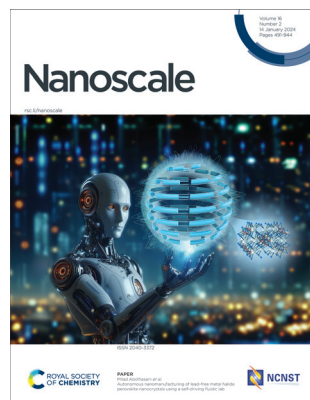


IN THIS ISSUE

ISSN 2040-3372 CODEN NANOHL 16(2) 491–944 (2024)



Cover

See Milad Abolhasani *et al.*, pp. 580–591.

Image reproduced by permission of Milad Abolhasani from *Nanoscale*, 2024, **16**, 580.

REVIEWS

504

Advancements in silicon carbide-based supercapacitors: materials, performance, and emerging applications

Yangwen Liu, Guanghuan Li, Li Huan* and Sheng Cao



527

Recent advances in two-dimensional intrinsic ferromagnetic materials Fe_3X ($\text{X}=\text{Ge}$ and Ga) Te_2 and their heterostructures for spintronics

Xia Chen, Xi Zhang and Gang Xiang



Fuelling your energy research



Energy & Environmental Science

Agenda-setting research in energy science and technology

Chair of the Editorial Board

Jenny Nelson, Imperial College London, UK

Impact factor 2021: 39.714, median time to first decision (peer reviewed articles only): 46 days*.

rsc.li/ees



EES Catalysis

Exceptional research on energy and environmental catalysis

Editor-in-Chief

Shizhang Qiao, University of Adelaide, Australia

Median time to first decision (peer reviewed articles only): 24 days*.

rsc.li/ees-catalysis



Sustainable Energy & Fuels

Driving the development of sustainable energy technologies through cutting edge research

Editor-in-Chief

Garry Rumbles, National Renewable Energy Laboratory and University of Colorado Boulder, USA

Impact factor 2021: 6.813, median time to first decision (peer reviewed articles only): 28 days*.

rsc.li/sustainable-energy



Energy Advances

Embracing research at the nexus of energy science and sustainability

Editor-in-Chief

Volker Presser, Leibniz Institute for New Materials, Germany

Median time to first decision (peer reviewed articles only): 32 days*.

rsc.li/energy-advances

Submit your work today

rsc.li/energy

*Visit rsc.li/metrics-explainer for more information

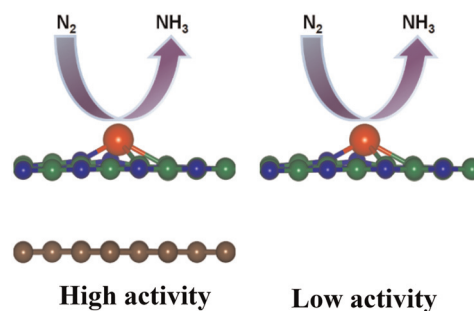
Registered charity number: 207890

COMMUNICATIONS

555

Single-atom catalysts supported on a hybrid structure of boron nitride/graphene for efficient nitrogen fixation *via* synergistic interfacial interactions

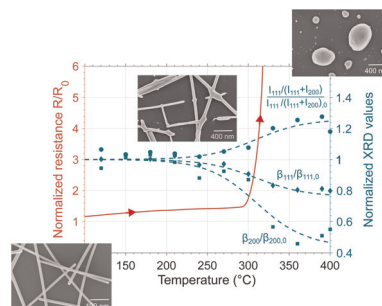
Mohammad Zafari, Rohit Anand, Arun S. Nissimagoudar, Miran Ha, Geunsik Lee* and Kwang S. Kim



564

Exploring the degradation of silver nanowire networks under thermal stress by coupling *in situ* X-ray diffraction and electrical resistance measurements

Laetitia Bardet, Hervé Roussel, Stefano Saroglia, Masoud Akbari, David Muñoz-Rojas, Carmen Jiménez, Aurore Denneulin and Daniel Bellet

