereolithography (SLA) 3D printing. First, the main chain of bismaleimide with an amino group (BDM) was synthesized, and then, the glycidyl methacrylate was grafted to the amino group to obtain the bismaleimide oligomer with an unsaturated double bond. The oligomers were combined with reaction diluents and photoinitiators to form photocurable inks that can be used for SLA 3D printing. The viscosity and curing behavior of the inks were studied, and the mechanical properties and heat resistance were tested. The tensile strength of 3Dprinted samples based on BDM inks could reach 72.6 MPa (166% of that of commercial inks), glass transition temperature could reach 155 °C (205% of that of commercial inks), and energy storage modulus was 3625 MPa at 35 °C (327% of that of commercial inks). The maximum values of T5%, T50%, and Tmax of the 3D samples printed by BDM inks reached 351.5, 449.6, and 451.9 °C, respectively. These photocured BDM inks can be used to produce complex structural components and models with excellent mechanical and thermal properties, such as car parts, building models, and pipes. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

Number of references: 40

Main heading: 3D printers

Controlled terms: Acrylic monomers - Curing - Energy storage - Glass transition - Heat resistance - Oligomers - Specific heat - Tensile strength

Uncontrolled terms: Complex structural components - Comprehensive performance - Curing behavior - Forming precision - Glycidyl methacrylate - Mechanical and thermal properties - Photosensitive resins - Unsaturated double bonds

Classification code: 525.7 Energy Storage - 641.1 Thermodynamics - 745.1.1 Printing Equipment - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.1 Organic Compounds - 815.1.1 Organic Polymers

Numerical data indexing: Percentage 1.66e+02%, Percentage 2.05e+02%, Percentage 3.27e+02%, Pressure 3.62e+09Pa, Temperature 7.25e+02K

DOI: 10.3390/ma14071708

Funding Details: Number: S201910399055,S202010399039, Acronym: -, Sponsor: -; Number:

2018CT003,2019J01730,2019Y0042,2020J01770,2020J01773,2020Y0045, Acronym: -, Sponsor: Science and Technology Projects of Fujian Province; Number: 21802085, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019C018R,2020C060, Acronym: -, Sponsor: Science and Technology Bureau of Quanzhou;

Funding text: This research was financially supported by National Natural Science Foundation of China (21802085), the Program for Innovative Research Team in Science and Technology in Fujian Province University (IRTSTFJ), the Science and Technology of Fujian Province (2019Y0042, 2020Y0045, 2019J01730, 2020J01770, 2020J01773), ?

Harbour Program Talent Team Project? of Quanzhou (2018CT003), the Bureau of Science and Technology of Quanzhou (2019C018R, 2020C060), and Student Innovation and Entrepreneurship Training Program of Quanzhou Normal University (S201910399055 and S202010399039).

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

106. Simulation and analysis of the twist propagation process of polyester staple yarn on the fiber scale

Accession number: 20204209350266

Authors: Wang, Jiang (1); Zhang, Yuze (1); Ding, Qian (1); Tayari Akankwasa, Nicholas (1); Shi, Qianqian (1); Li, Liqing (1); Wang, Jun (2); Lin, Huiting (3)

Author affiliation: (1) College of Textiles, Donghua University, China; (2) Key Laboratory of Textile Science & Technology of Ministry of Education, College of Textiles, Donghua University, China; (3) College of Textile and Fashion, Quanzhou Normal University, China

Corresponding author: Wang, Jun(junwang@dhu.edu.cn)

Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Volume: 91

Issue: 7-8

Issue date: April 2021

Publication year: 2021

Pages: 874-884

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Journal article (JA)

Publisher: SAGE Publications Ltd

Abstract: The twisting process of the sliver is an important part of the yarn spinning process, but this process has not been fully characterized on the fiber scale. Herein, based on the assumption that fibers are randomly distributed in the sliver, we analyzed the simulation twisting process of the sliver model on the fiber scale. The mathematical model of the twisting process of the sliver is set up and the non-free-end twisting process is simulated using the finite element software ABAQUS®. The simulation process clearly shows the configuration changes of the sliver caused with the increase of the twist. We also divided the twisting process into 11 stages and obtained a three-dimensional model of staple yarn. Then, the relationship curve between the ring-spun yarn fineness and the number of fibers in the cross-section of the ring-spun yarn was established by spinning the yarns of different counts of 20, 25, 30, 35, 40, 45, 50, 55, 60 and 65 Ne, and the fineness of the simulated yarn was calculated. The accuracy of the simulated yarn was verified by comparing the weight of the simulated yarn and the ring-spun yarn. The model established can be used to predict yarn properties for different purposes and can also be further utilized to study other phenomena in ring-spinning technology. © The Author(s) 2020.

Number of references: 24

Main heading: Spinning (fibers)

Controlled terms: ABAQUS - Fibers - Wool - Yarn

Uncontrolled terms: Propagation process - Randomly distributed - Ring spinning - Ring-spun yarns - Simulation and analysis - Simulation process - Three-dimensional model - Yarn property

Classification code: 819.3 Fiber Chemistry and Processing - 819.4 Fiber Products - 821.4 Agricultural Products - 921 Mathematics

DOI: 10.1177/0040517520963342

Funding Details: Number: CUSF-DH-D-2020022, Acronym: -, Sponsor: -; Number: 11802161,61379011, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019061105, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;

Funding text: The authors disclosed receipt of the following financial support for the research, authorship and/or publication of this article: This work was supported by the Fundamental Research Funds for the Central Universities (Grant No. 2019061105), the Fundamental Research Funds for the Central Universities and Graduate Student Innovation Fund of Donghua University (Grant No. CUSF-DH-D-2020022) and the National Natural Science Foundation of China (Grant No. 61379011, 11802161).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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107. Highly efficient nanoporous CoBP electrocatalyst for hydrogen evolution reaction

Accession number: 20211010026539

Authors: Guang, Hui-Lan (1); Zhu, Sheng-Li (1, 2, 3); Liang, Yan-Qin (1); Wu, Shui-Lin (1); Li, Zhao-Yang (1); Luo, Shui-Yuan (3); Cui, Zhen-Duo (1); Inoue, Akihisa (1, 4, 5)

Author affiliation: (1) School of Materials Science and Engineering, Tianjin University, Tianjin; 300350, China; (2) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (3) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China; (4) International Institute of Green Materials, Josai International University, Togane; 283-8555, Japan; (5) Department of Physics, King Abdulaziz University, Jeddah; 22254, Saudi Arabia

Corresponding author: Zhu, Sheng-Li (slzhu@tju.edu.cn)

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Language: English

ISSN: 10010521

E-ISSN: 18677185

CODEN: RARME8

Document type: Journal article (JA)

Publisher: University of Science and Technology Beijing

Abstract: Abstract: Water splitting is an environment friendly and efficient way to produce hydrogen. Highly efficient and low-cost non-noble metal catalysts play an important role in hydrogen evolution reaction (HER). Dealloying is a simple method to prepare three-dimensional self-supporting nanoporous materials without conductive supports and binders. In this work, we prepared self-supporting nanoporous CoBP electrocatalyst by dealloying method. The influence of the synergistic effect of nonmetallic elements on catalytic activity was investigated. The synergistic electronic effect of Co, B and P atoms on the surface optimizes the H atoms desorption and results in superior HER activity. The bi-continuous structure of nanoporous CoBP provides more active area and favors of electron and electrolyte transfer. The nanoporous CoBP with the B/P atomic ratio of 1/3 exhibits low overpotential of 42 mV at 10 mA·cm⁻², small Tafel slope of 39.8 mV·dec⁻¹ and good long-term stability with no performance decrease for 20 h in alkaline solution. Graphic abstract: [Figure not available: see fulltext.]. © 2021, Youke Publishing Co., Ltd.

Number of references: 55

Main heading: Hydrogen evolution reaction

Controlled terms: Atoms - Binders - Catalyst activity - Dealloying - Electrocatalysts - Electrolytes - Hydrogen - Porous materials - Precious metals - Slope stability

Uncontrolled terms: Continuous structures - Electronic effects - Environment friendly - Long term stability - Nano-porous materials - Non-metallic elements - Non-noble metal catalysts - Synergistic effect

Classification code: 406.2 Roads and Streets - 547.1 Precious Metals - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 931.3 Atomic and Molecular Physics - 951 Materials Science

DOI: 10.1007/s12598-020-01697-7

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This study was financially supported by the National Natural Science Foundation of China (No. 51771131).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

108. Preparation and Property of A Novel Hemoperfusion Adsorbent For Protein-bound Uremic Toxins

Accession number: 20212610549632

Title of translation:

Authors: Liu, Yunhong (1); Peng, Xinyan (1)

Author affiliation: (1) School of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Peng, Xinyan(pengxy1055@163.com)

Source title: Gaodeng Xuexiao Huaxue Xuebao/Chemical Journal of Chinese Universities

Abbreviated source title: Gaodeng Xuexiao Huaxue Xuebao

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Document type: Journal article (JA)

Publisher: Higher Education Press Limited Company

Abstract: Protein-bound uremic toxins(PBUTs), as important risk factors for the progression of chronic kidney disease(CKD), can't be cleared efficiently by traditional hemodialysis method until now. Therefore, it still remains a challenge for developing hemoperfusion adsorbents with enhanced PBUTs removal efficiency. In this work, a facile, one-step method was developed for the synthesis of imidazole-based hypercrosslinked polystyrene porous adsorbent, HCP(St-DVB-VMZ), using imidazole modified low crosslinked polystyrene microspheres, P(St-DVB-VMZ), as precursor, followed by Friedel crafts alkylation reaction with small-molecule external cross-linking agent. The chemical structure and micro-pore structure of the adsorbent were characterized by Fourier transform infrared spectroscopy(FTIR), X-ray photoelectron spectroscopy(XPS), scanning electron microscopy(SEM) and N₂ adsorption-desorption analysis. The results demonstrated that HCP(St-DVB-VMZ) had abundant microporous structure, and the specific surface area was up to 709 m²/g. Adsorption experiments showed that the as-fabricated HCP(St-DVB-VMZ) exhibited good removal capacity for both the PBUTs(IS, PCS and IAA) and the middle molecular toxins(PTH, #2M and IL-6). The hemocompatibility assays indicated that the HCP(St-DVB-VMZ) possessed good in vitro hemocompatibility, making it suitable for contacting with blood as a hemoperfusion adsorbent for clinical application. © 2021, Editorial Department of Chem. J. Chinese Universities. All right reserved.

Number of references: 34

Main heading: Fourier transform infrared spectroscopy

Controlled terms: Aromatic compounds - Chemical analysis - Crosslinking - Polystyrenes - Pore structure - Proteins - Scanning electron microscopy - Synthesis (chemical) - Toxic materials - X ray photoelectron spectroscopy

Uncontrolled terms: Adsorption experiment - Chronic kidney disease - Crosslinked polystyrene microspheres - Friedel-Crafts alkylation reaction - Hypercrosslinked polystyrene - Micro-pore structures - Micro-porous structure - Removal efficiencies

Classification code: 801 Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 931.2 Physical Properties of Gases, Liquids and Solids

Numerical data indexing: Specific_Surface_Area 7.09e+05m²/kg

DOI: 10.7503/cjcu20200879

Funding Details: Number: 2020J05152, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province;

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Funding text: Supported by the Natural Science Foundation of Fujian Province, China(Nos.2020J05152 and 2020J05153), the Quanzhou Technology Plan Project, China(No.2019C105) and the Ph.D. Research Start-up Fund of Quanzhou Normal University, China.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

109. Fabrication of a novel nitrogen-containing porous carbon adsorbent for protein-bound uremic toxins removal

Accession number: 20210509869699

Authors: Liu, Yunhong (1); Peng, Xinyan (1); Hu, Zhudong (2); Yu, Mingguang (2); Fu, Jijun (3); Huang, Yugang (3)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China; (2) School of Materials Science and Energy Engineering, Foshan University, Foshan; 528000, China; (3) School of Pharmaceutical Sciences, Guangzhou Medical University, Guangzhou; 511436, China

Corresponding author: Peng, Xinyan(pengxy1055@163.com)

Source title: Materials Science and Engineering C

Abbreviated source title: Mater. Sci. Eng. C

Volume: 121

Issue date: February 2021

Publication year: 2021

Article number: 111879

Language: English

ISSN: 09284931

E-ISSN: 18730191

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Protein-bound uremic toxins (PBUTs), the presence of which in the blood is an important risk factor for the progression of chronic kidney disease (CKD), have not been cleared efficiently via traditional hemodialysis methods until now. In this study, biosafe and efficient nitrogen-containing porous carbon adsorbent (NPCA) beads for the clearance of PBUTs were prepared from porous acrylonitrile/divinylbenzene cross-linked copolymer beads followed by pyrolysis. The resulting NPCA beads were characterized via SEM, XPS and nitrogen adsorption/desorption tests. The results demonstrated that the NPCA beads possessed a mesoporous/microporous hierarchical structure with rich nitrogen functional groups on their surfaces and realized efficient PBUTs adsorption in human plasma. More importantly, the efficacy of PBUTs removal was substantially higher than those of commercial adsorbents that are commonly used in clinical uremia treatments. The NPCA beads also exhibited satisfactory removal efficacy towards middle-molecular-weight uremic toxins. The PBUTs removal mechanism of the NPCA beads is ascribed to effective competition between nitrogen-containing NPCA and proteins for PBUT binding. According to hemocompatibility assays, the NPCA beads possessed satisfactory in vitro hemocompatibility. This nitrogen-containing porous carbon adsorbent is an attractive and promising material for blood purification applications in the treatment of clinical uremia. © 2021 Elsevier B.V.

