

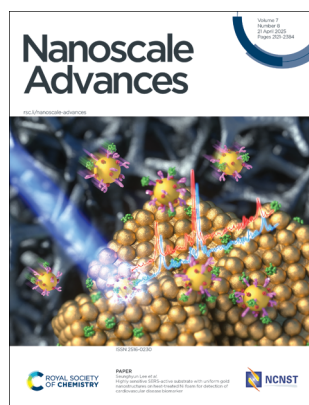
Nanoscale Advances

An open access journal publishing across the breadth of nanoscience and nanotechnology
rsc.li/nanoscale-advances

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2516-0230 CODEN NAADAI 7(8) 2121–2384 (2025)



Cover

See Seunghyun Lee *et al.*,
pp. 2171–2181. Image
reproduced by permission of
Seunghyun Lee from
Nanoscale Adv., 2025, 7, 2171.

REVIEW

2131

A comprehensive review on nano-fertilizers: preparation, development, utilization, and prospects for sustainable agriculture in Ethiopia

Eyasu Derbew Demeke, Natei Ermias Benti, Mintesnot Gizaw Terefe, Teshome Taye Anbessa, Wondimagegne Mamo Mengistu* and Yedilfana Setarge Mekonnen*

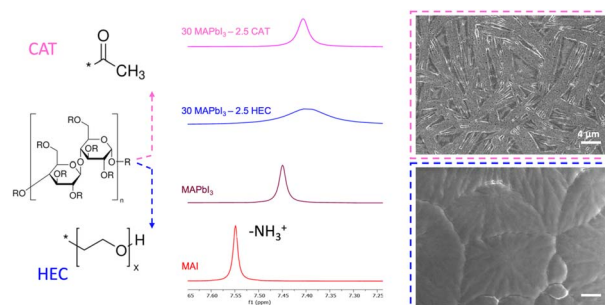


COMMUNICATIONS

2145

Inclusion of polysaccharides in perovskite thin films: from in-solution interaction to film formation and stability

Francesco Bisconti, Antonella Giuri,* Nadir Vanni, Sonia Carallo, Silvia Spera, Rosamaria Marrazzo, Riccardo Po', Paolo Biagini, Barbara Paci, Amanda Generosi, Marco Guaragno, Carola Esposito Corcione, Andrea Listorti, Silvia Colella and Aurora Rizzo*



EES Batteries

**Exceptional research on
batteries and energy storage**

Part of the EES family

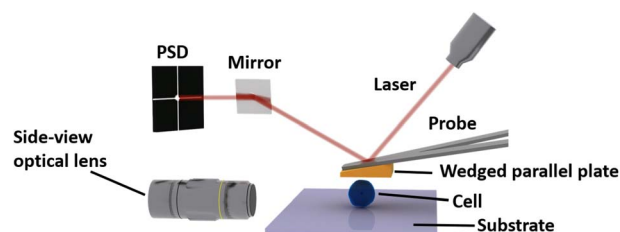
**Join
in** | Publish with us
rsc.li/EESBatteries

COMMUNICATIONS

2158

Single-cell parallel plate mechanics by side-view optical microscopy-assisted atomic force microscopy

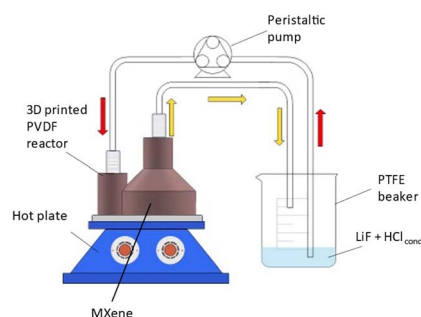
Mingyang Yang, Yanqi Yang, Lianqing Liu and Mi Li*



2166

MXene synthesis in a semi-continuous 3D-printed PVDF flow reactor

Molly J. Clark, Alice E. Oakley, Nikolay Zhelev, Marina Carravetta, Thomas Byrne, Adrian M. Nightingale* and Nuno Bimbo*

