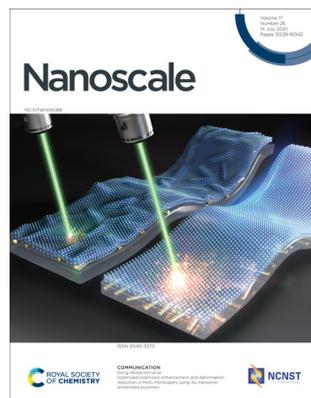


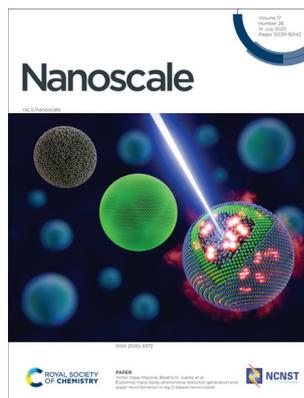
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ISSN 2040-3372 CODEN NANOHL 17(26) 15539–16042 (2025)



Cover
See Dong-Wook Kim *et al.*,
pp. 15690–15696.

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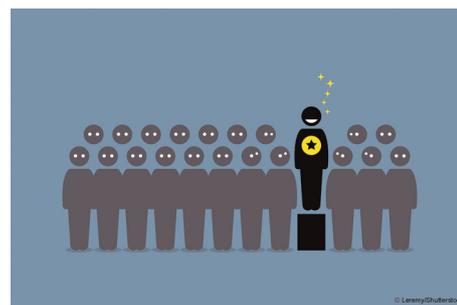
Inside cover
See Victor Vega-Mayoral,
Beatriz H. Juárez *et al.*,
pp. 15697–15705.

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EDITORIAL

15552

Outstanding Reviewers for *Nanoscale* in 2024

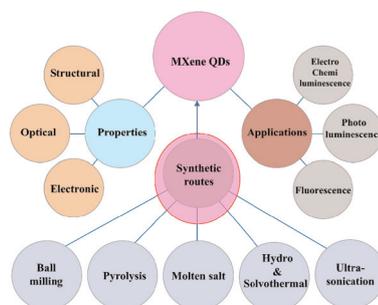


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Optoelectronic MXene quantum dots: frontiers in sensor technology for next-generation diagnostics and environmental monitoring

Ankur Singh, Supratim Mahapatra, Rajendra Prasad, Sumit Kumar Singh and Pranjal Chandra*



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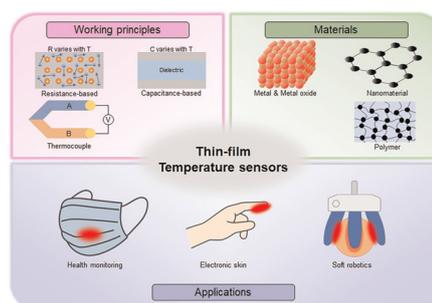
Fundamental questions
Elemental answers

REVIEWS

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Advances in nanomaterial thin-film temperature sensors: materials and applications

Sangjin Yoon and Seung Hwan Ko*

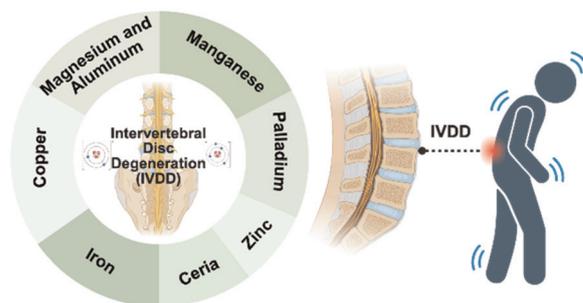


MINIREVIEWS

15605

The application prospect of metal/metal oxide nanoparticles in the treatment of intervertebral disc degeneration

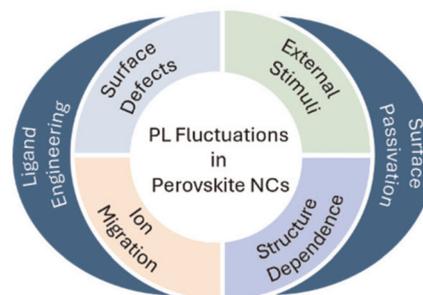
Long Zhang, Haijiang Ren, Fang Cai, Bin Ru, Nannan Zhang, Wenlong Liu, Wenjun Cai, Yun Xu, Xiang Wu, Shibo Wang, Han Zhang,* Shun Li* and Xiangdong Kong*