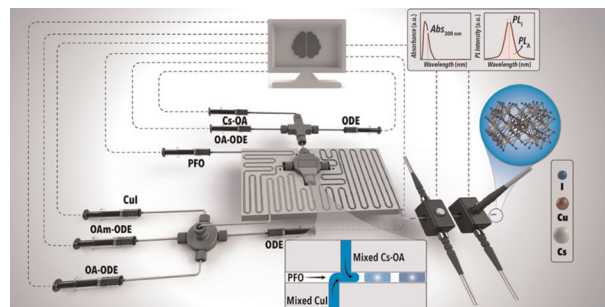


PAPERS

580

Autonomous nanomanufacturing of lead-free metal halide perovskite nanocrystals using a self-driving fluidic lab

Sina Sadeghi, Fazel Bateni, Taekhoon Kim, Dae Yong Son, Jeffrey A. Bennett, Negin Orouji, Venkat S. Punati, Christine Stark, Teagan D. Cerra, Rami Awad, Fernando Delgado-Licona, Jinge Xu, Nikolai Mukhin, Hannah Dickerson, Kristofer G. Reyes and Milad Abolhasani



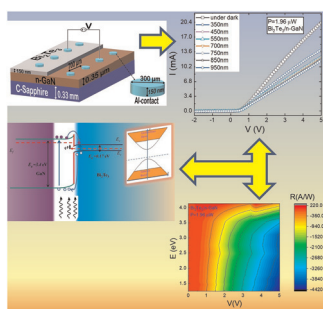
592

Not all silicon quantum dots are equal: photostability of silicon quantum dots with and without a thick amorphous shell

I Teng Cheong, LiYifan Yang Szepesvari, Chuyi Ni, Cole Butler, Kevin M. O'Connor, Riley Hooper, Alkiviathes Meldrum and Jonathan G. C. Veinot



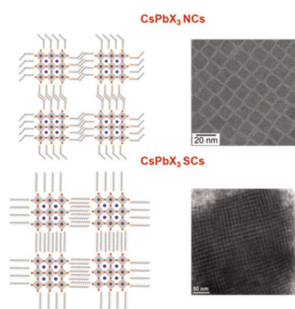
604



Aberrant photoelectric effect in the topological insulator/n-GaN heterojunction ($\text{Bi}_2\text{Te}_3/\text{n-GaN}$) under unpolarized illumination

Faizan Ahmad, Kavindra Kandpal, Roshani Singh, Rachana Kumar and Pramod Kumar

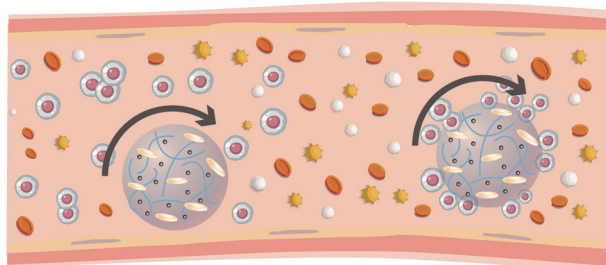
614



Direct synthesis of CsPbX_3 perovskite nanocrystal assemblies

Chujie Wang, Sri K. Matta, Chun Kiu Ng, Chang Cao, Manoj Sharma, Anthony S. R. Chesman, Salvy P. Russo and Jacek J. Jasieniak

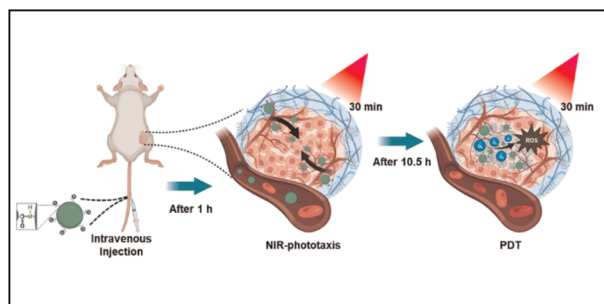
624



An extracellular matrix-mimicking magnetic microrobot for targeted elimination of circulating cancer cells

Jing Huang, Yuan Liu, Jiandong Wu, Fuping Dong, Chu Liu, Jiawei Luo, Xiangchao Liu, Ning Wang, Lei Wang and Haifeng Xu

635



A NIR-driven green affording-oxygen microrobot for targeted photodynamic therapy of tumors

Lishan Zhang, Xiaoting Zhang, Hui Ran, Ze Chen, Yicheng Ye, Jiamiao Jiang, Ziwei Hu, Miral Azechi, Fei Peng, Hao Tian, Zhili Xu* and Yingfeng Tu