Number of references: 51

Main heading: Nitrogen removal

Controlled terms: Blood - Carbon - Gas adsorption - Nitrogen - Nitrogen plasma - Porous materials - Proteins - Toxic materials

Uncontrolled terms: Blood purification - Carbon adsorbents - Chronic kidney disease - Hemocompatibility - Hierarchical structures - Nitrogen adsorption - Nitrogen functional groups - Removal mechanism

Classification code: 461.2 Biological Materials and Tissue Engineering - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.1 Organic Compounds - 932.3 Plasma Physics - 951 Materials Science

DOI: 10.1016/j.msec.2021.111879

Funding Details: Number: 2020J05152, 2020J05153, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: -, Acronym: FOSU, Sponsor: Foshan University; Number: -, Acronym: QNU, Sponsor: Quanzhou Normal University;

Funding text: This work was financially supported by the Natural Science Foundation of Fujian Province, China (Grant No. 2020J05152 and 2020J05153), the Ph.D. Research Start-up Fund Project of Quanzhou Normal University and the High-Level Talent Start-Up Research Project of Foshan University. We gratefully acknowledge Jafron Company and Sichuan University for providing a performance evaluation system for the adsorbent, which included toxins adsorption tests and blood compatibility evaluations. This work was financially supported by the Natural Science Foundation of Fujian Province, China (Grant No. 2020J05152 and 2020J05153), the Ph.D. Research Start-up Fund Project of Quanzhou Normal University and the High-Level Talent Start-Up Research Project of Foshan University. We gratefully acknowledge Jafron Company and Sichuan University for providing a performance evaluation system for the adsorbent, which included toxins adsorption tests and blood compatibility evaluations.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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110. Highly flexible and conductive nanoporous Ag as good substrate for flexible hybrid supercapacitors

Accession number: 20204009256879

Authors: Wang, Chaoyang (1); Zhu, Shengli (1, 2, 4); Liang, Yanqin (1); Cui, Zhenduo (1); Wu, Shuilin (1); Qin, Chunling (3); Luo, Shuiyuan (4); Inoue, Akihisa (1, 5)

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Source title: Journal of Alloys and Compounds

Abbreviated source title: J Alloys Compd

Volume: 854

Issue date: 15 February 2021

Publication year: 2021

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CODEN: JALCEU

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: Flexible electrode materials with high volumetric capacitance are promising to applications in portable and wearable capacitive storage devices. Here, we utilized the highly flexible and conductive NP-Ag substrate to successfully develop a flexible nanoporous Ag@Co(OH)₂ (NP-Ag@Co(OH)₂) thin film electrode. After 100 multiple bending cycles, the NP-Ag@Co(OH)₂ electrode can keep the original nanostructures and flexibility. The flexible NP-Ag@Co(OH)₂ electrode exhibits the high volumetric capacitance of 929 F cm⁻³ at a current density of 2 A cm⁻³, which is higher than many reported supercapacitor electrodes. The flexible NP-Ag@Co(OH)₂ electrode exhibits good supercapacitor performance even under the bending state. Moreover, the as-assembled NP-Ag@Co(OH)₂ symmetric supercapacitor device has high energy density of 20.07 mWh cm⁻³ at power density of 0.85 W cm⁻³. The device supercapacitor retains 75% capacitance of the initial value at 2 A cm⁻³ after 2000 cycles. This work provides an insight into the rational design of the highly flexible, high-performance supercapacitor electrodes with the potential application in portable or wearable energy storage devices. © 2020 Elsevier B.V.

Number of references: 67

Main heading: Supercapacitor

Controlled terms: Capacitance - Electrodes - Energy storage - Silver - Silver compounds - Wearable technology

Uncontrolled terms: Capacitive storage - Flexible electrodes - High energy densities - Hybrid supercapacitors - Power densities - Supercapacitor electrodes - Thin-film electrode - Volumetric capacitance

Classification code: 525.7 Energy Storage - 547.1 Precious Metals - 701.1 Electricity: Basic Concepts and Phenomena

Numerical data indexing: Percentage 7.50e+01%

DOI: 10.1016/j.jallcom.2020.157095

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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111. A multi-band and polarization-independent perfect absorber based on Dirac semimetals circles and semi-ellipses array

Accession number: 20214110998893

Authors: Li, Zhiyou (1); Yi, Yingting (3); Xu, Danyang (4); Yang, Hua (2); Yi, Zao (1); Chen, Xifang (1); Yi, Yougen (3); Zhang, Jianguo (5); Wu, Pinghui (6)

Author affiliation: (1) Joint Laboratory for Extreme Conditions Matter Properties, Southwest University of Science and Technology, Mianyang; 621010, China; (2) State Key Laboratory of Advanced Processing and Recycling of Non-ferrous Metals, Lanzhou University of Technology, Lanzhou; 730050, China; (3) College of Physics and Electronics, Central South University, Changsha; 410083, China; (4) College of Science, Zhejiang University of Technology, Hangzhou; 310023, China; (5) Department of Physics and Electronic Engineering, Jinzhong University, Jinzhong; 030619, China; (6) Research Center for Photonic Technology, Key Laboratory of Information Functional Material for Fujian Higher Education, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Yi, Zao(yizaomy@swust.edu.cn); Wu, Pinghui(wph1021@163.com)

Source title: Chinese Physics B

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Volume: 30

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Publication year: 2021

Article number: 098102

Language: English

ISSN: 16741056

E-ISSN: 20583834

Document type: Journal article (JA)

Publisher: IOP Publishing Ltd

Abstract: We design a four-band terahertz metamaterial absorber that relied on the block Dirac semi-metal (BDS). It is composed of a Dirac material layer, a gold reflecting layer, and a photonic crystal slab (PCS) medium layer. This structure achieved perfect absorption of over 97% at 4.06 THz, 6.15 THz, and 8.16 THz. The high absorption can be explained by the localized surface plasmon resonance (LSPR). And this conclusion can be proved by the detailed design of the surface structure. Moreover, the resonant frequency of the device can be dynamically tuned by changing the Fermi energy of the BDS. Due to the advantages such as high absorption, adjustable resonance, and anti-interference of incident angle and polarization mode, the Dirac semi-metal perfect absorber (DSPA) has great potential value in fields such as biochemical sensing, information communication, and nondestructive detection. © 2021 Chinese Physical Society.

Number of references: 29

Main heading: Metamaterials

Controlled terms: Natural frequencies - Polarization - Surface plasmon resonance - Surface structure

Uncontrolled terms: Block dirac semi-metal - Localized surface plasmon resonance - Metamaterial absorbers - Multi band - Multi-polarization - Perfect absorber - Polarization independent - Semi-ellipse - Semi-metals - Tera Hertz

Classification code: 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science

Numerical data indexing: Frequency 4.06E+12Hz, Frequency 6.15E+12Hz, Frequency 8.16E+12Hz, Percentage 9.70E+01%

DOI: 10.1088/1674-1056/abea8e

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

112. Enhanced degradation of aqueous tetracycline hydrochloride by integrating eggshell-derived CaCO₃/CuS nanocomposite with advanced oxidation process

Accession number: 20210209751485

Authors: Gao, Xu (1, 2, 3); Chen, Yaqin (3); Kang, Zewen (3); Wang, Bo (2); Sun, Liqin (1); Yang, Da-Peng (3); Du, Wenxiao (1)

Author affiliation: (1) College of Life Science, Yantai University, Yantai; Shandong Province; 264005, China; (2) College of Environment and Materials Engineering, Yantai University, Yantai; Shandong Province; 264003, China; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; Fujian Province; 362000, China

Corresponding author: Yang, Da-Peng(yangdp@qztc.edu.cn)

Source title: Molecular Catalysis

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Article number: 111380

Language: English

ISSN: 24688231

CODEN: MCOADH

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Persulfate (PS)-based advanced oxidation process (AOP) has attracted wide attention in recent years, in which it is crucial to develop a cost-effective and environmentally friendly catalyst. Herein, a waste eggshell derived eggshell/CuS (ES-CuS) composite catalyst was successfully prepared in a simple way, and used in combination with PS to degrade tetracycline hydrochloride (TCH). Our results showed that the coated CuS had a sheet-like structure

and was evenly distributed on the surface of the eggshell, which could effectively prevent agglomeration and enhance catalytic performance. Electron spin resonance (ESR) and free radical capturing experiments confirmed that a series of active species such as sulfate radicals (SO_4^-), hydroxyl radicals (OH^\cdot), as well as carbonate radicals (CO_3^-) were produced during the catalysis process, which is the main reason for enhanced catalytic effect compared with that of the pure CuS. A possible degradation pathway was proposed. It can be expected that discarded eggshells can be used as a low-cost carrier for the synthesis of various composites to achieve its valorization, which have very broad development prospects in the field of environmental remediation or catalysis. © 2020 Elsevier B.V.

Number of references: 51

Main heading: Copper compounds

Controlled terms: Calcite - Calcium carbonate - Catalysis - Catalysts - Civil aviation - Cost effectiveness -

Electron spin resonance spectroscopy - Free radicals - Magnetic moments - Sulfide minerals - Sulfur compounds

Uncontrolled terms: Advanced oxidation process - Advanced Oxidation Processes - Catalytic performance -

Degradation pathways - Development prospects - Environmental remediation - Sheet-like structure - Tetracycline hydrochloride

Classification code: 431.1 Air Transportation, General - 482.2 Minerals - 701.2 Magnetism: Basic Concepts and Phenomena - 801 Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 911.2 Industrial Economics

DOI: 10.1016/j.mcat.2020.111380

Funding Details: Number: 2019H0023, Acronym: -, Sponsor: Fujian Provincial Department of Science and Technology; Number: SDAIT-26-03, Acronym: -, Sponsor: Earmarked Fund for Modern Agro-industry Technology Research System; Number: 2017G023, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: This work was supported by the Orientative project funded by Fujian Provincial Science and Technology Department (2019H0023), Quanzhou City Science & Technology Program of China (2017G023), the earmarked fund for Modern Agroindustry Technology Research System in Shandong Province (SDAIT-26-03).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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113. A fuzzy-decomposition grey modeling procedure for management decision analysis ([Open Access](#))

Accession number: 20210909993018

Authors: Guo, Jianhong (1, 2); Chang, Che-Jung (1, 2); Huang, Yingyi (1, 2); Yu, Kun-Peng (1, 2)

Author affiliation: (1) TSL Business School, Quanzhou Normal University, No. 398, Donghai Street, Quanzhou, Fujian; 362000, China; (2) Fujian University Engineering Research Center of Cloud Computing, Internet of Things and E-Commerce Intelligence, No. 398, Donghai Street, Quanzhou, Fujian; 362000, China

Corresponding author: Chang, Che-Jung(r3795102@ncku alumni.org.tw)

Source title: Mathematical Problems in Engineering

Abbreviated source title: Math. Probl. Eng.

Volume: 2021

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Publication year: 2021

Article number: 6670196

Language: English

ISSN: 1024123X

E-ISSN: 15635147

Document type: Journal article (JA)

Publisher: Hindawi Limited

Abstract: To cope with the increasingly fierce market competition environment, enterprises need to quickly respond to business issues and maintain business advantages, which require timely and correct decisions. In this context, the general mathematical modeling method may cause overfitting phenomenon when using small data sets, so it is difficult to ensure good analysis performance. Therefore, it is significant for enterprises to use limited samples to analyze and forecast. Over the past few decades, the grey model and its extensions have been shown to be effective tools for processing small data sets. To further enforce the effectiveness of data uncertainty processing, a fuzzy-decomposition modeling procedure for grey models is developed. Specifically, Latent Information (LI) function is employed to decompose the initial series into three subseries; next, the three subseries are used to build three grey models and create the estimated values of the three subseries; finally, the weighted average method is applying to combine the estimated values of the three subseries into a single final predicted value. After the actual test on the monthly demand data of the thin-film transistor liquid crystal display panels, the proposed fuzzy-decomposition modeling procedure can

result in good prediction outcomes and is thus an appropriate decision analysis tool for managers. Copyright © 2021 Jianhong Guo et al.

Number of references: 35

Main heading: Uncertainty analysis

Controlled terms: Competition - Data handling - Decision making - Estimation - Liquid crystal displays - Liquid crystals - Thin film transistors

Uncontrolled terms: Data uncertainty - Decision analysis tool - Decomposition model - Latent information - Management decisions - Market competition - Thin film transistor liquid crystal displays - Weighted average method

Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 723.2 Data Processing and Image Processing - 911.2 Industrial Economics - 912.2 Management - 921 Mathematics - 922.1 Probability Theory

DOI: 10.1155/2021/6670196

Funding Details: Number: FJ2019B099, Acronym: -, Sponsor: -; Number: 2017J051165, Acronym: -, Sponsor: -; Number: 17YJC630204, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: LY19G010002, Acronym: ZJNSF, Sponsor: Natural Science Foundation of Zhejiang Province; Number: 20BGL003, Acronym: NPOPSS, Sponsor: National Office for Philosophy and Social Sciences;

Funding text: This research was supported by the Fujian Provincial Social Science Planning Project of China under Grant no. FJ2019B099, Zhejiang Provincial Natural Science Foundation of China under Grant no. LY19G010002, Qianjiang Talent Program of Zhejiang Province (China), National Social Science Foundation of China under Grant no. 20BGL003, Natural Science Foundation of Fujian Province for Youths of China under Grant no. 2017J051165, and Humanistic and Social Science Youth Foundation of the Ministry of Education of China under Grant no. 17YJC630204.