15617

Photoluminescence fluctuations in single perovskite nanocrystals: structural, environmental and ligand effect

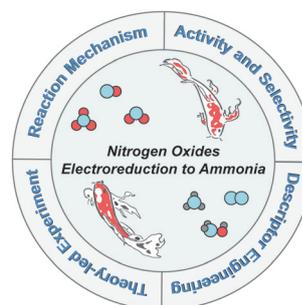
Hawi N. Nyiera and Jing Zhao*



15628

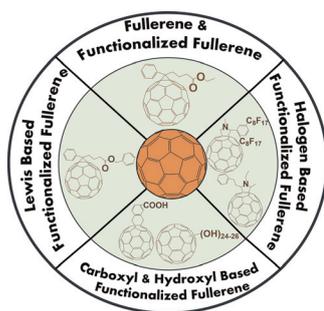
Mechanistic insights and rational catalyst design in NO_x electroreduction

Xue-Chun Jiang, Jian-Wen Zhao and Jin-Xun Liu*



MINIREVIEWS

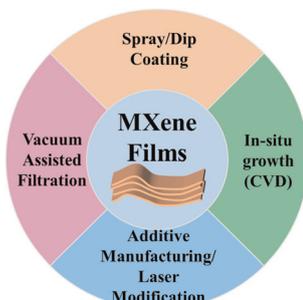
15648



Fullerene-driven photocarrier processes in perovskite solar cells: recent advances

Muhammad Waqas, Dhruva B. Khadka,* Abdul Haseeb Hassan Khan and Ying-Chiao Wang*

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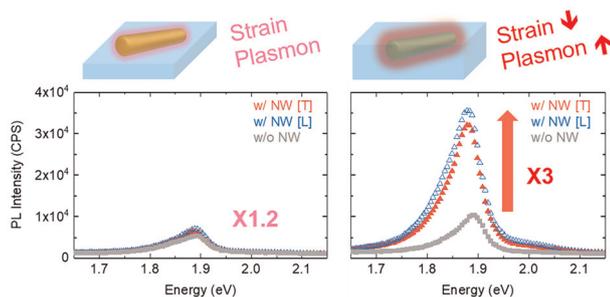


Fabrication of MXene films through various techniques: a mini review

Kaiting Wang, Iftikhar Hussain,* Karanpal Singh and Kaili Zhang*

COMMUNICATION

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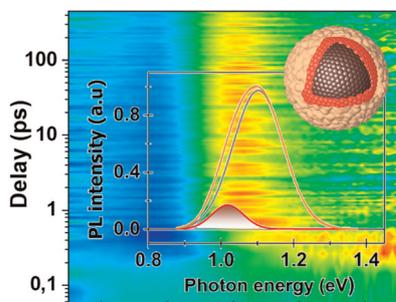


Optimized plasmonic enhancement and deformation reduction in MoS₂ monolayers using Au-nanowire-embedded polymers

Nahyun Kim, Jungeun Song, Jungyoon Cho, Anh Thi Nguyen, Seawoo Moon, Ambrose Seo and Dong-Wook Kim*

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Exploring many-body phenomena: biexciton generation and auger recombination in Ag₂S-based nanocrystals

Victor Vega-Mayoral,* Saül Garcia-Orrit, Peijiang Wang, Rafael Morales-Márquez, Emma Martín Rodríguez, Beatriz H. Juárez* and Juan Cabanillas-Gonzalez

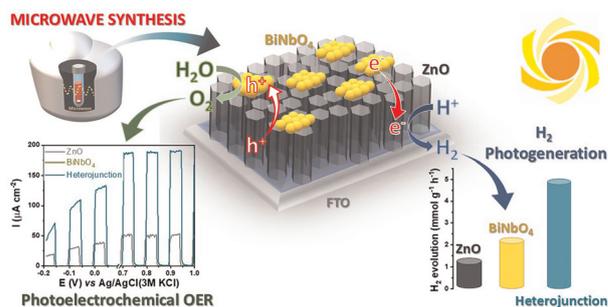


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Microwave-assisted synthesis of ZnO/BiNbO₄ heterojunctions for enhanced hydrogen production