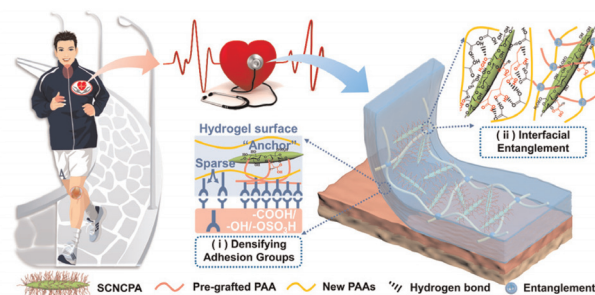


PAPERS

645

Fabrication of a tough, long-lasting adhesive hydrogel patch via the synergy of interfacial entanglement and adhesion group densification

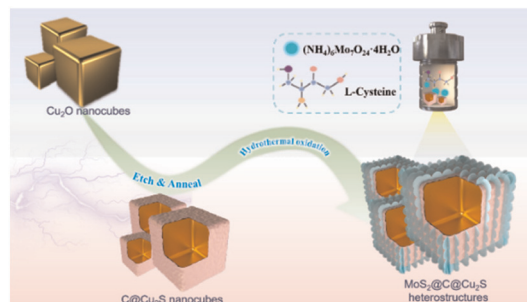
Yunjie Lu, Zhaohui Li, Zewei Li, Shihao Zhou, Ning Zhang, Jianming Zhang and Lu Zong



657

Novel hollow $\text{MoS}_2@\text{C}@\text{Cu}_2\text{S}$ heterostructures for high zinc storage performance

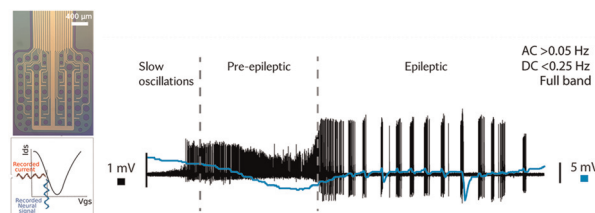
Yujin Li, Jing Xu, Xinqi Luo, Futing Wang, Zhong Dong, Ke-Jing Huang, Chengjie Hu, Mengyi Hou and Ren Cai



664

Recording physiological and pathological cortical activity and exogenous electric fields using graphene microtransistor arrays *in vitro*

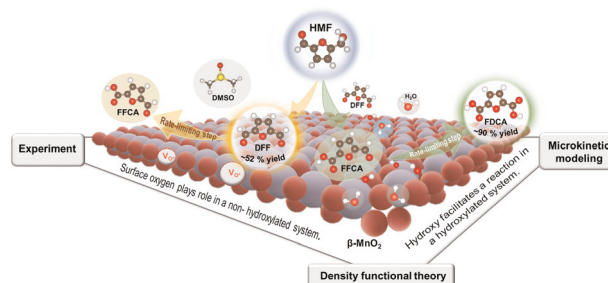
Nathalia Cancino-Fuentes, Arnau Manasanch, Joana Covelo, Alex Suarez-Perez, Enrique Fernandez, Stratis Matsoukis, Christoph Guger, Xavi Illa, Anton Guimerà-Brunet and Maria V. Sanchez-Vives



678

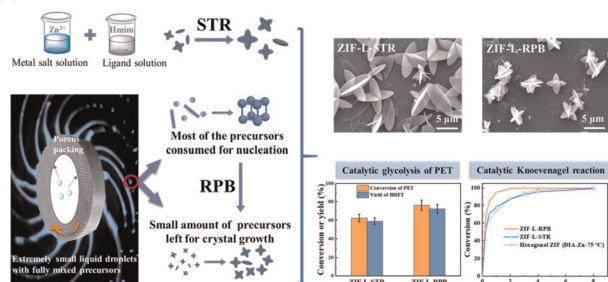
Hydroxy and surface oxygen effects on 5-hydroxymethylfurfural oxidation to 2,5-furandicarboxylic acid on $\beta\text{-MnO}_2$: DFT, microkinetic and experiment studies

Bunrat Tharat, Lappawat Ngamwongwan, Theerada Seehamongkol, Bunyarat Rungtaweeworant, Jeeranan Nonkumwong, Suwit Suthirakun, Kajornsak Faungnawakij, Narong Chanlek, Aunyananee Plucksacholarn, Weerawan Nimsaila, Chanatkrin Prommin and Anchalee Junkaew