Compendex references: YES

Open Access type(s): All Open Access, Gold, Green

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

114. Management of medical and health big data based on integrated learning-based health care system: A review and comparative analysis

Accession number: 20213210730677

Authors: Ye, Yuguang (1, 2, 3); Shi, Jianshe (4); Zhu, Daxin (1, 2, 3); Su, Lianta (1, 3); Huang, Jianlong (1, 2, 3); Huang, Yifeng (5)

Author affiliation: (1) Faculty of Mathematics and Computer Science, Quanzhou Normal University, Quanzhou; 362000, China; (2) Fujian Provincial Key Laboratory of Data Intensive Computing, Quanzhou; 362000, China; (3) Key Laboratory of Intelligent Computing and Information Processing, Fujian Province University, Quanzhou; 362000, China; (4) Department of General Surgery, Huaqiao University Affiliated Strait Hospital, Quanzhou; Fujian; 362000, China; (5) Department of Diagnostic Radiology, Huaqiao University Affiliated Strait Hospital, Quanzhou; Fujian; 362000, China

Corresponding author: Huang, Jianlong(robotics@qztc.edu.cn)

Source title: Computer Methods and Programs in Biomedicine

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Article number: 106293

Language: English

ISSN: 01692607

E-ISSN: 18727565

CODEN: CMPBEK

Document type: Journal article (JA)

Publisher: Elsevier Ireland Ltd

Abstract: Purpose: We present a Health Care System (HCS) based on integrated learning to achieve high-efficiency and high-precision integration of medical and health big data, and compared it with an internet-based integrated system. Method: The method proposed in this paper adopts the Bagging integrated learning method and the Extreme Learning Machine (ELM) prediction model to obtain a high-precision strong learning model. In order to verify the integration efficiency of the system, we compare it with the Internet-based health big data integration system in terms of integration volume, integration efficiency, and storage space capacity. Results: The HCS based on integrated learning relies on the Internet in terms of integration volume, integration efficiency, and storage space capacity. The amount of integration is proportional to the time and the integration time is between 170-450 ms, which is only half of the comparison system; whereby the storage space capacity reaches 8.3×28TB. Conclusion: The experimental results

show that the integrated learning-based HCS integrates medical and health big data with high integration volume and integration efficiency, and has high space storage capacity and concurrent data processing performance. © 2021

Number of references: 26

Main heading: Health care

Controlled terms: Big data - Data integration - Digital storage - Efficiency - Information management - Learning systems - Systems analysis

Uncontrolled terms: Elaboration likelihood machine - Healthcare systems - High-precision - Integrated learning - Internet based - Internet of medical thing - Medical big data - Space capacity - Storage spaces - Volume integrations

Classification code: 461.7 Health Care - 722.1 Data Storage, Equipment and Techniques - 723.2 Data Processing and Image Processing - 912.3 Operations Research - 913.1 Production Engineering - 961 Systems Science

Numerical data indexing: Time 1.70E-01s to 4.50E-01s

DOI: 10.1016/j.cmpb.2021.106293

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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115. Validation of the promotion mechanism between bromide and UDMH to form NDMA during ozonation

Accession number: 20212510535316

Authors: Gao, Menglan (1); Jiang, Zhibin (1); Liao, Xiaobin (1); Bai, Xingji (1); Qi, Huan (2); Zou, Jing (1); Cao, Wei (1)

Author affiliation: (1) Institute of Municipal and Environmental Engineering, College of Civil Engineering, Huaqiao University, Fujian; 361021, China; (2) College of Textiles and Apparel, Quanzhou Normal University, Fujian; 362002, China

Corresponding authors: Liao, Xiaobin(liaoxb@hqu.edu.cn); Qi, Huan(qh123@126.com)

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Abbreviated source title: Sci. Total Environ.

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Publication year: 2021

Article number: 148316

Language: English

ISSN: 00489697

E-ISSN: 18791026

CODEN: STEVA8

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Unsymmetrical dimethylhydrazine (UDMH) is found to generate substantial carcinogenic nitroso-dimethylamine (NDMA) during ozonation, moreover, its formation is promoted by ubiquitous bromide ions (Br⁻) in water matrixes, but the mechanism is still unclear. In this study, effects of Br⁻ on NDMA formation during ozonation of UDMH were studied, meanwhile, its promotion pathways were also determined. The results demonstrated that Br⁻ promoted NDMA formation from UDMH during ozonation, the formation rate constant with Br⁻ is over 7 times of that without Br⁻. NDMA amount raised from 142.5 to 327.5 µg/L when Br⁻ dosages increased from 0 to 100 µM. No matter with or without Br⁻, the augment of O₃ dosages facilitated NDMA formation; the maximum value was achieved at pH 8. NDMA decreased dramatically from 173.8 to 123.5 µg/L with HCO₃⁻ raising from 0 to 160 µM, while increasing remarkably to 222.5 µg/L with SO₄²⁻ dosing. In addition, NOM inhibited NDMA formation from UDMH during ozonation. The mass spectrum of LC-MS/MS verified that the generation of Br-UDMH was main cause for promoting NDMA formation. Moreover, hypobromous acid (HBrO) was confirmed to be responsible for Br-UDMH formation. In addition, the position that oxidants and Br⁻ attacked was demonstrated based on Gaussian calculation. The results of this study could provide theoretical basis for the application of ozonation in bromine-containing water matrixes. © 2021 Elsevier B.V.

Number of references: 34

Main heading: Ozone

Controlled terms: Mass spectrometry - Ozone water treatment - Ozonization - Rate constants

Uncontrolled terms: Bromide - Bromide ions - Carcinogenics - Dimethylamines - Dimethylhydrazine - Hydroxyl radicals - Nitroso - Nitroso-dimethylamine - Unsymmetrical dimethylhydrazine - Water matrices

Classification code: 445.1 Water Treatment Techniques - 801 Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally

Numerical data indexing: Mass density 1.425E-04kg/m³ to 3.275E-04kg/m³, Mass density 1.738E-04kg/m³ to 1.235E-04kg/m³, Mass density 2.225E-04kg/m³, Size 0.00E00m to 1.00E-04m, Size 0.00E00m to 1.60E-04m

DOI: 10.1016/j.scitotenv.2021.148316

Funding Details: Number: -, Acronym: HQU, Sponsor: Huaqiao University; Number: 201908350069, Acronym: CSC, Sponsor: China Scholarship Council; Number: 51878301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This work was financially supported by National Natural Science Foundation of China (No. 51878301), Key Projects of Quanzhou Science and Technology Plan (No. 2018Z004; No. 2018Z005). In addition, we also need to acknowledge the support of China Scholarship Council (CSC, 201908350069) and the subsidized Project for Postgraduates' Innovative Fund in Scientific Research of Huaqiao University.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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116. Study on dyeing of vegetable tanned leather with indigo (Open Access)

Accession number: 20211110081697

Authors: Jing, Li (1); Taisheng, Gong (2); Haiyan, Xu (1); Yangyi, Chen (1); Shaoqing, Huang (1); Huafeng, Zhong (1)

Author affiliation: (1) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; 362000, China; (2) National Demonstration Center for Experimental Light Chemistry Engineering Education, Shaanxi University of Science and Technology, Xi'an; 710021, China

Source title: Journal of Physics: Conference Series

Abbreviated source title: J. Phys. Conf. Ser.

Volume: 1790

Part number: 1 of 1

Issue: 1

Issue title: 2020 Sustainability Innovation and Fashion Technology International Conference

Issue date: February 22, 2021

Publication year: 2021

Article number: 012003

Language: English

ISSN: 17426588

E-ISSN: 17426596

Document type: Conference article (CA)

Conference name: 2020 Sustainability Innovation and Fashion Technology International Conference, SIFTIC 2020

Conference date: October 15, 2020 - October 17, 2020

Conference location: Shanghai, Virtual, China

Conference code: 167637

Publisher: IOP Publishing Ltd

Abstract: In order to improve the dyeing fastness of indigo plant dyes for leather, save the cost of dyeing and reduce the environmental pollution in the dyeing process, the appearance quality is improved by improving the traditional indigo dyeing method. In this study, we try to use indigo acid environment to dye vegetable tanned leather to avoid the damage of basic environment to leather in the process of indigo vat dyeing. The single factor and orthogonal experiments of indigo natural dye dyeing vegetable tanned leather were carried out with the amount of iron medium, indigo dye, dyeing temperature and pre mordant dyeing time as experimental parameters, and the dyeing effect was evaluated with the K/S levels and color fastness as measurement indexes. The results showed that the concentration of iron powder was 10g / L, the pre mordant dyeing time was 25 minutes, the concentration of indigo was 16 g / L, and the dyeing temperature was 35 °C; the vegetable tanned leather after dyeing had better K/S levels, dry wet friction and tensile strength, but the light fastness needs to be further improved. © Published under licence by IOP Publishing Ltd.

Number of references: 8

Main heading: Dyeing

Controlled terms: Color fastness - Leather - Sustainable development - Tanning - Tensile strength - Vat dyes - Vegetables

Uncontrolled terms: Acid environment - Appearance qualities - Dyeing fastness - Dyeing temperature - Environmental pollutions - Experimental parameters - Orthogonal experiment - Pre-mordant dyeings

Classification code: 803 Chemical Agents and Basic Industrial Chemicals - 814.1 Leather - 814.2 Tanning - 821.4 Agricultural Products

Numerical data indexing: Mass_Density 1.00e+01kg/m3, Mass_Density 1.60e+01kg/m3, Time 1.50e+03s

DOI: 10.1088/1742-6596/1790/1/012003

Funding text: Foundation item: Education Research Project of Fujian Province, China (Nos. JT1808378) Provincial undergraduate education reform project (FBJG20190013) Author brief: LiJing(1981-)female, master's degree, majored in clothing and clothing design, leather product design.

Compendex references: YES

Open Access type(s): All Open Access, Bronze

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

117. Identification of Specific Spoilage Organism in Ready-to-eat Abalone and Studies on Its Spoilage Potential

Accession number: 20213310761621

Title of translation:

Authors: Zheng, Ruisheng (1, 2); Zou, Juqin (1); Jin, Xingjue (1); Li, Lu (1, 3); Wang, Danni (1, 3); Su, Kunlun (3); Lin, Songding (3)

Author affiliation: (1) Quanzhou Normal University, Fujian Province Key Lab for the Development of Bioactive Material from Marine Algae, Quanzhou; 362002, China; (2) Ankee Foodstuff Co. Ltd., Quanzhou; 362000, China; (3) Fujian Zhenggang Food Co. Ltd., Quanzhou; 362013, China

Source title: Journal of Chinese Institute of Food Science and Technology

Abbreviated source title: J. Chin. Inst. Food Sci. Technol.

Volume: 21

Issue: 7

Issue date: July 31, 2021

Publication year: 2021

Pages: 307-312

Language: Chinese

ISSN: 10097848

Document type: Journal article (JA)

Publisher: Chinese Institute of Food Science and Technology

Abstract: To study the specific spoilage organism (SSO) of vacuum-packed ready-to-eat (RTE) abalone and its spoilage potential. According to the results of previous studies, the selective medium was used to isolate and purify SSO from RTE abalone. Identification of SSO in RTE abalone was done by 16S rDNA technology combined with bacterial biochemical identification methods. Inoculated specific spoilage bacteria into RTE abalones, compared them with natural spoilage abalones, analyzed the changes in the drip loss rate, TVB-N, pH value, total number of colonies, PPO and other physical, chemical and sensory indexes of RTE abalones, and discussed the spoilage causes of melanosis, drip loss, softening, rancidity, etc. The results showed that the SSO of the RTE abalone was *Bacillus cereus*. The spoilage characteristics of RTE abalone inoculated with *Bacillus cereus* were more obvious. The degradation rate of drip loss, TVB-N, pH value, total number of colonies, PPO and sensory index were far beyond the natural spoilage of abalone. This shows that the presence of *Bacillus cereus* will accelerate the deterioration of RTE abalone, and greatly shorten the storage time of RTE abalone. It is necessary to take appropriate sterilization measures against *Bacillus cereus*. © 2021, Editorial Office of Journal of CIFST. All right reserved.

Number of references: 19

Main heading: Spoilage

Controlled terms: *Bacillus cereus* - Bacteriology - Chemical analysis - Degradation - Deterioration - pH - Shellfish

Uncontrolled terms: Degradation rate - Drip loss - Identification method - Natural spoilage - Ready-to-eat - Selective medium - Specific spoilage organisms - Storage time

Classification code: 461.9 Biology - 801.1 Chemistry, General - 802.2 Chemical Reactions - 951 Materials Science

DOI: 10.16429/j.1009-7848.2021.07.037

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

118. Using phosphorus-doped molybdenum sulfide with (1 0 0)-facet-exposed and enlarged interlayer spacing to enhance hydrogen evolution

Accession number: 20213110711054

Authors: Niu, Chunxia (1); Mu, Yuewen (1); Song, Hua (2); Chang, Yunzhen (1); Hou, Wenjing (1); Zhao, Yun (1); Han, Gaoyi (1); Xiao, Yaoming (3)

Author affiliation: (1) Institute of Molecular Science, Key Laboratory of Materials for Energy Conversion and Storage of Shanxi Province, Key Laboratory of Chemical Biology and Molecular Engineering of Education Ministry, Shanxi University, Taiyuan; 030006, China; (2) School of Foreign Languages, Shanxi University, Taiyuan; 030006, China; (3) College of Chemical Engineering and Materials, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Mu, Yuewen

Source title: Journal of Electroanalytical Chemistry

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Volume: 897

Issue date: September 15, 2021

Publication year: 2021

Article number: 115545

Language: English

ISSN: 15726657

CODEN: JECHES

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: As a kind of clean energy, production of hydrogen by electrolyzing water has attracted a lot of research interests. Designing highly efficient and stable non-precious metal catalytic electrodes is the key problem for large-scale utilization of hydrogen. Here, phosphorus-doped MoS₂ with few-layered structure is prepared by directly solvothermally treating (NH₄)₂MoS₄ in the presence of hydrazine and sodium hypophosphite. It is found that the obtained few-layered MoS₂ has been doped with phosphorus. The optimal phosphorus-doped MoS₂ exhibits substantially lower overpotentials of 160 mV to drive the hydrogen evolution reaction at current density of 10 mA cm⁻² without iR correction and small Tafel slope of 59 mV dec⁻¹ compared with the un-doped MoS₂, which is inferior to the performance of commercial platinum carbon. Furthermore, the P-doped MoS₂ nanosheets show excellent stability of hydrogen evolution by electrolysis of water in acidic medium. The density functional calculations have elucidated that the incorporation of phosphorus atoms can significantly improve the electrical conductivity and decrease the H adsorption energy barrier on MoS₂ sheet. The few-layered P-doped MoS₂ may be developed as promising candidates towards hydrogen generation for practical applications. © 2021 Elsevier B.V.