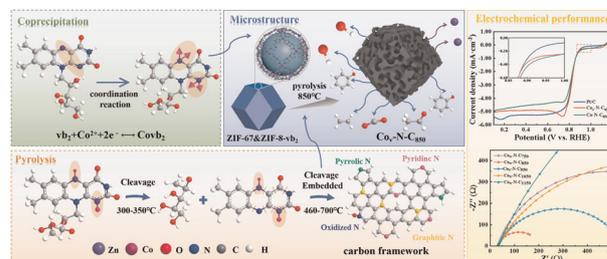
Maria Kuznetsova, Priscila Hasse Palharim, Caroline Helena Claudino, José Javier Sáez Acuña, Karina P. M. Frin, Christophe Colbeau-Justin, Hynd Remita and Juliana dos Santos de Souza*



15720

Abundant active-site engineering enables porous Co–N–C electrocatalysts towards superior oxygen reduction reaction activity

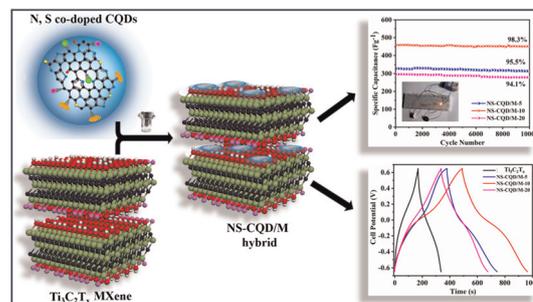
Yue Zhang, Zexuan Du, Huaping Mei, Bingye Song,* Qianzhi Gou,* Xiaolin Hu,* Di Qi, Ran Gao and Xianda Sun



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Nitrogen and sulfur co-doped carbon quantum dot-decorated Ti₃C₂T_x-MXenes as electrode materials for high-performance symmetric supercapacitors

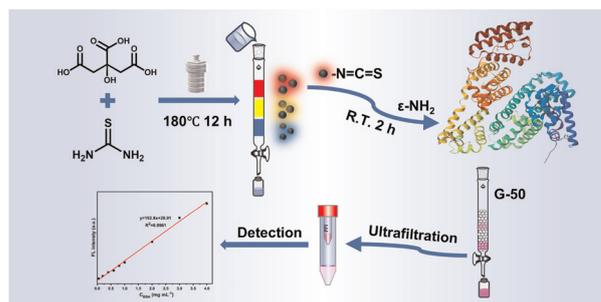
Srija Ghosh, Sumanta Bera, Arijit Kapuria, Anup Debnath, Pratyusha Das, Yan-Kuin Su and Shyamal K. Saha*



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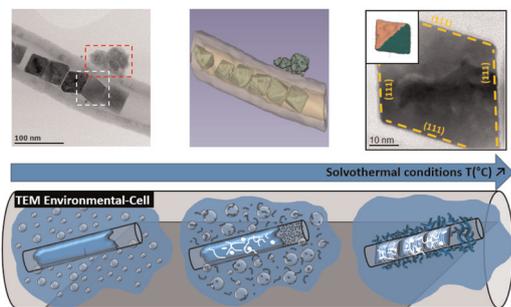
Preparing nitrogen and sulfur-codoped carbon quantum dots to achieve labeling of bovine serum albumin

Wanqing Li, Xue Chen, Xipeng Dong, Zizhuo Zhai, Yu Kang and Pudun Zhang*



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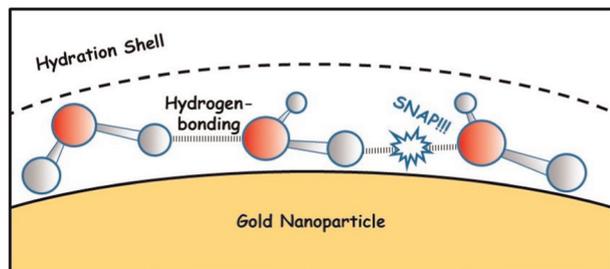
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3D and *in situ* electron microscopy studies of the nucleation and growth processes of cobalt-based nanoparticles synthesized *via* thermal decomposition on carbon nanotubes