PAPERS

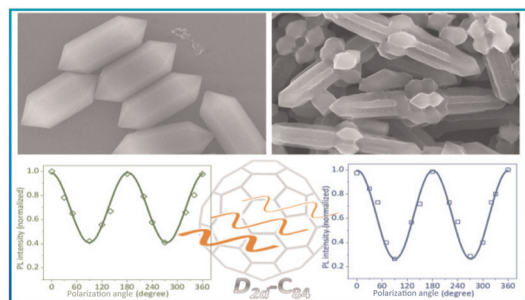
691



The controllable and efficient synthesis of two-dimensional metal–organic framework nanosheets for heterogeneous catalysis

Ling-Xia Yun, Cong Zhang, Xin-Ran Shi, Yan-Jun Dong, Hang-Tian Zhang, Zhi-Gang Shen and Jie-Xin Wang

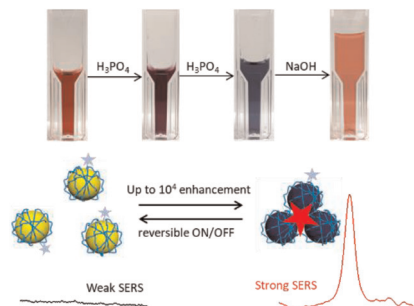
701



Crystalline architectures of C₈₄ with tunable morphology and linearly polarized red emission

Feng Wang, Botao Zhu, Jie Xiong, Shuo Wu, Jiaxin Sun, Hailin Cong* and Lai Feng

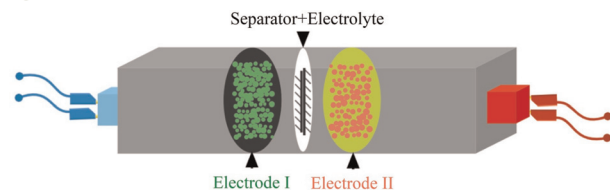
708



Strongly coupled plasmonic metal nanoparticles with reversible pH-responsiveness and highly reproducible SERS in solution

Zichao Wei, Audrey Vandergriff, Chung-Hao Liu, Maham Liaqat, Mu-Ping Nieh, Yu Lei and Jie He

719



Unlocking the full potential of citric acid-synthesized carbon dots as a supercapacitor electrode material *via* surface functionalization

Melis Özge Alaş Çolak, Ahmet Güngör, Merve Buldu Akturk, Emre Erdem* and Rükan Genç

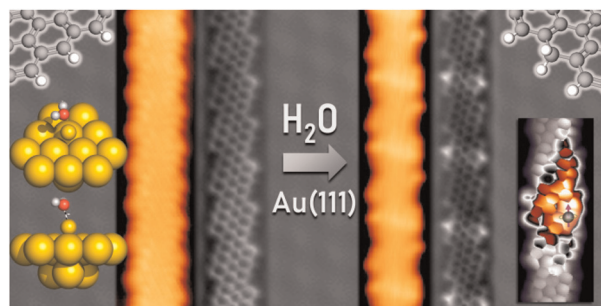


PAPERS

734

The effect of water on gold supported chiral graphene nanoribbons: rupture of conjugation by an alternating hydrogenation pattern

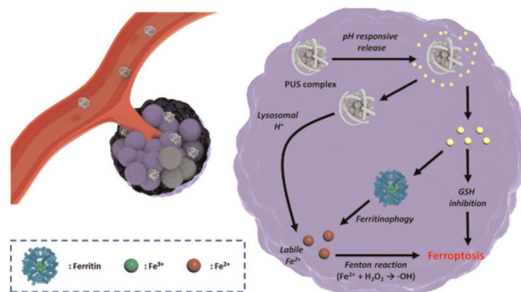
Alejandro Berdonces-Layunta, Adam Matěj, Alejandro Jiménez-Martín, James Lawrence, Mohammed S. G. Mohammed, Tao Wang, Benjamin Mallada, Bruno de la Torre, Adrián Martínez, Manuel Vilas-Varela, Reed Nieman, Hans Lischka, Dana Nachtigallová, Diego Peña, Pavel Jelínek* and Dimas G. de Oteyza