Number of references: 49

Main heading: Sulfur compounds

Controlled terms: Hydrogen production - Layered semiconductors - Molybdenum compounds - Nitrogen compounds

Uncontrolled terms: Ammonium tetrathiomolybdates - Clean energy - Energy productions - Enlarged interlayer spacing - Hydrogen-evolution - Interlayer spacings - Molybdenum sulfide - MoS₂ - P-doped molybdenum sulphide - Phosphorus-doped

Classification code: 522 Gas Fuels - 712.1 Semiconducting Materials

Numerical data indexing: Electric current 1.00E-02A, Size 1.016E-01m, Voltage 1.60E-01V, Voltage 5.90E-02V

DOI: 10.1016/j.jelechem.2021.115545

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Funding text: The authors thank the National Natural Science Foundation of China (61804091, 21574076, U1510121, 21501113 and 21602127) and Shanxi province (2015021129), the Fund for Shanxi "1331 Project" Key Innovation Team (TD201704) and Engineering Research Center (PT201807).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

119. A comparative dynamic study of seawater pretreatment using experimental and pilot bubble tower (Open Access)

Accession number: 20210909990406

Authors: Zhao, Yingying (1, 2, 3, 4); Jin, Hui (1); Li, Jiale (1); Dou, Guosheng (5); Ji, Zhiyong (2, 3, 4); Liu, Jie (1, 2); Yuan, Junsheng (1, 2, 6); Guo, Xiaofu (1, 2)

Author affiliation: (1) School of Chemical Engineering and Technology, Hebei University of Technology, Tianjin; 300130, China; (2) Hebei Collaborative Innovation Center of Modern Marine Chemical Technology, Tianjin; 300130,

China; (3) National-Local Joint Engineering Laboratory for Energy Conservation in Chemical Process Integration and Resources Utilization, Tianjin; 300130, China; (4) Tianjin Key Laboratory of Chemical Process Safety, Tianjin; 300130, China; (5) Tianjin Hysci Nanometer Materials Co. Ltd, Tianjin; 300270, China; (6) Quanzhou Normal University, Fujian; 362000, China

Corresponding author: Guo, Xiaofu(93867577@qq.com)

Source title: Water Science and Technology

Abbreviated source title: Water Sci. Technol.

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Publication year: 2021

Pages: 803-817

Language: English

ISSN: 02731223

E-ISSN: 19969732

CODEN: WSTED4

Document type: Journal article (JA)

Publisher: IWA Publishing

Abstract: In the previous study, greenhouse gas CO₂ was successfully used as the precipitator to realize its carbonation by calcium ions in seawater with the help of magnesium oxide. In this study, the reaction process was firstly analyzed by a proposed reaction mechanism, and then the dynamic simulation of the gas-liquid-solid system was carried out via kinetic Monte Carlo simulation. Based on the reaction mechanism, the continuous experimental study was realized in a bubble column. The effects of air flow rate, carbon dioxide flow rate and temperature on the effectiveness evaluation indexes of decalcification efficiency, total mass transfer coefficient and carbon sequestration rate were studied. Finally, a bonnet tower with a diameter of 1 m and a height of 8 m was built to carry out the pilot test. In the laboratory experiments, the calcium removal rate reached 94%, the carbon sequestration rate reached 63.6%, and pure micron calcium carbonate products were obtained. The decalcification rate reached 95% in the pilot test, which is consistent with the results of the laboratory experiment. © 2021 The Authors Water Science & Technology |

Number of references: 29

Main heading: Dynamics

Controlled terms: Calcium carbonate - Carbon dioxide - Carbon dioxide process - Greenhouse gases - Magnesia - Mass transfer - Monte Carlo methods - Seawater

Uncontrolled terms: Carbon sequestration - Effectiveness evaluation - Gas-liquid-solid systems - Kinetic monte carlo simulation - Laboratory experiments - Reaction mechanism - Reaction process - Seawater pretreatment

Classification code: 451.1 Air Pollution Sources - 471.4 Seawater, Tides and Waves - 534.2 Foundry Practice - 641.3 Mass Transfer - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 922.2 Mathematical Statistics

Numerical data indexing: Percentage 6.36e+01%, Percentage 9.40e+01%, Percentage 9.50e+01%, Size 1.00e+00m, Size 8.00e+00m

DOI: 10.2166/wst.2020.595

Funding Details: Number: 2017M611142, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: B20202029, Acronym: -, Sponsor: Natural Science Foundation of Hebei Province; Number: 17273101D, Acronym: -, Sponsor: Science and Technology Bureau of Hebei Province; Number: 20JCZDJC00450, Acronym: -, Sponsor: Tianjin Science and Technology Committee; Number: 2019C109, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: The work is supported by the Tianjin Science and Technology Project (20JCZDJC00450), Natural Science Foundation of Hebei Province (B20202029), Chinese Postdoctoral Science Foundation (2017M611142), Science and Technology Project of Hebei Province (17273101D), and Science and Technology Project of Quanzhou (2019C109).

Compendex references: YES

Open Access type(s): All Open Access, Hybrid Gold

Database: Compendex

Data Provider: Engineering Village

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120. A Morphable Ionic Electrode Based on Thermogel for Non-Invasive Hairy Plant Electrophysiology

Accession number: 20211010027329

Authors: Luo, Yifei (1, 2); Li, Wenlong (1); Lin, Qianyu (2); Zhang, Feilong (1); He, Ke (1); Yang, Dapeng (3); Loh, Xian Jun (2); Chen, Xiaodong (1)

Author affiliation: (1) Innovative Center for Flexible Devices (iFLEX), Max Planck – NTU Joint Lab for Artificial Senses School of Materials Science and Engineering, Nanyang Technological University, 50 Nanyang Avenue, Singapore; 639798, Singapore; (2) Institute of Materials Research and Engineering, Agency for Science, Technology and Research (A*STAR), 2 Fusionopolis Way, Innovis, #08-03, Singapore; 138634, Singapore; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; Fujian; 362000, China

Corresponding authors: Chen, Xiaodong(chenxd@ntu.edu.sg); Loh, Xian Jun(lohxj@imre.a-star.edu.sg); Yang, Dapeng(yangdp@qztc.edu.cn)

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Publication year: 2021

Article number: 2007848

Language: English

ISSN: 09359648

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CODEN: ADVMEW

Document type: Journal article (JA)

Publisher: John Wiley and Sons Inc

Abstract: Plant electrophysiology lays the foundation for smart plant interrogation and intervention. However, plant trichomes with hair-like morphologies present topographical features that challenge stable and high-fidelity non-invasive electrophysiology, due to the inadequate dynamic shape adaptability of conventional electrodes. Here, this issue is overcome using a morphable ionic electrode based on a thermogel, which gradually transforms from a viscous liquid to a viscoelastic gel. This transformation enables the morphable electrode to lock into the abrupt hairy surface irregularities and establish a conformal and adhesive interface. It achieves down to one tenth of the impedance and 4–5 times the adhesive strengths of conventional hydrogel electrodes on hairy leaves. As a result of the improved electrical and mechanical robustness, the morphable electrode can record more than one order of magnitude higher signal-to-noise ratio on hairy plants and maintains high-fidelity recording despite plant movements, achieving superior performance to conventional hydrogel electrodes. The reported morphable electrode is a promising tool for hairy plant electrophysiology and may be applied to diversely textured plants for advanced sensing and modulation. © 2021 Wiley-VCH GmbH

Number of references: 52

Main heading: Plants (botany)

Controlled terms: Adhesives - Electrodes - Electrophysiology - Hydrogels - Neurology - Signal to noise ratio - Textures

Uncontrolled terms: Adhesive interfaces - Adhesive strength - Hairy surface - High-fidelity - Mechanical robustness - Thermogel - Topographical features - Viscous liquids

Classification code: 461.1 Biomedical Engineering - 461.6 Medicine and Pharmacology - 716.1 Information Theory and Signal Processing - 804 Chemical Products Generally

DOI: 10.1002/adma.202007848

Funding Details: Number: A18A1b0045, Acronym: A*STAR, Sponsor: Agency for Science, Technology and Research; Number: NRF-NRFI2017-07, Acronym: NRF, Sponsor: National Research Foundation Singapore; Number: MOE2019-T2-2-022, Acronym: MOE, Sponsor: Ministry of Education - Singapore;

Funding text: The authors thank the financial support from the Agency for Science, Technology and Research under its AME Programmatic Funding Scheme (A18A1b0045), the National Research Foundation, Prime Minister's Office, Singapore, under its NRF Investigatorship (NRF-NRFI2017-07), and Singapore Ministry of Education (MOE2019-T2-2-022). The authors appreciate the initial provision of polymers and project advice by Dr. Sing Shy Liow, and suggestions on improving the work from Dr. Liang Pan and Dr. Shaobo Ji.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

121. NAS-WFPN: Neural Architecture Search Weighted Feature Pyramid Networks for Object Detection

Accession number: 20211110091651

Authors: Li, Xiaohan (1); Xie, Ziyang (1); Lai, Taotao (2); Zhao, Fusheng (3); Xu, Haiyin (4); Chen, Riqing (1)

Author affiliation: (1) School of Computer Science, Fujian Agriculture and Forestry University, Fuzhou; 350002, China; (2) School of Computer and Control Engineering, Minjiang University, Fuzhou; 350108, China; (3) School of Mathematics and Computer Science, Quanzhou Normal University, Quanzhou; 362000, China; (4) Department of Information Engineering, Hebei Vocational and Technical College of Building Materials, Qinhuangdao; 066000, China

Corresponding author: Chen, Riqing(Riqing.chen@fafu.edu.cn)

Source title: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)

Abbreviated source title: Lect. Notes Comput. Sci.

Volume: 12383 LNCS

Part number: 2 of 2

Issue title: SpaCCS 2020 International Workshops, 2020, Proceedings

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Language: English

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Document type: Conference article (CA)

Conference name: 13th International Conference on Security, Privacy, and Anonymity in Computation, Communication, and Storage, SpaCCS 2020

Conference date: December 18, 2020 - December 20, 2020

Conference location: Nanjing, China

Conference code: 255019

Publisher: Springer Science and Business Media Deutschland GmbH

Abstract: As we known, most of convolution neural architectures are manually designed. However, they cannot obtain the optimal structures. To address this problem, based on Weighted Feature Pyramid Networks (WFPN), in this paper, we use gaussian kernel to calculate the weight to design a novel method called the Neural Architecture Search Weighted Feature Pyramid Networks (i.e., NAS-WFPN). NAS-WFPN mainly consists of three parts (i.e., top-down pathway, bottom-up pathway and lateral connections) to fuse features across different scales. Experimental results show that NAS-WFPN achieves higher accuracy compared with the existing object detection methods. Specifically, NAS-WFPN increases accuracy by 2.3 AP compared to SSDLite with MobileNetV2 model and gets 49.1 AP, which exceeds NAS-FPN and Mask R-CNN. © 2021, Springer Nature Switzerland AG.