Mohamed Alae Ait Kerroum, Dris Ihiwakrim, Ovidiu Ersen and Walid Baaziz*

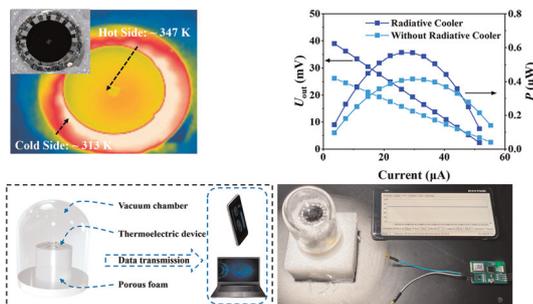
15772



Hydration shell water surrounding citrate-stabilised gold nanoparticles

Taritra Mukherjee, Elspeth K. Smith, Marialore Sulpizi* and Martin Rabe*

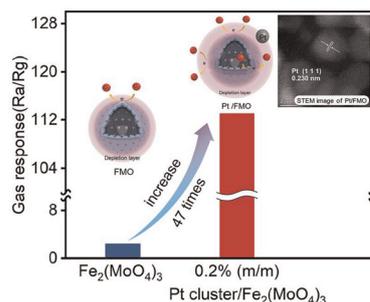
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Advancing thermoelectric and sensing performance in constrained GeTe thin films

Xiaoyu Sun, Shuaihang Hou, Zuoxu Wu, Jian Wang, Zunqian Tang, Xingjun Liu, Jun Mao, Qian Zhang* and Feng Cao*

15794



Pt atomic cluster-decorated $\text{Fe}_2(\text{MoO}_4)_3$ hollow microspheres for detecting sub-parts-per-million xylene prepared by the atomic layer deposition method

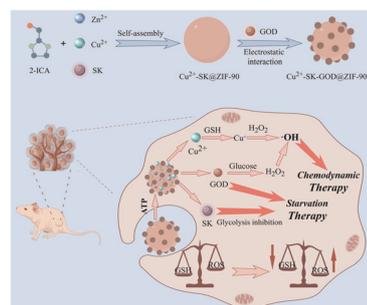
Zhuoyuan Wang, Jiaye Qiu, Jiangmei Gou, Jiangtao Wu* and Lei Zhang*



15804

ATP-responsive nanoparticles for improved chemodynamic therapy and dual starvation therapy

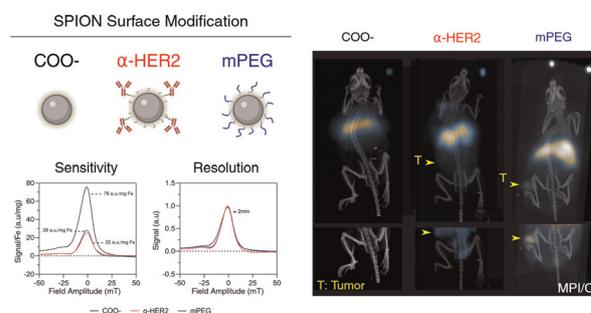
Xiao-Fan Xu, Jun-Tao Chen, Qian Song, Zhi-Qing Wang, Jia-Qin Long, Guo-Jiang Mao, Yongfei Li, Liufang Hu, Juan Ouyang* and Chun-Yan Li*



15815

Comparative evaluation of polymer coated versus antibody modified SPIONs for tumor detection using magnetic particle imaging

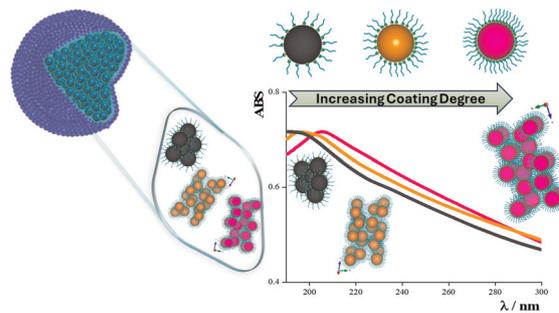
Jurie Tashkandi, Robert Brkljača, Marie Zhang, Christoph E. Hagemeyer and Karen Alt*