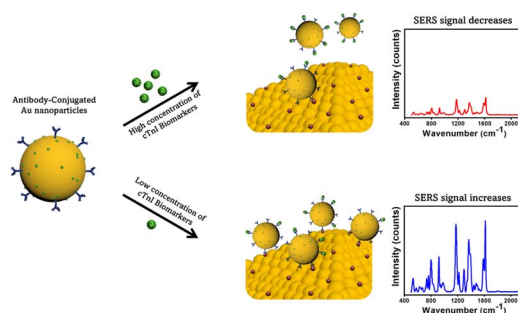


PAPERS

2171

Highly sensitive SERS-active substrate with uniform gold nanostructures on heat-treated Ni foam for detection of cardiovascular disease biomarker

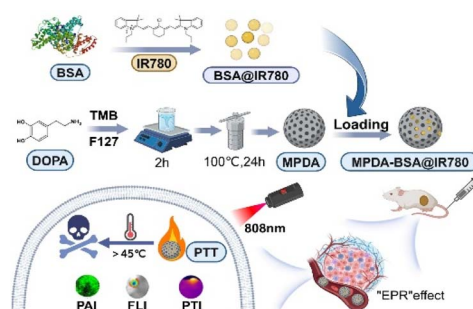
Sunghoon Yoo, Jaejun Park, Dong Hwan Nam, Sumin Kim, Dongtak Jeong, Moon-Keun Lee and Seunghyun Lee*



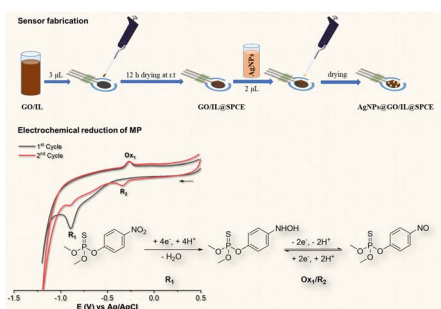
2182

BSA@IR780-loaded mesoporous polydopamine nanoparticles with enhanced photostability for multimodal imaging and photothermal therapy of tumors

Shuaibo Yang, Yanzhao Diao, Lifeng Hang, Hong Qu, Laiping Fang, Wei Guo, Hua Wen, KuokWai lu, Guihua Jiang,* Lianyi Shao* and Quan Li*



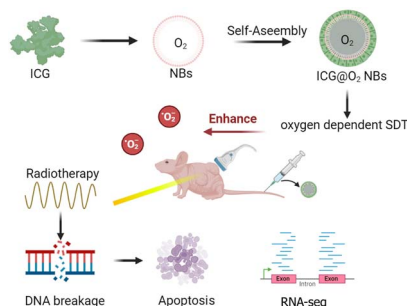
2195



Enhanced electrochemical sensing of methyl parathion using AgNPs@IL/GO nanocomposites in aqueous matrices

Saddam Weheabby,* Ziyuan Liu, Igor A. Pašti, Vladimir Rajić, Marcio Vidotti and Olfa Kanoun

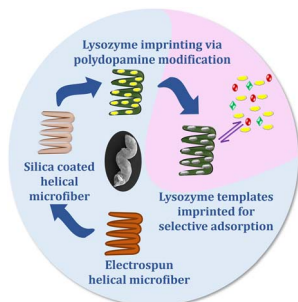
2209



Ultrasound-activated nano-oxygen sensitizer for sonodynamic–radiotherapy of esophageal cancer

Jiayin Liu, Manru Shi, Huijia Zhao, Xin Bai, Quan Lin, Xin Guan, Bolin Wu* and Mingyan E.*

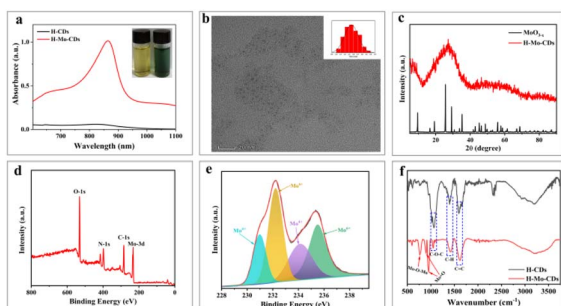
2222



Surface imprinted microhelical magnetic polymer nanocomposite fibers for targeted lysozyme separation