742

A polymeric iron oxide nanocomplex loaded with sulfasalazine: an approach for inducing ferritinophagy-assisted ferroptosis for anti-cancer therapy

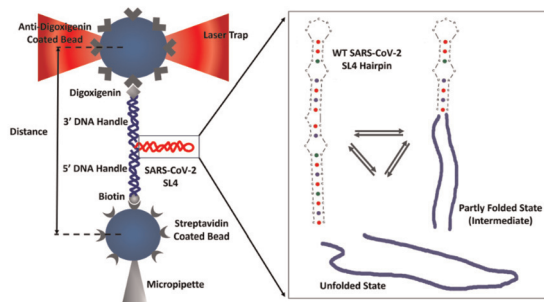
Junha Lim, Junseok Lee, Yeonju Boo and Won Jong Kim



752

Exploring the conformational dynamics of the SARS-CoV-2 SL4 hairpin by combining optical tweezers and base analogues

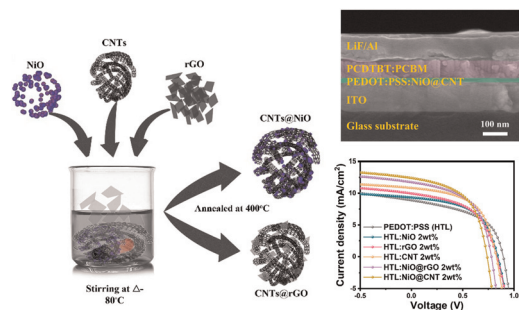
Vinoth Sundar Rajan, Anna Wypijewska del Nogal, Sune Levin, L. Marcus Wilhelmsson* and Fredrik Westerlund



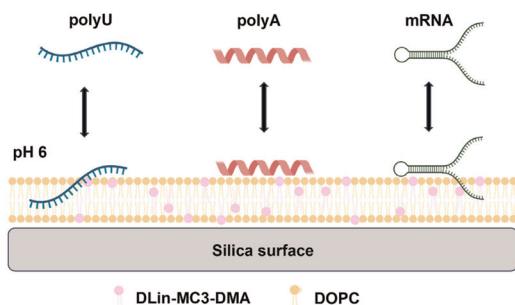
765

Metal oxide-embedded carbon-based materials for polymer solar cells and X-ray detectors

Sikandar Aftab, Hailiang Liu, Dhanasekaran Vikraman, Sajjad Hussain, Jungwon Kang* and Abdullah A. Al-Kahtani



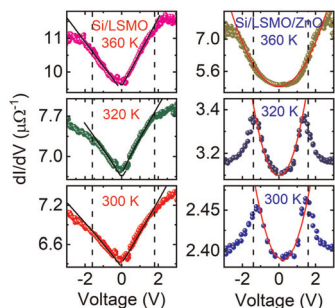
777



On the interactions between RNA and titrateable lipid layers: implications for RNA delivery with lipid nanoparticles

Jennifer Gilbert, Inna Ermilova, Marco Fornasier, Maximilian Skoda, Giovanna Fragneto, Jan Swenson and Tommy Nylander

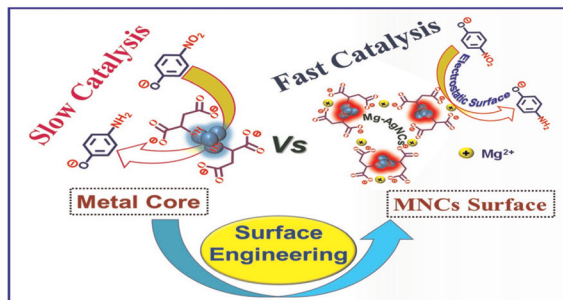
795



Reformation of $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ properties by using ZnO in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ -ZnO heterostructures grown on (001) oriented Si

Bibekananda Das and Prahallad Padhan

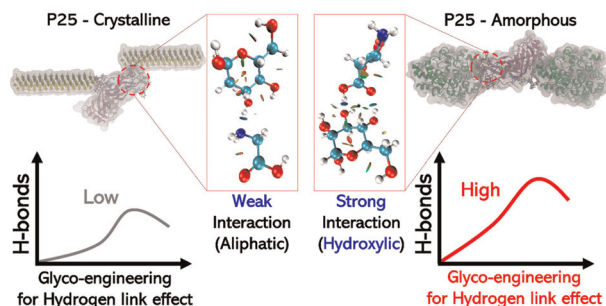
806



Mechanistic elucidation of the catalytic activity of silver nanoclusters: exploring the predominant role of electrostatic surface