Number of references: 22

Main heading: Object detection

Controlled terms: Architecture - Network architecture - Object recognition - Privacy by design - Structural optimization

Uncontrolled terms: Bottom up - Gaussian kernels - Lateral connections - Neural architectures - Object detection method - Optimal structures - Topdown - Weighted features

Classification code: 402 Buildings and Towers - 723.2 Data Processing and Image Processing - 921.5 Optimization Techniques

DOI: 10.1007/978-3-030-68884-4_32

Funding Details: Number: JAT170477, Acronym: -, Sponsor: -; Number: 61702101,61972093, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: This work was supported in part by the National Natural Science Foundation of China under Grant 61972093, and Grant 61702101, and in part by the Young and Middle-aged Teachers Education and Research Project in Fujian Province under Grant JAT170477.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

122. Mechanical and acoustic emission properties of vegetable fiber-reinforced epoxy composites for percussion instrument drums

Accession number: 20211110077679

Authors: Liu, Fanxizi (1); Wang, Keqin (1); Lang, Chenhong (2); Guan, Fuwang (2); Jiang, Jinhua (1); Qiu, Yiping (1, 2)

Author affiliation: (1) Department of Technical Textiles, College of Textiles, Donghua University, Shanghai, China; (2) Department of Textile Engineering, College of Textiles and Apparel, Quanzhou Normal University, Quanzhou, China

Corresponding author: Qiu, Yiping(yppqiu@dhu.edu.cn)

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Publication year: 2021

Pages: 2864-2871

Language: English

ISSN: 02728397

E-ISSN: 15480569

CODEN: PCOMDI

Document type: Journal article (JA)

Publisher: John Wiley and Sons Inc

Abstract: Percussion instrument drums are traditionally made of wood, which is becoming less available as environmental concerns grow. In order to replace wood in percussion instruments, four types of epoxy resin composites reinforced with fabrics of hemp, flax, ramie, and jute, respectively, are fabricated using vacuum assisted resin infusion molding. The tensile and flexural properties of the composites are measured and compared with those of ailanthus wood. The results show that the flexural strengths and moduli of the composites are either better or in between to those of the horizontal and vertical strips of the wood. An acoustic test method is developed to test the acoustic performance of the composites and the wood. The results show that the composites have lower acoustic dynamic moduli, acoustic radiation damping coefficients, sound velocity, and higher acoustic impedance than those of the wood due to their lower flexural moduli and higher specific densities. The shapes of the acoustic spectra for the composites are somewhat similar to those of ailanthus. The acoustic performance comprehensive scores of the four composites are also in between those of the vertical and the horizontal strips of ailanthus. It is possible to match the acoustic performance of ailanthus by increasing the flexural modulus and decreasing the specific density of the composites through reducing the yarn crimp, increasing the fiber volume fraction, and introducing microvoids into the composites. © 2021 Society of Plastics Engineers.

Number of references: 26

Main heading: Epoxy resins

Controlled terms: Acoustic emission testing - Acoustic impedance - Bending strength - Density (specific gravity) - Hemp - Musical instruments - Wood

Uncontrolled terms: Acoustic performance - Environmental concerns - Epoxy resin composites - Fiber reinforced epoxy composites - Fiber volume fractions - Percussion instruments - Tensile and flexural properties - Vacuum assisted resin infusion moldings

Classification code: 751.2 Acoustic Properties of Materials - 752.4 Acoustic Generators - 811.2 Wood and Wood Products - 815.1.1 Organic Polymers - 821.4 Agricultural Products - 931.2 Physical Properties of Gases, Liquids and Solids

DOI: 10.1002/pc.26020

Funding Details: Number: 2017ZT002, Acronym: -, Sponsor: -; Number: 2019KJ32, H18028, Acronym: -, Sponsor: -; Number: 2019J01740, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: -, Acronym: QNU, Sponsor: Quanzhou Normal University; Number: 2018K002, Acronym: -, Sponsor: Quanzhou City Science and Technology Program;

Funding text: Natural Science Foundation of Fujian Province, Grant/Award Number: 2019J01740; Quanzhou City Science & Technology Program of China, Grant/Award Number: 2018K002; Startup Foundation for Doctors of Quanzhou Normal University, Grant/Award Number: H18028; Transverse Research Project, Grant/Award Number: 2019KJ32; Quanzhou Homebay Recruitment Program of Global Talents, Grant/Award Number: 2017ZT002 Funding information This work was supported by Natural Science Foundation of Fujian Province, China (Grant No. 2019J01740); Quanzhou City Science and Technology Program of China (Grant No. 2018K002); Startup Foundation for Doctors of Quanzhou Normal University (Grant No. H18028); Transverse Research Project (Grant No. 2019KJ32); Quanzhou Homebay Recruitment Program of Global Talents (Grant No. 2017ZT002).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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123. An Asymmetric Silicon Grating Dual-Narrow-Band Perfect Absorber Based on Dielectric-Metal-Dielectric Structure (Open Access)

Accession number: 20213910942748

Authors: Xu, Feng (1); Lin, Lixia (1); Wei, Dongwei (1); Xu, Jing (1); Fang, Jun (1)

Author affiliation: (1) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou, China

Corresponding author: Fang, Jun(fangjun_qztc@163.com)

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Abbreviated source title: Front. Mater.

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Publication year: 2021

Article number: 752745

Language: English

E-ISSN: 22968016

Document type: Journal article (JA)

Publisher: Frontiers Media S.A.

Abstract: With the exhaustion of world energy, new energy has become the most important content of each country's development strategy. How to efficiently use solar energy has become a research hotspot in current scientific research. Based on surface plasmon resonance and Fabry-Perot (FP) cavity, this paper proposes a design method of asymmetric silicon grating absorber, and uses finite difference time domain (FDTD) method for simulation calculation. By adjusting the geometric parameters, the asymmetric silicon grating absorber realizes two narrow-band absorption peaks with absorption greater than 99% in the optical wavelength range of 3,000–5,000 nm, and the absorption peak wavelengths are $\lambda_1 = 3,780$ nm and $\lambda_2 = 4,135$ nm, respectively. When the electromagnetic wave is incident on the surface of the metamaterial, it will excite the plasmon resonance of the metal to form a surface plasmon (SP) wave. When the SP wave propagates along the x axis, the silicon grating can reflect the SP wave back and forth. When the frequency of the SP wave and the incident light are equal, it will cause horizontal FP coupling resonance, resulting in different resonance wavelengths. This paper also discusses the influence of geometric parameters, incident angle and polarization angle on the performance of silicon grating absorbers. Finally, the sensing performance of the structure as a refractive index sensor is studied. The absorber can be used for various spectral applications such as photon detection, optical filtering and spectral sensing. © Copyright © 2021 Xu, Lin, Wei, Xu and Fang.

Number of references: 55

Main heading: Surface plasmon resonance

Controlled terms: Electromagnetic wave polarization - Electromagnetic waves - Fabry-Perot interferometers - Finite difference time domain method - Refractive index - Refractometers - Silicon - Solar energy

Uncontrolled terms: Absorption peaks - Asymmetric silicon grating - Dual-narrow-band - Fabry-Perot resonances - Narrow bands - Perfect absorber - Perfect absorption - Silicon gratings - Surface plasmon waves - Surface-plasmon resonance

Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 657.1 Solar Energy and Phenomena - 711 Electromagnetic Waves - 741.1 Light/Optics - 921 Mathematics - 941.3 Optical Instruments

Numerical data indexing: Percentage 9.90E+01%, Size 3.78E-06m, Size 4.135E-06m, Size 5.00E-06m

DOI: 10.3389/fmats.2021.752745

Compendex references: YES

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

124. Biodegradable hydrogel with thermo-response and hemostatic effect for photothermal enhanced anti-infective therapy

Accession number: 20211810278211

Authors: Cao, Changyu (1); Yang, Nan (1); Zhao, Ye (1); Yang, Dapeng (3); Hu, Yanling (1); Yang, Dongliang (1); Song, Xuejiao (1); Wang, Wenjun (2); Dong, Xiaochen (1, 4)

Author affiliation: (1) Key Laboratory of Flexible Electronics (KLOFE) and Institute of Advanced Materials (IAM), School of Physical and Mathematical Sciences, Nanjing Tech University (NanjingTech), Nanjing; 211800, China; (2) School of Physical Science and Information Technology, Liaocheng University, Liaocheng; 252059, China; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China; (4) School of Chemistry and Materials Science, Nanjing University of Information Science and Technology, Nanjing; 210044, China

Corresponding authors: Yang, Dongliang(yangdl1023@njtech.edu.cn); Dong, Xiaochen(iamxcdong@njtech.edu.cn)

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Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Massive bleeding and infectious complication remain the leading cause of worldwide trauma deaths. To tackle this issue, a platelet-inspired degradable antibacterial hydrogel (Gel/PP-TA-Ag) is synthesized based on gelatin methacrylate (GelMA), tannic acid (TA), polyphosphate (PolyP) and gallic acid functionalized silver nanoparticles (Ag NPs) via a facile photopolymerization process. Accompanied by the degradation of the hydrogel, the released PolyP can activate the coagulation pathway, resulting in a better hemostatic effect than commercial gauze in the mice-bleeding model. Simultaneously, benefiting from hyperthermia originated from Ag NPs and photothermal accelerated release of TA and Ag⁺, 97.57% of methicillin-resistant *Staphylococcus aureus* (MRSA) and 95.99% of *E. coli* are eliminated in vitro. Moreover, in vivo experiments reveal that 91.76% of MRSA in wounds is removed, and the wound healing is effectively improved with more angiogenesis and collagen deposition. The level of inflammation in the wounds is also significantly reduced. As a result, Gel/PP-TA-Ag hydrogel possesses great potential in achieving satisfactory efficacy in infected wound healing. © 2021 Elsevier Ltd

Number of references: 40

Main heading: Hydrogels

Controlled terms: *Escherichia coli* - Mammals - Photopolymerization - Silver nanoparticles - Synthesis (chemical) - Tissue regeneration

Uncontrolled terms: Biodegradable hydrogels - Coagulation pathway - Collagen deposition - Functionalized - In-vivo experiments - Infected wounds - Methicillin-resistant *staphylococcus aureus* - Silver nanoparticles (AgNps)

Classification code: 461.1 Biomedical Engineering - 741.1 Light/Optics - 802.2 Chemical Reactions - 804 Chemical Products Generally

Numerical data indexing: Percentage 9.18e+01%, Percentage 9.60e+01%, Percentage 9.76e+01%

DOI: 10.1016/j.nantod.2021.101165

Funding Details: Number: 61775095, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 61935004, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: BK20200710, Acronym: -, Sponsor: Natural Science Foundation of Jiangsu Province;

Funding text: The work was supported by NNSF (61775095, 61935004), Jiangsu Province Policy Guidance Plan (BZ2019014), Natural Science Foundation of Jiangsu Province (BK20200710), Six talent peak innovation team in Jiangsu Province (TD-SWYY-009), 'Taishan scholars' construction special fund of Shandong Province, and Nanjing Polytechnic Institute startup fund (NHKY-2019-19).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

125. Examining the size-specific photosynthesis-irradiance parameters and relationship with phytoplankton types in a subtropical marginal sea (Open Access)

Accession number: 20213310772247

Authors: Liu, Haoran (1); Xie, Yuyuan (1); Qiu, Yong (1, 2); Wang, Lei (1); Wang, Feipeng (1, 3); Laws, Edward A. (4); Huang, Bangqin (1)

Author affiliation: (1) State Key Laboratory of Marine Environmental Science, Fujian Provincial Key Laboratory of Coastal Ecology and Environmental Studies, College of the Environment and Ecology, Xiamen University, Xiamen; Fujian, China; (2) College of Oceanology and Food Science/Fujian Provincial Key Laboratory for the Development of Bioactive Material from Marine Algae, Quanzhou Normal University, Quanzhou; Fujian, China; (3) Institute of Oceanography, Minjiang University, Fuzhou; Fujian, China; (4) Department of Environmental Sciences, Louisiana State University, Baton Rouge; LA, United States

Corresponding author: Xie, Yuyuan(xieyuyuan@hotmail.com)

Source title: Ecological Indicators

Abbreviated source title: Ecol. Indic.

Volume: 130

Issue date: November 2021**Publication year:** 2021**Article number:** 108094**Language:** English**ISSN:** 1470160X**Document type:** Journal article (JA)**Publisher:** Elsevier B.V.

Abstract: Through photosynthesis, phytoplankton initiate material cycling and the flow of energy through marine ecosystems. The structure of marine ecosystems is sensitive to the size of primary producers, and size-specific photosynthesis-irradiance (P-I) parameters are required for modeling the size-specific primary production. We defined a phytoplankton type to be a group of phytoplankton communities with similar compositions and hypothesized that a function of phytoplankton types might be used to quantify systematic differences of P-I parameters between size classes (structural effects) and variations of the magnitudes of those parameters if the overlap between habitats was small (environmental effects). To test this hypothesis, we conducted a study to measure the size-specific P-I parameters of two size classes (2 μm) and pigment-based phytoplankton community structure in a marginal sea, the Taiwan Strait. Three phytoplankton types were classified, and type-based and size-specific P-I parameters were derived. The results demonstrated the potential of a type-based model to estimate P-I parameters for two phytoplankton size classes as well as different habitats. © 2021

Number of references: 74**Main heading:** Phytoplankton**Controlled terms:** Ecosystems - Photosynthesis - Tropics**Uncontrolled terms:** Flow of energy - Marginal seas - Material cycling - Photosynthesis-irradiance parameter - Phytoplankton community - Phytoplankton size class - Phytoplankton type - Primary production - Size class - Taiwan Straits**Classification code:** 443 Meteorology - 454.3 Ecology and Ecosystems - 461.9 Biology - 471 Marine Science and Oceanography - 741.1 Light/Optics - 802.2 Chemical Reactions**Numerical data indexing:** Size 2.00E-06m**DOI:** 10.1016/j.ecolind.2021.108094

Funding Details: Number: 41776146, 41890803, DY135-E2-5-05, NORC2015-04, NORC2016-04, U1805241, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2016YFA0601201, Acronym: NKRDP, Sponsor: National Key Research and Development Program of China;

Funding text: This work was supported by the National Key R&D Program of China (No. 2016YFA0601201), the National Natural Science Foundation of China (NSFC, Nos. 41776146, U1805241, and 41890803), and Project of Monitoring and Protection of the Ecology and Environment in the East Pacific Ocean (No. DY135-E2-5-05). We thank NSFC Shiptime Sharing Project for supporting the cruises by R/V Yanping 2 (Nos: NORC2015-04 and NORC2016-04). We also thank Lizhen Lin, chief scientists of cruises, captains and crew of RV Yanping 2 for their assistance in our experiments. We also thank Fujian Institute of Oceanography for the hydrographic and nutrient data. This work was supported by the National Key R&D Program of China (No. 2016YFA0601201), the National Natural Science Foundation of China (NSFC, Nos. 41776146, U1805241, and 41890803), and Project of Monitoring and Protection of the Ecology and Environment in the East Pacific Ocean (No. DY135-E2-5-05). We thank NSFC Shiptime Sharing Project for supporting the cruises by R/V Yanping 2 (Nos: NORC2015-04 and NORC2016-04). We also thank Lizhen Lin, chief scientists of cruises, captains and crew of RV Yanping 2 for their assistance in our experiments. We also thank Fujian Institute of Oceanography for the hydrographic and nutrient data.