Aakanksha Mohan and Sutapa Roy Ramanan*

2231



A Mo-doped carbon dot nanozyme for enhanced phototherapy *in vitro*

Wenlong Wang, Xuan Sheng, Yihan Wang, Mingjun Yu, Yue Shen, Youfu Xia, Tiao Li, Shuai Cao, Mengjuan Zhang, Wenjian Wang* and Yongjian Yang*

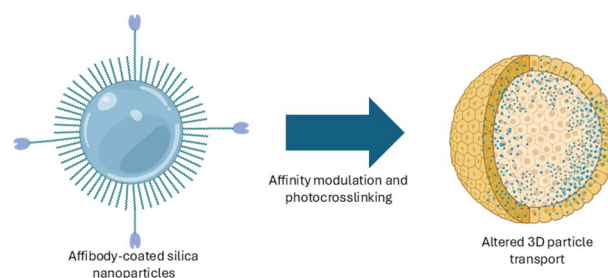


PAPERS

2239

Binding affinity and transport studies of engineered photocrosslinkable affibody-enzyme-nanoparticle constructs

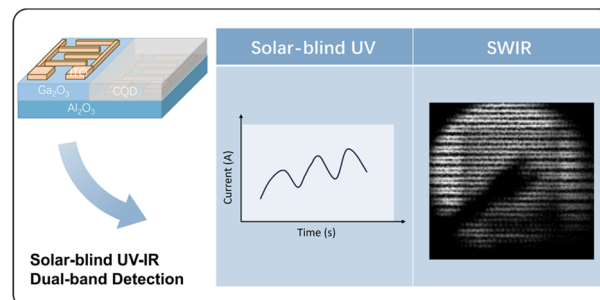
Shane D. Curry, Bryce M. Bower, Sven A. Saemundsson, Andrew P. Goodwin* and Jennifer N. Cha*



2248

An ultra-violet and infrared dual-band photodetector using a Ga_2O_3 thin film and HgTe colloidal quantum dots

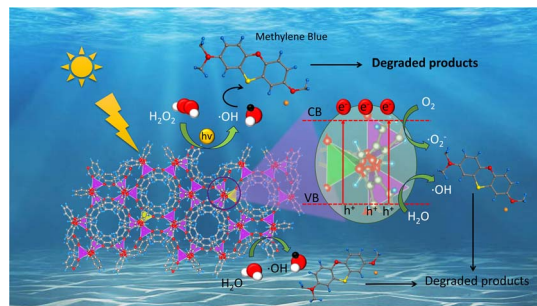
Qiqi Zheng, Yu Yang, Liansheng Li, Qing-An Xu, Kenan Zhang, Xiaomeng Xue, Lisha Ma, Jianhao Yu, Wanjun Li* and Menglu Chen*



2255

Engineering a multivariate cobalt metal–organic framework for high photocatalytic activity: the impact of mixed ligands and metal incorporation in a visible light-driven heterogeneous photo-Fenton reaction for water treatment

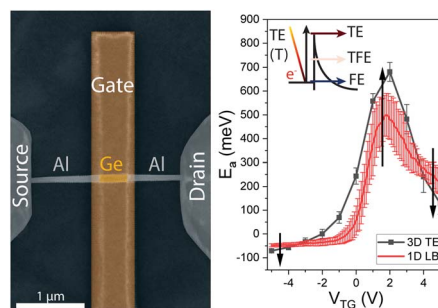
Noelia Rodríguez-Sánchez, Biswajit Bhattacharya, Franziska Emmerling, Carsten Prinz, Paula Prieto-Laria, A. Rabdel Ruiz-Salvador* and Menta Ballesteros*