15829

Impact of solvent and ligand density on the self-assembly and optical properties of metal nanocrystals

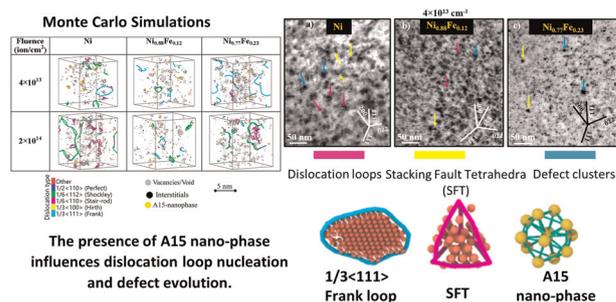
Alessandro Cangiano, Noemi Gallucci, Antonella Giarra, Junaid Ali, Leonardo Chiappisi, Nathan P. Cowieson and Luigi Paduano*



15841

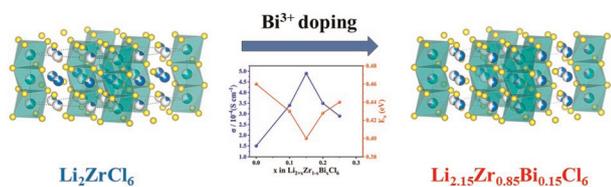
Nanoscale defect formation in fcc Ni and low-Fe content Ni_xFe_{1-x} single crystals induced by self-ion irradiation

Edyta Wyszowska*, Cyprian Mieszczynski, Amil Aligayev, Alexander Azarov, Witold Chromiński, Damian Kalita, Anna Kosińska, Francisco Javier Dominguez-Gutierrez, Łukasz Kurpaska, Iwona Józwick and Jacek Jagielski



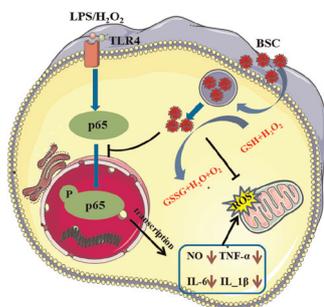
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15856

Soft acid Bi^{3+} doping in Li_2ZrCl_6 to enhance ionic conductivity and electrochemical stability

Pengfei Du, Peng Zhang, Zhenyang Shen, Yongmei Zhou, Ying Liu* and Qingtao Wang*

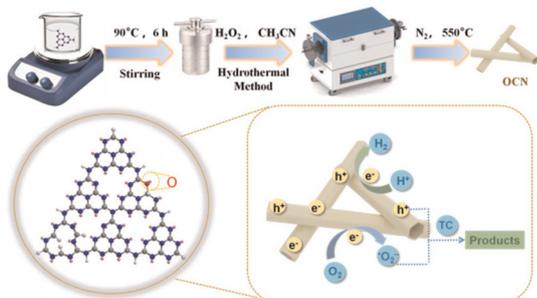
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Selenium nanoparticles combined with calycosin treated sepsis through synergistic anti-inflammatory and antioxidant effects

Bin Lu, Kun Zhang, Qingrong Dong, Lan Wei, Jia Shi, Fang Liu, Taigang Liang* and Jiangfeng Du*

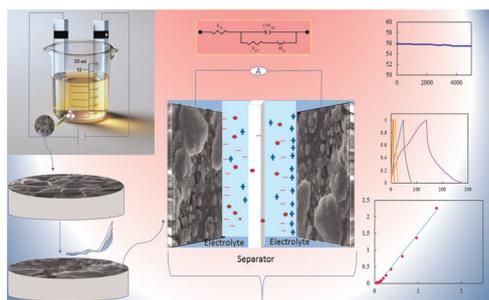
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Defect engineering synthesis of oxygen-doped carbon nitride microtubules for enhanced visible-light-driven photocatalysis