Compendex references: YES**Open Access type(s):** All Open Access, Gold**Database:** Compendex**Data Provider:** Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

126. Resource allocation and trust computing for blockchain-enabled edge computing system

Accession number: 20211210107234**Authors:** Zhang, Lejun (1, 2); Zou, Yanfei (1); Wang, Weizheng (3); Jin, Zilong (4); Su, Yansen (5); Chen, Huiling (6)

Author affiliation: (1) College of Information Engineering, Yangzhou University, Yangzhou; 225127, China; (2) School Math & Computer Science, Quanzhou Normal University, Quanzhou; 362000, China; (3) Univ Aizu, Aizu Wakamatsu, Fukushima; 9658580, Japan; (4) School of Computer and Software, Nanjing University of Information Science and Technology, Nanjing; 21004, China; (5) Key Laboratory of Intelligent Computing and Signal Processing of Ministry of Education, School of Computer Science and Technology, Anhui University, Hefei; 230601, China; (6) Department of Computer Science and Artificial Intelligence, Wenzhou University, Wenzhou; 325035, China

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Source title: Computers and Security

Abbreviated source title: Comput Secur

Volume: 105

Issue date: June 2021

Publication year: 2021

Article number: 102249

Language: English

ISSN: 01674048

CODEN: CPSEDU

Document type: Journal article (JA)

Publisher: Elsevier Ltd

Abstract: In order to meet various needs of people, different Internet of Things (IoT) devices have been developed and applied successfully in recent years. However, the consequent challenges in terms of search efficiency, reliable requirements, and resource allocation appear followed, which attract attention from both academia and industry. Facing this circumstance, it is necessary to establish a new scheme to realize data processing and sharing better. Therefore, a reliable and efficient system based on edge computing and blockchain is proposed in this paper. First, a new group-agent strategy with trust computing is designed to ensure the reliability of edge devices during interactions and improve transmission efficiency. Second, we introduce a stacked task sorting and ranking mechanism which improves resource allocation in each edge device. Third, this paper creates a new content model that uses Zipf distribution to predict context popularity of keywords and encrypt hot data with symmetric searchable encryption (SSE) technology. Finally, simulation results show that the proposed scheme has better computational efficiency and higher reliability compared with existing methods. © 2021 Elsevier Ltd

Number of references: 29

Main heading: Resource allocation

Controlled terms: Blockchain - Computational efficiency - Cryptography - Edge computing - Efficiency - Internet of things - Trusted computing

Uncontrolled terms: Block-chain - Computing system - Content modeling - Edge computing - Group agents - Ranking mechanisms - Resources allocation - Search efficiency - Transmission efficiency - Trust computing

Classification code: 722.3 Data Communication, Equipment and Techniques - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 723.3 Database Systems - 912.2 Management - 913.1 Production Engineering

DOI: 10.1016/j.cose.2021.102249

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

127. Numerical analysis on formation mechanism of airflow field in rotor spinning unit

Accession number: 20211010029262

Title of translation:

Authors: Shi, Qianqian (1); Wang, Jiang (1); Zhang, Yuze (1); Lin, Huiting (2); Wang, Jun (1, 3)

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Source title: Fangzhi Xuebao/Journal of Textile Research

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Publication year: 2021

Pages: 180-184 and 192

Language: Chinese

ISSN: 02539721

Document type: Journal article (JA)

Publisher: China Textile Engineering Society

Abstract: The airflow field in a rotor spinning unit under a normal working condition is mainly affected by the air suction mechanism and rotor rotation mechanism. In order to investigate the contribution of the two mechanisms to the formation of airflow field in the rotor spinning unit, three cases corresponding to different operating conditions were established for investigation, and the fluid domain in the three cases based on the computational fluid dynamics were numerically simulated. The velocity distribution and air pressure distribution of the airflow field in three cases were also analyzed and discussed. Numerical simulation results show that the airflow field in the rotor spinning unit is determined by the air suction at rotor outlet and the high-speed rotor rotation. The air suction mechanism provides the necessary air velocity and negative pressure environment for fiber's transportation. The rotation mechanism assists in smooth transfer of the fibers to the rotor slide wall, the ordered arrangement of fibers, and the accumulation of the fibers to rotor groove. It is under the joint action of the two mechanisms that a unique spinning environment where fibers are driven using air for rotor spinning is formed. © 2021, Periodical Agency of Journal of Textile Research. All right reserved.

Number of references: 11

Main heading: Spinning (fibers)

Controlled terms: Air - Computational fluid dynamics - Fibers

Uncontrolled terms: Air flow fields - Air-pressure distributions - Different operating conditions - Formation mechanism - High-speed rotors - Negative pressures - Ordered arrangement - Rotation mechanism

Classification code: 723.5 Computer Applications - 804 Chemical Products Generally - 819.3 Fiber Chemistry and Processing

DOI: 10.13475/j.fzxb.20201008705

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

128. Self-supporting amorphous nanoporous NiFeCoP electrocatalyst for efficient overall water splitting

Accession number: 20210609878266

Authors: Pang, Yao (1); Xu, Wence (3); Zhu, Shengli (1, 2, 5); Cui, Zhenduo (1); Liang, Yanqin (1); Li, Zhaoyang (1); Wu, Shuilin (1); Chang, Chuntao (4); Luo, Shuiyuan (5)

Author affiliation: (1) School of Materials Science and Engineering, Tianjin University, Tianjin; 300350, China; (2) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (3) Key Laboratory of Advanced Energy Materials Chemistry (Ministry of Education), College of Chemistry, Nankai University, Tianjin; 300071, China; (4) School of Mechanical Engineering, Dongguan University of Technology, Dongguan; 523808, China; (5) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding authors: Zhu, Shengli(slzhu@tju.edu.cn); Chang, Chuntao(changct@dgut.edu.cn)

Source title: Journal of Materials Science and Technology

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Language: English

ISSN: 10050302

CODEN: JSCTEQ

Document type: Journal article (JA)

Publisher: Chinese Society of Metals

Abstract: The design of cost-effective and earth-abundant bifunctional electrocatalysts for highly efficient oxygen evolution reaction (OER) and hydrogen evolution reaction (HER) is important for water splitting as an advanced renewable energy transformation system. In this work, the self-supporting amorphous NiFeCoP catalyst with nanoporous structure via a facile electrochemical dealloying method is reported. Benefiting from the bicontinuous nanostructure, disordered atomic arrangement, abundant active sites and synergic effect of various transition metals, the as-prepared nanoporous NiFeCoP (np-NiFeCoP) catalyst exhibits good electrocatalytic activity, which

achieves the current densities of 10 mA cm⁻² at low overpotentials of 244 mV and 105 mV for OER and HER in 1.0 M KOH, respectively. In addition, the bifunctional electrocatalyst also shows outstanding and durable electrocatalytic activity in water splitting with a small voltage of 1.62 V to drive a current density of 10 mA cm⁻² in a two-electrode electrolyzer system. The present work would provide a feasible strategy to explore the efficient and low-cost bifunctional electrocatalysts toward overall water splitting. © 2021

Number of references: 55

Main heading: Phosphorus compounds

Controlled terms: Catalyst activity - Cobalt compounds - Cost effectiveness - Dealloying - Electrocatalysts - Hydrogen evolution reaction - Iron compounds - Nickel compounds - Oxygen evolution reaction - Potassium hydroxide - Transition metals

Uncontrolled terms: Amorphous-nanoporous - Atomic arrangement - Bifunctional electrocatalysts - Electrocatalytic activity - Nanoporous structures - Oxygen evolution reaction (oer) - Renewable energies - Synergic effects

Classification code: 531 Metallurgy and Metallography - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 911.2 Industrial Economics

Numerical data indexing: Voltage 1.05e-01V, Voltage 2.44e-01V

DOI: 10.1016/j.jmst.2020.11.020

Funding Details: Number: 51771131, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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129. A Lithium-Metal Anode with Ultra-High Areal Capacity (50 mAh cm⁻²) by Gridding Lithium Plating/Stripping

Accession number: 20211210107148

Authors: Xu, Pan (1); Hu, Xinyu (1); Liu, Xiaoyu (1); Lin, Xiaodong (1); Fan, Xiaoxiang (1); Cui, Xueyang (1); Sun, Cui (1); Wu, Qihui (2); Lian, Xiaobing (3); Yuan, Ruming (1); Zheng, Mingsen (1); Dong, Quanfeng (1)

Author affiliation: (1) Collaborative Innovation Center of Chemistry for Energy Materials, State Key Laboratory of Physical Chemistry of Solid Surfaces, Department of Chemistry, College of Chemistry and Chemical Engineering, Engineering Research Center of Electrochemical Technologies of Ministry of Education, Xiamen University, Xiamen; 361005, China; (2) College of Mechanical and Energy Engineering, Jimei University, Xiamen; Fujian; 361021, China; (3) College of Chemical Engineering and Materials Science, Quanzhou Normal University, Quanzhou Fujian; 362000, China

Corresponding author: Zheng, Mingsen(mszheng@xmu.edu.cn)

Source title: Energy Storage Materials

Abbreviated source title: Energy Storage Mater.

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Language: English

E-ISSN: 24058297

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: Lithium dendrites, "dead lithium", infinite volume change and fragile solid electrolyte interphase (SEI) appear indefinitely during Li plating/stripping process, which severely resist the practical application of lithium metal batteries (LMBs). Herein, by a functionalized framework, a phosphorized copper mesh as support skeleton, the lithium plating/stripping has been gridded into zoning effect, thus a desired lithium anode with excellent performance and practical application significance can be achieved. The framework-based lithium anode showed multi-functions with many advantages: enhancing lithium affinity, mitigating volume expansion, improving the current distributions, and inducing uniform deposition of Li⁺. Thus, a highly reversible and dendrite-free lithium anode under large capacity could be successfully realized, which has been verified by operando optical dynamic test and COMSOL simulation. As expected, symmetric-cell displays low overpotential (~210 mV) at ultra-high current density of 20 mA cm⁻² and long lifespan (>1600 h) at ultra-high areal capacity of 50 mAh cm⁻², moreover, full-cell delivers high cycling stability (2 C, 500 cycles) and outstanding rate performance with a lower polarization. © 2021

Number of references: 60

Main heading: Mesh generation

Controlled terms: Anodes - Lithium - Lithium batteries - Plating - Solid electrolytes

Uncontrolled terms: Functionalized framework - Gridded li plating/stripping - Gridding - Li\$++\$ - Lithium anode - Lithium metal anode - Lithium metal battery - Multi-functions - Phosphorized copper mesh - Ultra-high

Classification code: 539.3 Metal Plating - 542.4 Lithium and Alloys - 549.1 Alkali Metals - 702.1.1 Primary Batteries - 714.1 Electron Tubes - 723.5 Computer Applications - 803 Chemical Agents and Basic Industrial Chemicals - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory

Numerical data indexing: Electric current 2.00E-02A, Time 5.76E+06s, Voltage 2.10E-01V

DOI: 10.1016/j.ensm.2021.03.010

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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130. In situ synthesis of a novel Mn₃O₄/g-C₃N₄ p-n heterostructure photocatalyst for water splitting

Accession number: 20204709504613

Authors: Li, Yuanyuan (1); Zhu, Shengli (1, 2, 4); Kong, Xiangchen (1, 5); Liang, Yanqin (1); Li, Zhaoyang (1); Wu, Shuilin (1); Chang, Chuntao (3); Luo, Shuiyuan (4); Cui, Zhenduo (1)

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Source title: Journal of Colloid and Interface Science

Abbreviated source title: J. Colloid Interface Sci.

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Language: English

ISSN: 00219797

E-ISSN: 10957103

CODEN: JCISA5

Document type: Journal article (JA)

Publisher: Academic Press Inc.

Abstract: Designing high-efficiency photocatalyst for photocatalytic water splitting is a considerable challenge. Herein, a new Mn₃O₄/g-C₃N₄ p-n heterostructure photocatalyst is prepared by an in-situ growth method. The introduction of Mn₃O₄ can enhance light absorption ability of g-C₃N₄. The Mn₃O₄/g-C₃N₄ photocatalyst exhibits outstanding photocatalytic activity for hydrogen evolution reaction (HER) efficiency of ~2700 μmol g⁻¹h⁻¹ at λ > 420 nm. For the separate reactions of H₂ evolution and O₂ evolution under simulated sunlight, the efficiencies of Mn₃O₄/g-C₃N₄ heterostructure photocatalyst are 3300 μmol g⁻¹h⁻¹ and 654 μmol g⁻¹h⁻¹, respectively. The p-n junction is also capable of catalyzing the overall water splitting reaction to generate H₂ and O₂ products in a stoichiometric molar ratio of 2:1. The formation of electric field in p-n Mn₃O₄/g-C₃N₄ junction promotes electron transfer and improves photocatalytic performance. © 2020 Elsevier Inc.