Paritosh Mahato, Shashi Shekhar, Rahul Yadav and Saptarshi Mukherjee

821



An atomistic scale simulation study of structural properties in the silk–fibrohexamerin complex

Wooboom Park, Taeyoung Yoon, Hyunjoon Chang, Juneseok You* and Sungsoo Na

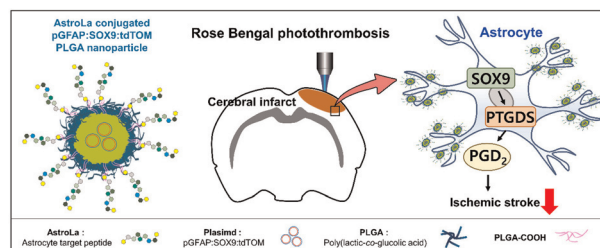


PAPERS

833

Peptide-mediated targeted delivery of SOX9 nanoparticles into astrocytes ameliorates ischemic brain injury

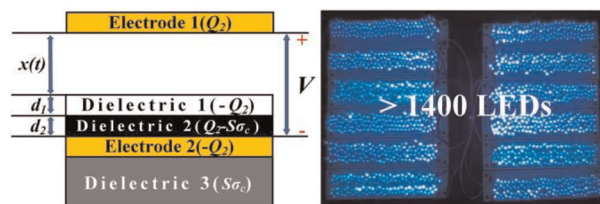
Hyo Jung Shin, Seung Gyu Choi, Fengrui Qu, Min-Hee Yi, Choong-Hyun Lee, Sang Ryong Kim, Hyeong-Geug Kim, Jaewon Beom, Yoonyoung Yi, Do Kyung Kim, Eun-Hye Joe, Hee-Jung Song, Yonghyun Kim* and Dong Woon Kim



848

A new triboelectric nanogenerator based on a multi-material stacking structure achieves efficient power conversion from discrete mechanical movement

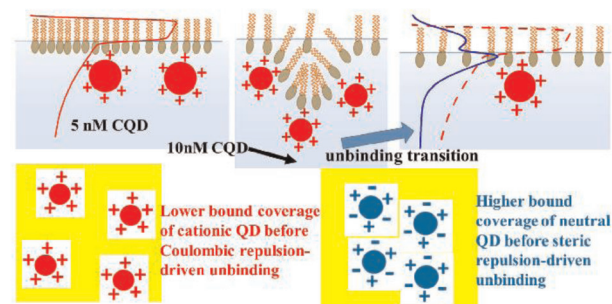
Jianfeng Luo, Yuxiang Su, Anguo Liu, Guanyu Dai, Xinyao Zhang, Xiaonan Su, Yilei Shao, Zhenhua Li, Xizeng Zhao and Keyang Zhao



856

Spontaneous unbinding transition of nanoparticles adsorbing onto biomembranes: interplay of electrostatics and crowding

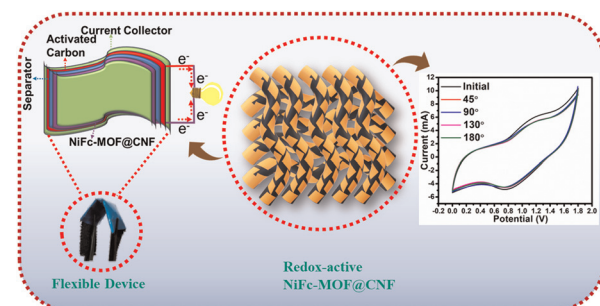
Anurag Chaudhury, Koushik Debnath, Nikhil R. Jana and Jaydeep K. Basu



868

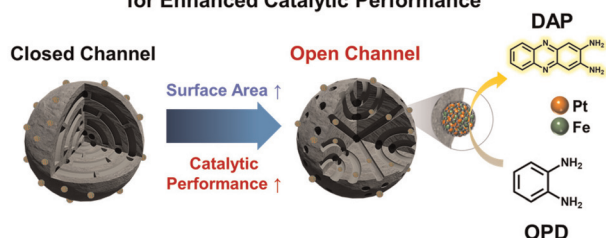
In situ growth of a redox-active metal–organic framework on electrospun carbon nanofibers as a free-standing electrode for flexible energy storage devices