Li Zhou, Menghan Xu, Wenjie Zhang and Xiaoquan Yao*

15889



Superior pseudocapacitive performance of a nanocomposite of graphdiyne nanoflakes decorated with poly(4-chloroaniline)

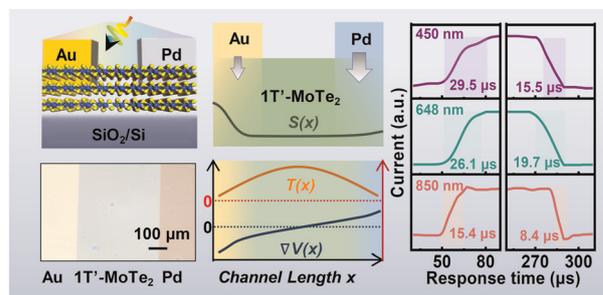
Azam Parsa, Habibollah Khajehsharifi* and Hossein Heli*



15905

Photothermoelectric effect driven self-powered broadband photodetection in $1T'$ -MoTe₂ with asymmetric electrodes

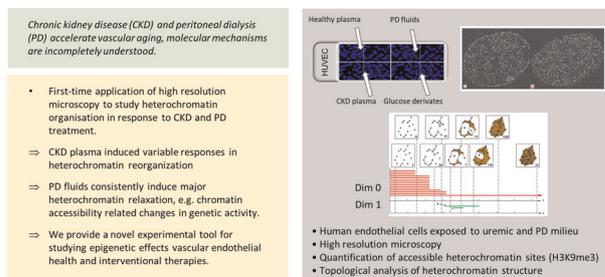
Youqi Zhang, Lan Li, YINUO Zhang,* Yifan Liu, Yunan Lin, Xutao Zhang, Yongqi Hu, Xiaoqiang Sun, Bingyan Ai and Yi Pan*



15914

Spatial nano-scaled organization of heterochromatin in nuclei of endothelial cells after exposure to uremic and dialytic milieu

Maria Bartosova Medvid,* Arslan Saleem, Myriam Schäfer, Gesine Messerschmidt, Claus Peter Schmitt and Michael Hausmann

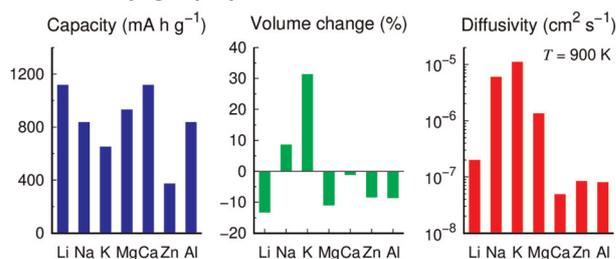


15924

Holey graphyne anode for metal-ion batteries: suitability for potassium-ion batteries

Taegon Jeon, Young Chul Lee and Sung Chul Jung*

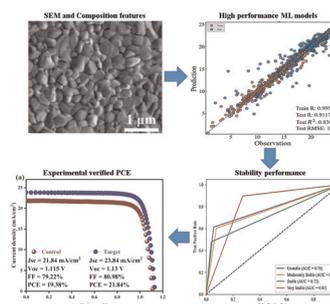
Holey graphyne for metal-ion batteries



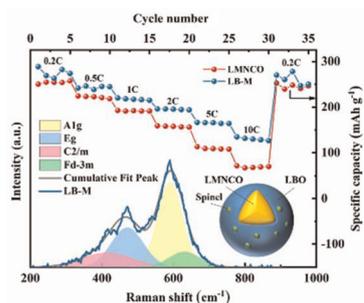
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Enhancing perovskite solar cell efficiency and stability: a multimodal prediction approach integrating microstructure, composition, and processing technology

Wajeeha Rahman, Chengquan Zhong, Haotian Liu, Jingzi Zhang,* Jiakai Liu,* Kailong Hu* and Xi Lin*



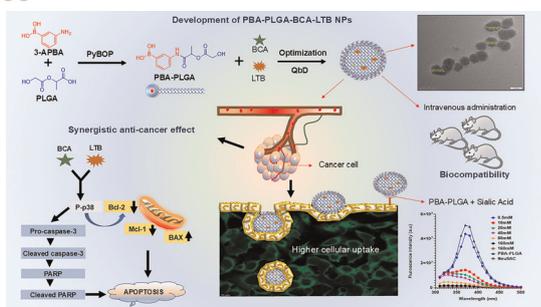
15950



Mn-based Li-rich layered oxides obtained by double-surface modification engineering as high performance cathode materials for lithium-ion batteries