Number of references: 38

Main heading: Manganese oxide

Controlled terms: Efficiency - Electric fields - Electron transport properties - Light absorption - Molar ratio - Photocatalytic activity - Semiconductor junctions

Uncontrolled terms: Absorption abilities - Electron transfer - High-efficiency - In-situ synthesis - Photocatalytic performance - Photocatalytic water splitting - Simulated sunlight - Water splitting reactions

Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 804 Chemical Products Generally - 913.1 Production Engineering

Numerical data indexing: Size 4.20e-07m

DOI: 10.1016/j.jcis.2020.11.002

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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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131. New 3D Porous Silver Nanopolycluster as a Highly Effective Supercapacitor Electrode: Synthesis and Study of the Optical and Electrochemical Properties

Accession number: 20210609876082

Authors: Wu, Qing-Shi (1); Bigdeli, Fahime (2); Rouhani, Farzaneh (2); Gao, Xue-Mei (3); Kaviani, Hamed (2); Li, Hong-Jing (3); Wang, Wei (3); Liu, Kuan-Guan (3); Hu, Mao-Lin (4); Cai, Xiao-Qing (4); Morsali, Ali (2)

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Source title: Inorganic Chemistry

Abbreviated source title: Inorg. Chem.

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Language: English

ISSN: 00201669

E-ISSN: 1520510X

CODEN: INOCAJ

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: A high-nucleus silver nanopolycluster as a new type of silver-based polymer supercapacitor (SSc) by a simple and single-step synthesis process was designed and synthesized. The structural, optical, and electrochemical properties of SSc-2 were determined. This highly stable conductive 3D nanopolycluster shows great cycling stability, large capacity, and high energy density without any modification or doping process and so acts as an excellent SSc (412 F g⁻¹ at 1.5 A g⁻¹). In addition, there was a stable cycling performance (94% capacitance) following 7000 cycles at 3 A g⁻¹ current density. The presence of fluorinated groups, 3D expansion of high-nucleus metallic clusters, and porosity are the advantages of SSc-2 that lead to stability, conductivity, and high capacity, respectively. These results lead to the development of a novel kind of SSc by overcoming the low conductivity and limited capacity challenges without any modification. ©

Number of references: 46

Main heading: Sulfur compounds

Controlled terms: Electrochemical properties - Silver - Supercapacitor

Uncontrolled terms: Cycling stability - High energy densities - Highly stables - Limited capacity - Low conductivity - Metallic clusters - Single-step synthesis - Supercapacitor electrodes

Classification code: 547.1 Precious Metals - 801.4.1 Electrochemistry

Numerical data indexing: Percentage 9.40e+01%

DOI: 10.1021/acs.inorgchem.0c02875

Funding Details: Number: 2019-KF-01, Acronym: -, Sponsor: State Key Laboratory of High-efficiency Utilization of Coal and Green Chemical Engineering, Ningxia University; Number: 21601097,21805164, Acronym: NSFC, Sponsor:

National Natural Science Foundation of China; Number: 2019J01734, TJGC2018036, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: -, Acronym: TMU, Sponsor: Tarbiat Modares University;

Funding text: We thank the National Natural Science Foundation of China (Grants 21805164 and 21601097), the Natural Science Foundation of Fujian Province (Grant 2019J01734), the Science & Technology Project for Young and Middle-aged Talents (Grant TJGC2018036), the Foundation of State Key Laboratory of High-Efficiency Utilization of Coal and Green Chemical Engineering (Grant 2019-KF-01), and Tarbiat Modares University for their support.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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132. Use of organic bulk-heterojunction solar cells as selective contacts in wide band-gap perovskite solar cells: advantages and limitations

Accession number: 20212610564781

Authors: Su, Lijun (1, 2); Málaga, Maria Méndez (2); Zhu, Miaoli (1); Xiao, Yaoming (3); Gil, Emilio Palomares (2, 4)

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Source title: Journal of Materials Chemistry A

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Pages: 13979-13985

Language: English

ISSN: 20507488

E-ISSN: 20507496

CODEN: JMCAET

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: Our work analyses for the first time the kinetics of perovskite/organic photovoltaic (OPV) interfaces with different perovskite I/Br ratios (MAPbI₃-xBr_x, x= 0, 1, 2, and 3) and PM6:Y6 as a bulk heterojunction blend. The aim was to study in depth the combination of a wide band gap perovskite material - that allows large open-circuit voltage - and the PM6:Y6 thin film that accounts for large photocurrents in organic photovoltaics (OPV). Studies of carrier extraction and carrier recombination kinetics, using time resolved spectroscopy under operando conditions, have been performed to understand the charge dynamics in these cells. Comprehension of the processes in this perovskite solar cell configuration allowed us to foresee important differences in the reorganization of the perovskite internal electric field depending on its composition and how the performance is influenced by different degrees of accumulation of electronic charges at selective contacts. © The Royal Society of Chemistry 2021.

Number of references: 33

Main heading: Perovskite solar cells

Controlled terms: Bromine compounds - Charge carriers - Electric fields - Energy gap - Heterojunctions - Laser spectroscopy - Open circuit voltage - Organic solar cells - Perovskite - Photocurrents - Thin film circuits

Uncontrolled terms: Bulk heterojunction - Carrier extraction - Carrier recombination - Internal electric fields - Large open circuit voltages - Organic bulk-heterojunction solar cells - Organic photovoltaics - Time-resolved spectroscopy

Classification code: 482.2 Minerals - 701.1 Electricity: Basic Concepts and Phenomena - 714.2 Semiconductor Devices and Integrated Circuits - 741.3 Optical Devices and Systems

DOI: 10.1039/d1ta03156b

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Funding text: EP and MM thank ICINN for the project PID2019-109389RB-I00 and the AGAUR for the project SGR-2017SGR00978. ICIQ and ICREA are also acknowledged. LS acknowledges financial support from the program of the China Scholarships Council (2019-08140093). MZ thanks the National Natural Science Foundation

of China (Grant No. 21671124). YX is grateful for the Fujian Natural Science Funds for Distinguished Young Scholar (2020J06046).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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133. Direct Growth of Graphene Nanowalls on Inverted Pyramid Silicon for Schottky Junction Solar Cells

Accession number: 20213110711048

Authors: Huang, Feifei (1, 2, 3); Zhang, Ling (1, 2, 3); Li, Shuai (4); Fu, Junchi (1, 2, 3); Zhang, Kelvin H. L. (5); Cheng, Qijin (1, 2, 3)

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Source title: ACS Applied Energy Materials

Abbreviated source title: ACS Appl. Ener. Mat.

Volume: 4

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Issue date: July 26, 2021

Publication year: 2021

Pages: 6574-6584

Language: English

E-ISSN: 25740962

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: In this work, we develop a radio-frequency plasma-enhanced horizontal tube furnace deposition system to directly grow graphene nanowalls (GNWs) on inverted pyramid (IP) silicon without using catalysts and fabricate GNWs/IP silicon Schottky junction solar cells. The morphology, microstructure, and optical and electrical properties of the synthesized GNWs and IP silicon are investigated. It is shown that GNWs are distributed on the whole surface of the IP silicon and feature an outstanding electrode network. Moreover, in situ optical emission spectroscopy measurement is carried out to investigate the growth process and chemical reaction mechanism of GNWs under the plasma-based process. Due to the excellent light-trapping structure of IP silicon and outstanding electrode network of GNWs, the photovoltaic conversion efficiency (PCE) of the pristine GNWs/IP Si solar cells can reach up to 4.05% via controlling the growth time of GNWs. A PCE of 7.2% can be achieved for the GNWs/IP Si solar cells by combining HNO₃p-doping treatment and spin-coating TiO₂ as an antireflective layer. This work plays a vital role in the development of a simple and advanced process for the realization of high-efficiency graphene-based solar cells. © 2021 American Chemical Society

Number of references: 48

Main heading: Silicon solar cells

Controlled terms: Efficiency - Electrodes - Graphene - Internet protocols - Morphology - Optical emission spectroscopy - Oxide minerals - Silicon - Titanium dioxide

Uncontrolled terms: Anti-reflective layers - Deposition systems - Horizontal tube furnaces - Light trapping structures - Optical and electrical properties - Photovoltaic conversion - Radio frequency plasma - Schottky junctions

Classification code: 482.2 Minerals - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 702.3 Solar Cells - 723 Computer Software, Data Handling and Applications - 761 Nanotechnology - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 913.1 Production Engineering - 941.4 Optical Variables Measurements - 951 Materials Science

Numerical data indexing: Percentage 4.05e+00%, Percentage 7.20e+00%

DOI: 10.1021/acsaem.1c00608

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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134. Nanoporous Nickel-Molybdenum Oxide with an Oxygen Vacancy for Electrocatalytic Nitrogen Fixation under Ambient Conditions

Accession number: 20212910661484

Authors: Xiao, Lin (1); Zhu, Shengli (1, 2, 3, 4); Liang, Yanqin (1, 2); Li, Zhaoyang (1, 2); Wu, Shuilin (1, 2); Luo, Shuiyuan (4); Chang, Chuntao (5); Cui, Zhenduo (1, 2)

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Source title: ACS Applied Materials and Interfaces

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Issue date: July 7, 2021

Publication year: 2021

Pages: 30722-30730

Language: English

ISSN: 19448244

E-ISSN: 19448252

Document type: Journal article (JA)

Publisher: American Chemical Society

Abstract: The electrochemical nitrogen reduction reaction (NRR) is regarded as a sustainable method for N₂ fixation. N₂ adsorption and NN cleavage are the main challenges for the NRR. Herein, we propose a potential approach to enhance N₂ activation via introducing oxygen vacancies (OVs) into nanoporous NiO/MoO₃. Nanoporous NiO/MoO₃ with OVs (np-OVs-NiO/MoO₃) is prepared by a two-step process of dealloying and solid-state reaction. np-OVs-NiO/MoO₃ exhibits a high NH₃ yield of 35.4 μg h⁻¹ mgcat⁻¹ and a Faradaic efficiency (FE) of 10.3% in 0.1 M PBS solution. The introduction of OVs enhances the conductivity, N₂ adsorption, and catalytic performance of np-NiO/MoO₃. The dual-metal sites with OVs have a unique electronic structure in favor of the "back-donation" behavior, which decreases the energy barrier of protonation steps and improves the whole NRR process. This approach provides new insight into the design of composite transition metal oxides with OVs for the NRR catalyst under ambient conditions. ©

Number of references: 54

Main heading: Nitrogen fixation

Controlled terms: Ammonia - Dealloying - Electronic structure - Molybdenum oxide - Nickel oxide - Oxygen vacancies - Solid state reactions - Transition metal oxides - Transition metals

Uncontrolled terms: Ambient conditions - Catalytic performance - Design of composites - Electrocatalytic - Faradaic efficiencies - Nickel molybdenum - Nitrogen reduction - Two-step process

Classification code: 531 Metallurgy and Metallography - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933.1 Crystalline Solids

Numerical data indexing: Mass_Flow_Rate 9.83e-12kg/s, Percentage 1.03e+01%

DOI: 10.1021/acsami.1c07613

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2021 Elsevier Inc.

135. Concentrating and recycling of high-concentration printing and dyeing wastewater by a disc tube reverse osmosis-Fenton oxidation/low temperature crystallization process

Accession number: 20211310135203

Authors: Jing, Xinjun (1, 2, 3); Yuan, Junsheng (1, 2, 3, 4); Cai, Daniu (4); Li, Bin (1, 2, 3); Hu, Dongliang (4); Li, Jianyang (4)

Author affiliation: (1) School of Chemical Engineering and Technology, Hebei University of Technology, Tianjin; 300130, China; (2) Engineering Research Center of Seawater Utilization of Ministry of Education, Tianjin; 300130, China; (3) Hebei Collaborative Innovation Center of Modern Marine Chemical Technology, Tianjin; 300130, China; (4) College of Chemical Engineering and Material, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Yuan, Junsheng(jsyuan2012@126.com)

Source title: Separation and Purification Technology

Abbreviated source title: Sep. Purif. Technol.

Volume: 266

Issue date: July 1, 2021

Publication year: 2021

Article number: 118583

Language: English

ISSN: 13835866

E-ISSN: 18733794

CODEN: SPUTFP

Document type: Journal article (JA)

Publisher: Elsevier B.V.