Zahir Abbas, Nissar Hussain, Surender Kumar and Shaikh M. Mobin



879

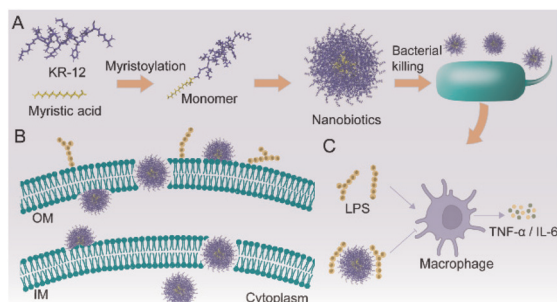
Tuning Porous Carbon Channel Structures for Enhanced Catalytic Performance



Impact of channel nanostructures of porous carbon particles on their catalytic performance

Hyunkyu Oh, Young Jun Lee, Eun Ji Kim, Jinseok Park, Hee-Eun Kim, Hyunsoo Lee, Hyunjoon Lee and Bumjoon J. Kim

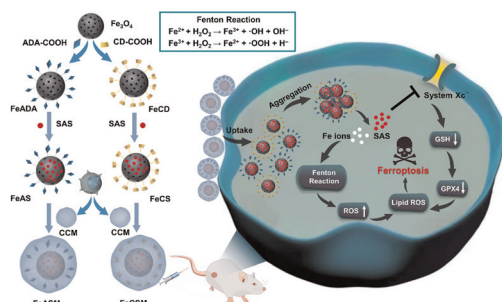
887



Turning cationic antimicrobial peptide KR-12 into self-assembled nanobiotics with potent bacterial killing and LPS neutralizing activities

Ruyi Lei, Chujun Yang, Yaqi Sun, Dejian Li, Liman Hao, Yang Li, Shuijing Wu, Hui Li, Chao Lan* and Xiangming Fang

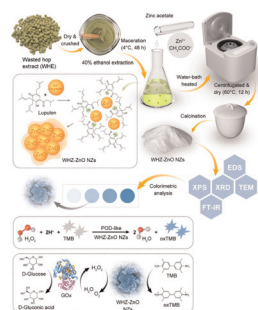
903



Intracellular self-aggregation of biomimetic Fe₃O₄ nanoparticles for enhanced ferroptosis-inducing therapy of breast cancer

Zhendong Zhang, Beibei Xie, Xiaojie Lu, Lishan Xiong, Xinyuan Li, Yan Zhang, Chunlai Li* and Chenhui Wang

913



Facile green synthesis of wasted hop-based zinc oxide nanozymes as peroxidase-like catalysts for colorimetric analysis

Pei Liu, Mengdi Liang, Zhengwei Liu, Haiyu Long, Han Cheng, Jiahe Su, Zhongbiao Tan, Xuewen He, Min Sun, Xiangqian Li and Shuai He

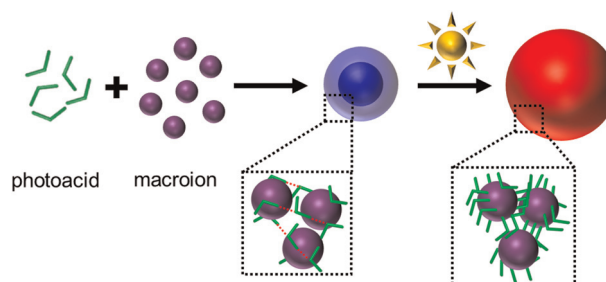


PAPERS

923

Photoacid-macroion assemblies: how photo-excitation switches the size of nano-objects

Alexander Zika, Mohit Agarwal, Wiebke Zika, Dirk M. Guldi, Ralf Schweins and Franziska Gröhn



CORRECTION

941

Correction: Elaborating the interplay between the detecting unit and emitting unit in infrared quantum dot up-conversion photodetectors

Qiulei Xua, Xinxin Yang, Jiao Jiao Liu, Fei Li, Ruiguang Chang, Lei Wang, A Qiang Wang, Zhenghui Wu, Huaibin Shen and Zuliang Du