Yanpeng Liu, Yan Zhang, Hongjie Tan, Yawei Zhao, Haiyang Wu, Zhe Liu, Yanping Liu, Shuangyan Meng and Shanglong Peng*

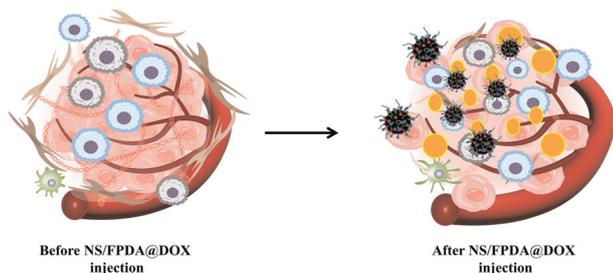
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Development of phenylboronic acid functionalized poly (lactic-co-glycolic acid) nanoparticles for novel co-delivery of chemo-herbal combination towards lung cancer: an *in silico* and *in vitro* proof of concept

Ankaj Kumar, Anshu Gupta, Anurag Saini, Sudhagar Selvaraju, Kalyan Kumar Sethi and Arvind Gulbake*

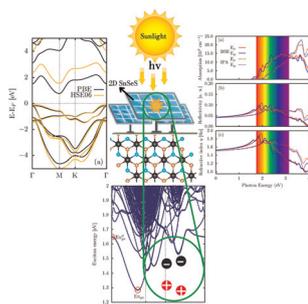
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Environment-responsive polydopamine nanoparticle cross-linked phenylboronic-grafted hyaluronic acid with enzyme-like properties for tumor synergistic therapy

Qing Ji, Mengya Zhu, Xinyuan Li, Wenxiao Cheng and Zhengzhou Fang*

16003



2D Janus SnSeS monolayers for solar energy conversion: insights from DFT and excitonic analysis

Bill D. Aparicio-Huacarpuma, Enésio Marinho, Jr, William F. Giozza, Alysson M. A. Silva, C. Kenfack-Sadem, Alexandre C. Dias* and Luiz A. Ribeiro, Jr

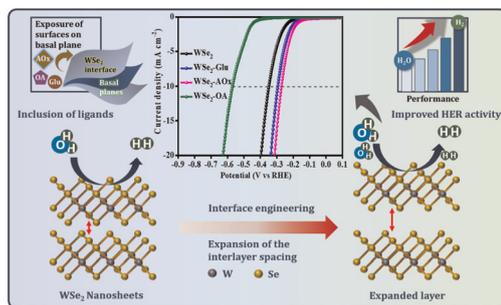


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16012

Interfacial engineering and electronic structure modulation of two-dimensional WSe₂ towards improved electrocatalytic hydrogen evolution

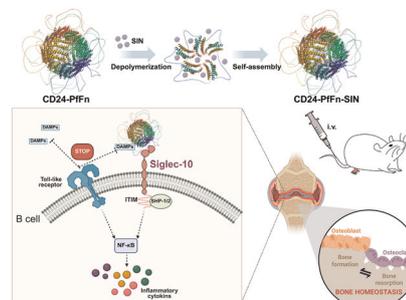
Hrudeswar Mohanty and Sellappan Senthilkumar*



16025

Targeted delivery of sinomenine hydrochloride using recombinant ferritin nanocages for rheumatoid arthritis treatment

Yunzhen Gao, Na Jia, Yi Liang, Yani Xu, Rongying Shi, Jiaying Long, Qing Lin, Zhirong Zhang, Ling Zhang* and Shiqi Huang*



CORRECTION

16039

Correction: A green carbon dot@silver nanoparticle hybrid: as a turn-on fluorescent probe for the detection and quantification of cholesterol and glucose

Nasrin Rahmatian, Shahryar Abbasi,* Naser Abbasi and Mohammad Tavakkoli Yaraki*