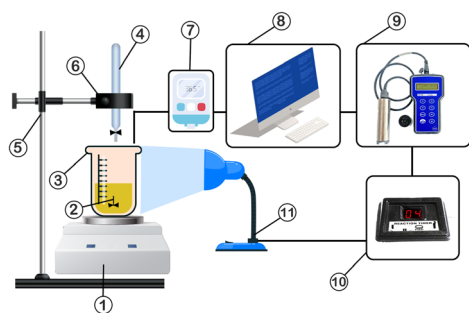
2266

Thermionic injection analysis in germanium nanowire Schottky junction FETs by means of 1D and 3D extraction methods

Raphael Behrle, Aníbal Pacheco-Sanchez, Sven Barth, Walter M. Weber and Masiar Sistani*



2272



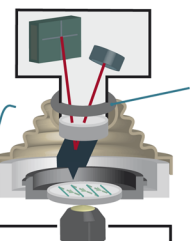
Crystallization of neomycin nanoparticles in the presence of polyvinyl pyrrolidone (PVP)

Sirous Motahari, Abdolmohammad Alamdari and M. Reza Malayeri*

2290

Design concept
hermetically closed
sample chamber

I. Sealed independent
unit including
cantilever holder



II. Membrane support
structure system

III. Two-level
flexibility of
membrane

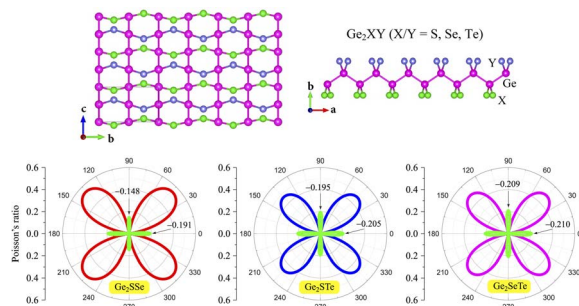
- ✓ biosafety requirements
- ✓ correlated optical and AFM

time-lapse nano-characterization
of pathogenic microorganisms in-vitro

A hermetically closed sample chamber enables time-lapse nano-characterization of pathogenic microorganisms *in vitro*

Esther Braun, Santiago H. Andany, Mustafa Kangül, Navid S. Asmari, John D. McKinney and Georg E. Fantner*

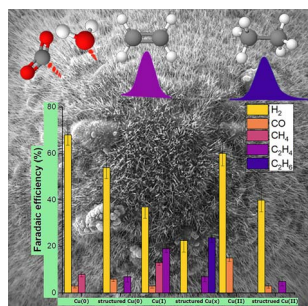
2301



Novel auxetic semiconductors with high carrier mobility: first principles prediction of Janus Ge_2XY ($\text{X/Y} = \text{S, Se, Te}$) monolayers

Vo Q. Nha, Nguyen Q. San, Huynh T. T. Linh, Tuan V. Vu and Nguyen D. Hien*

2309



Unraveling the roles of pressure, oxidation state, and morphology in CO_2 electroreduction to C_{2+} gaseous products over copper oxides

Asghar Ali and Ali S. Alnaser*



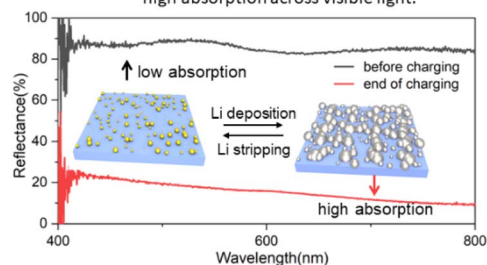
PAPERS

2322

A dynamic broadband plasmonic absorber enabled by electrochemical lithium metal batteries

Huiling Yu*

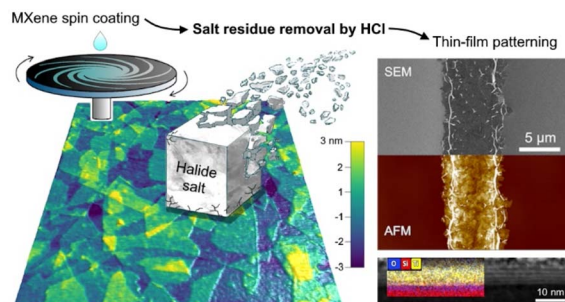
The dynamic broadband absorber based on Li metal batteries achieves high absorption across visible light.