Abstract: A novel three-step process consisting of disc tube reverse osmosis (DTRO), Fenton oxidation, and low temperature crystallization is described for the treatment of printing and dyeing wastewater. The DTRO step was used to further concentrate the wastewater obtained from a nanofiltration (NF) treatment. The desalinated water can be directly reused in the production process, and the COD, TOC, TDS, and SO₄²⁻ concentrations of the concentrated wastewater were above 1500 mg/L, 500 mg/L, 150 g/L, and 100 g/L, respectively. The concentrated wastewater was then treated by Fenton oxidation, and the COD, TOC, and chroma removal rates in this step were over 80%, 80%, and nearly 100%, respectively. Finally, when the crystallization end point temperature was 0 °C, the recovery and purity of the product were above 60% and 99%, respectively. For the small amount of Cl⁻ contained in the crystalline mother liquor, the Cl⁻ and SO₄²⁻ in the mother liquor were separated by NF and then sent back to the DTRO step to be re-concentrated. The degradation of organic compounds in wastewater was studied by UV-Vis spectroscopy, three-dimensional fluorescence spectroscopy (3D-EEM), and total organic carbon analyzer. The crystalline products were characterized by X-ray diffraction. The results showed that this new coupling process can realize high reuse of printing and dyeing wastewater. © 2021

Number of references: 33

Main heading: Oxidation

Controlled terms: Chemical oxygen demand - Crystallization - Dyeing - Fluorescence spectroscopy - Organic carbon - Reverse osmosis - Temperature - Wastewater reclamation - Wastewater treatment

Uncontrolled terms: Concentrated wastewater - Crystallization process - Disk tube reverse osmosis - Fenton's oxidation - High-concentration printing and dyeing wastewater - Low-temperature crystallization - Mother liquor - Printing and dyeing wastewaters - SO₄²⁻ - Three-step process

Classification code: 452.4 Industrial Wastes Treatment and Disposal - 641.1 Thermodynamics - 741.3 Optical Devices and Systems - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.1 Organic Compounds - 941.3 Optical Instruments - 941.4 Optical Variables Measurements

Numerical data indexing: Mass density 1.00E+02kg/m³, Mass density 1.50E+00kg/m³, Mass density 1.50E+02kg/m³, Mass density 5.00E-01kg/m³, Percentage 1.00E+02%, Percentage 6.00E+01%, Percentage 8.00E+01%, Percentage 9.90E+01%, Size 5.08E-02m, Temperature 2.73E+02K

DOI: 10.1016/j.seppur.2021.118583

Funding text: This study was supported by the National Key Research and Development Programme of China (2016YFB0600504). The research was also supported by the science and technology of Quanzhou City, Fujian Province, China (2019C107).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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136. Characterization of the airflow field in the rotor spinning unit based on a novel experimental approach and numerical simulation

Accession number: 20203809204648

Authors: Shi, Qianqian (1); Akankwasa, Nicholas Tayari (1); Zhang, Yuze (1); Wang, Jiang (1); Wang, Jun (1); Lin, Huiting (2)

Author affiliation: (1) College of Textiles, Donghua University, China; (2) College of Textile and Fashion, Quanzhou Normal University, China

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Source title: Textile Research Journal

Abbreviated source title: Text. Res. J.

Volume: 91

Issue: 7-8

Issue date: April 2021

Publication year: 2021

Pages: 717-728

Language: English

ISSN: 00405175

CODEN: TRJOA9

Document type: Journal article (JA)

Publisher: SAGE Publications Ltd

Abstract: It is very challenging to experimentally characterize and verify the airflow in the rotor spinning machine because the process takes place in an enclosure. In an attempt to portray the process, we present a methodology that combines a novel experimental approach and numerical techniques. We developed a model unit and used colored smoke to mimic the airflow behavior practically, measured the air pressure, and compared the results to the simulation data. Three state conditions, namely suction and rotation (the regular rotor spinning operation, (Case 1)), without rotation (Case 2), and without suction (Case 3), were adopted to investigate the formation mechanism of the airflow field in the rotor spinning unit based on two operating conditions. Results show that, in a regular state, the airstream accelerates rapidly in the transfer channel under the dominant action of air suction at the rotor outlet and crashes clockwise to the rotor wall with the joint action of two operating conditions. In the rotor, the airflow flows clockwise with the velocity distribution of a multi-ring gradient due to the dominant action of high-speed rotor rotation. Analytics from the air pressure indicate that while the air pressure in the rotor is mainly controlled by the action of the air suction mechanism, it is also affected by the superposition action of the rotation mechanism. This approach is groundbreaking for rotor spinning machine optimization and is anticipated to trigger more insights that will lead to fundamental research in the spinning industry and beyond. © The Author(s) 2020.

Number of references: 19

Main heading: Air

Controlled terms: Atmospheric pressure - Clocks - Rotation - Smoke - Spinning machines - Textile industry

Uncontrolled terms: Experimental approaches - Formation mechanism - Fundamental research - High-speed rotors - Numerical techniques - Operating condition - Rotation mechanism - Transfer channel

Classification code: 443.1 Atmospheric Properties - 804 Chemical Products Generally - 819.6 Textile Mills, Machinery and Equipment - 931.1 Mechanics - 943.3 Special Purpose Instruments

DOI: 10.1177/0040517520957400

Funding Details: Number: CUSF-DH-D-2019058, Acronym: -, Sponsor: -; Number: 11802161, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Fundamental Research Funds for the Central Universities and Graduate Student Innovation Fund of Donghua University (CUSF-DH-D-2019058) and the National Natural Science Foundation of China (Grant No. 11802161).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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137. Self-supported Ni₃Se₂@NiFe layered double hydroxide bifunctional electrocatalyst for overall water splitting

Accession number: 20210109730520

Authors: Hu, Jin (1); Zhu, Shengli (1, 2, 3, 4); Liang, Yanqin (1, 3); Wu, Shuilin (1, 3); Li, Zhaoyang (1, 3); Luo, Shuiyuan (4); Cui, Zhenduo (1)

Author affiliation: (1) School of Materials Science and Engineering, Tianjin University, Tianjin; 300350, China; (2) Tianjin Key Laboratory of Composite and Functional Materials, Tianjin; 300350, China; (3) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (4) College of Chemistry Engineering and Materials Science, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Zhu, Shengli(slzhu@tju.edu.cn)

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Abbreviated source title: J. Colloid Interface Sci.

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Publication year: 2021

Pages: 79-89

Language: English

ISSN: 00219797

E-ISSN: 10957103

CODEN: JCISA5

Document type: Journal article (JA)

Publisher: Academic Press Inc.

Abstract: Low-cost, highly active and earth-abundant bifunctional electrocatalyst is very important for the large-scale hydrogen production by water splitting. In the present work, we report a novel two-step method to fabricate three-dimensional (3D) porous catalyst for water splitting. The Ni₃Se₂ nanowires are in-situ formed on Ni foam (NF) by simple hydrothermal method, subsequently NiFe layered double hydroxid (NiFe-LDH) nanosheets vertically grow on the nanowires to form core-shell structure. The as-formed Ni₃Se₂@NiFe-LDH/NF catalyst shows 3D porous structure, which can provide large specific surface area and effective substance transfers. The tight bonding between Ni₃Se₂ nanowires and NiFe-LDH nanosheets ensures good electron transfer. The Ni₃Se₂@NiFe-LDH/NF catalyst exhibits outstanding electrocatalytic property for both hydrogen evolution reaction (HER) and oxygen evolution reaction (OER) in an alkaline medium. The overpotentials for HER and OER at the current density of 10 mA cm⁻² in 1 M KOH are 68 mV and 222 mV, respectively. For overall water splitting, a small cell voltage of 1.55 V can achieve a current density of 10 mA cm⁻² in 1 M KOH. This work provides a guidance for the rational design and development of heterostructure electrocatalysts for overall water splitting. © 2020 Elsevier Inc.

Number of references: 56

Main heading: Hydrogen production

Controlled terms: Electrocatalysts - Electron transport properties - Hydrogen evolution reaction - Nanosheets - Nanowires - Oxygen evolution reaction - Potassium hydroxide - Selenium compounds

Uncontrolled terms: Bifunctional electrocatalysts - Electrocatalytic properties - Hydrothermal methods - Large scale hydrogen production - Large specific surface areas - Layered double hydroxides - Oxygen evolution reaction (oer) - Threedimensional (3-d)

Classification code: 522 Gas Fuels - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 933 Solid State Physics

Numerical data indexing: Voltage 1.55e+00V, Voltage 2.22e-01V, Voltage 6.80e-02V

DOI: 10.1016/j.jcis.2020.12.016

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Funding text: We gratefully acknowledge support by the National Natural Science Foundation of China (51771131).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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138. High-precision detection of ordinary sound by electrospun polyacrylonitrile nanofibers

Accession number: 20211310129206

Authors: Peng, Lu (1); Jin, Xin (2); Niu, Jiarong (1); Wang, Wenyu (1); Wang, Hongxia (3); Shao, Hao (3); Lang, Chenhong (4); Lin, Tong (3)

Author affiliation: (1) State Key Laboratory of Separation Membranes and Membrane Processes, School of Textile Science and Engineering, Tiangong University, Tianjin; 300387, China; (2) State Key Laboratory of Separation Membranes and Membrane Processes, School of Materials Science and Engineering, Tiangong University, Tianjin; 300387, China; (3) Institute for Frontier Materials, Deakin University, Geelong; Victoria; 3216, Australia; (4) College of Textiles and Apparel, Quanzhou Normal University, Quanzhou; 362000, China

Corresponding author: Wang, Wenyu

Source title: Journal of Materials Chemistry C

Abbreviated source title: J. Mater. Chem. C

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Publication year: 2021

Pages: 3477-3485

Language: English

ISSN: 20507534

E-ISSN: 20507526

CODEN: JMCCCX

Document type: Journal article (JA)

Publisher: Royal Society of Chemistry

Abstract: Polyacrylonitrile (PAN) nanofibers show piezoelectric properties and the capability to harvest sound energy for power generation purposes. However, their application as an acoustic sensor to detect sound was not studied. In this paper, we report the novel amazing ability of electrospun PAN nanofibers to precisely detect low-to-middle frequency sound (100-600 Hz) at the middle sound pressure level (60-95 dB), which covers the main sound spectrum in our daily activities. The nanofiber sensor device shows high sensitivity, with a signal-to-noise ratio as high as 57.2

dB and fidelity as high as 0.995. Compared to the acoustic sensor made of electrospun poly(vinylidene fluoride) nanofibers under the same condition, our PAN device has a much wider response bandwidth, larger sensitivity, and higher fidelity, indicating the important role of polymer type in the acoustic detection of electrospun nanofibers. The brilliant detection accuracy originates from the high piezoelectricity and rigidity of PAN nanofibers, facilitating deformation recovery and reduction of the interference from harmonics. To demonstrate the remarkable sound detection ability, we used the PAN device to convert a piece of music into electrical signals and then converted the electrical signals into sound. The playback sound was almost identical to the original sound waves. Electrospun polyacrylonitrile nanofibers may form a novel acoustoelectric transducer for accurate sound detection and other high-tech applications. © The Royal Society of Chemistry 2021.

Number of references: 35

Main heading: Nanofibers

Controlled terms: Acoustic devices - Acoustic variables measurement - Crystallography - Fluorine compounds - Piezoelectricity - Signal to noise ratio

Uncontrolled terms: Electrospun nanofibers - High piezoelectricities - High precision detections - High-tech applications - Piezoelectric property - Poly(vinylidene fluoride) - Polyacrylonitrile (PAN) - Polyacrylonitrile nanofibers

Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 716.1 Information Theory and Signal Processing - 752.1 Acoustic Devices - 761 Nanotechnology - 933 Solid State Physics - 933.1 Crystalline Solids - 941.2 Acoustic Variables Measurements

Numerical data indexing: Decibel 5.72e+01dB, Decibel 6.00e+01dB to 9.50e+01dB, Frequency 1.00e+02Hz to 6.00e+02Hz

DOI: 10.1039/d0tc05446a

Funding Details: Number: -, Acronym: ARC, Sponsor: Australian Research Council; Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: TRC, Sponsor: The Research Council;

Funding text: Funding support from the key project of the Natural Science Foundation of Tianjin (20JCZDJC00350), the National Natural Science Foundation of China (Grant No. 51803108), and the Australian research council through a discovery project (DP180101161) is acknowledged.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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139. Study on the difference in exciton generation processes for a single host and exciplex-type co-host

Accession number: 20213910957006

Authors: Xu, Huiwen (1); Lin, Jinyu (1); Jiang, Xinyan (1); Jin, Yu (1); Lin, Zhili (1); Zhang, Xining (1); Li, Xiaoyan (1); Yang, Huishan (2); Wu, Zhijun (1, 3)

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Corresponding author: Wu, Zhijun(zhijunwu@hqu.edu.cn)

Source title: Optics Letters

Abbreviated source title: Opt. Lett.

Volume: 46

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Issue date: October 1, 2021

Publication year: 2021

Pages: 4840-4843

Language: English

ISSN: 01469592

E-ISSN: 15394794

CODEN: OPLEDP

Document type: Journal article (JA)

Publisher: The Optical Society

Abstract: We distinctly reveal the difference in the exciton generation processes in phosphorescent organic light-emitting devices with an exciplex-type co-host and a single host. Excitons in the co-host consisting of 4,4,4-tris(N-carbazolyl)-triphenylamine and 1,3,5-tris(N-phenylbenzimidazol-2-yl)benzene are created via efficient energy transfer

from the exciplex to the phosphorescent dopant. In contrast, excitons in the single host of 4,4,4-tris(N-carbazolyl)-triphenylamine are formed by the combination of holes and electrons trapped by the phosphorescent dopants. The optimized device utilizing the co-host system exhibits highly superior performance relative to the single-host device. The maximum external quantum efficiency and maximum luminance are 14.88% and 90,700 cd/m² for the co-host device, being 1.6 times and 3.6 times the maximum external efficiency and maximum luminance for the single-host device, respectively. Significantly, the critical current density, evaluating the device efficiency roll-off characteristic, is as high as 327.8 mA/cm², which is highly superior to 120.8 mA/cm² for the single-host device, indicating the notable alleviation in efficiency roll-off for the co-host device. The significant improvement in device performance is attributed to eliminating the exciton quenching resulting from the captured holes and the efficient energy transfer from the exciplex-type co-host to the phosphorescent emitter incurred by the reverse intersystem crossing process. © 2021 Optical Society of America

Number of references: 24

Main heading: Phosphorescence

Controlled terms: Energy transfer - Excitons - Luminance - Organic light emitting diodes (OLED)

Uncontrolled terms: Carbazolyl - Co-host - Efficient energy transfer - Exciplexes - Exciton generation - Generation process - Host devices - Maximum luminance - Phosphorescent dopant - Triphenylamines

Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics

Numerical data indexing: Magnetic field strength 1.208E+01A/m, Magnetic field strength 3.278E+01A/m, Percentage 1.488E+01%

DOI: 10.1364/OL.439516

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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