2329

Without a grain of salt: micropatterning clean MXene thin-film electronics

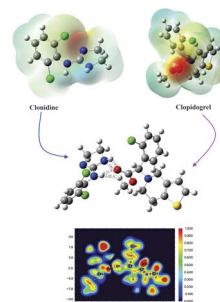
Bar Favelukis, Barak Ratzker, Rebeca Miyar, Jürgen Jopp, Alexander Upcher, Pini Shekhter, Nitzan Maman and Maxim Sokol*



2338

Study of clopidogrel and clonidine interactions for cardiovascular formulations: progress from DFT modeling

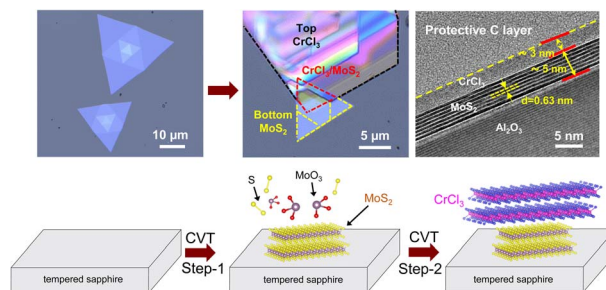
B. Ocampo Cárdenas,* G. Román, E. Nosedá Grau and S. Simonetti



2351

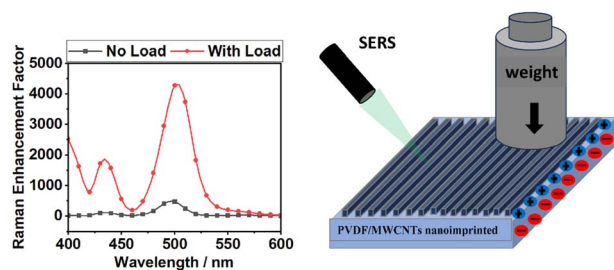
Novel synthesis approach for highly crystalline CrCl₃/MoS₂ van der Waals heterostructures unaffected by strain

Mahmoud M. Hammo,* Samuel Froeschke, Golam Haider, Daniel Wolf, Alexey Popov, Bernd Büchner, Michael Mertig and Silke Hampel



PAPERS

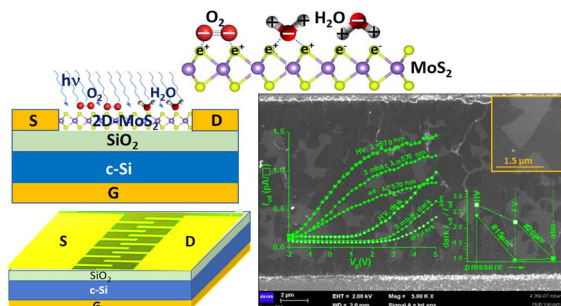
2360



Flexible nanoimprinted substrate integrating piezoelectric potential and photonic-plasmonic resonances

Aeshah F. Alotaibi,^{*} Rongcheng Gan, Eni Kume, Dominik Duleba, Ahmed Alanazi, Allan Finlay, Robert P. Johnson and James H. Rice^{*}

2368



Effect of molecular adsorption on the conductivity of selectively grown, interconnected 2D-MoS₂ atomically thin flake structures

Ionel Stavarache,^{*} Catalin Palade, Adrian Slav, Ioana Dascalescu, Ana-Maria Lepadatu, Elena Matei, Cristina Besleaga, Magdalena Lidia Ciurea, Beata E. Kardynal^{*} and Toma Stoica^{*}

CORRECTION

2381

Correction: Analyzing the charge contributions of metal–organic framework derived nanosized cobalt nitride/carbon composites in asymmetrical supercapacitors

Vishal Shrivastav,^{*} Mansi, Prashant Dubey, Umesh K. Tiwari, Akash Deep, Wojciech Nogala^{*} and Shashank Sundriyal^{*}

