

Materials Advances

An open access journal publishing across the breadth of materials science

rsc.li/materials-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 2633-5409 CODEN MAADC9 6(1) 1-466 (2025)



Cover

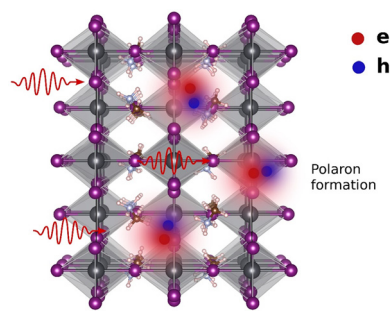
See Magali Gary-Bobo, José A. Pomposo, Fabienne Dumoulin *et al.*, pp. 148–156. Image reproduced by permission of Davide Arena from *Mater. Adv.*, 2025, 6, 148.

REVIEWS

13

Exciton binding energies and polaron interplay in the optically excited state of organic–inorganic lead halide perovskites

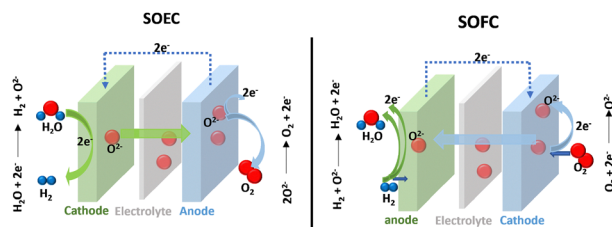
Zeeshan Muhammad* and Arooj Rashid



39

Highly conductive and stable electrolytes for solid oxide electrolysis and fuel cells: fabrication, characterisation, recent progress and challenges

Jing Li, Qiong Cai and Bahman Amini Horri*



Environmental Science: Atmospheres

GOLD
OPEN
ACCESS

Connecting communities and inspiring new ideas

Open Access Article. Published on 03 January 2025. Downloaded on 4/11/2026 1:14:31 AM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

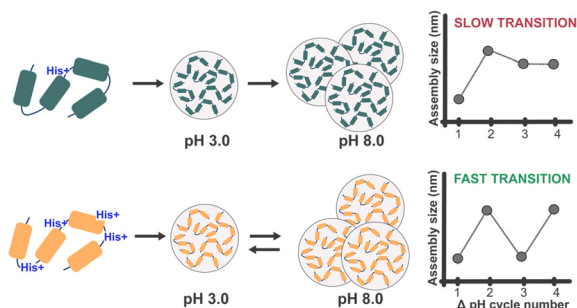


rsc.li/submittoEA

Fundamental questions
Elemental answers



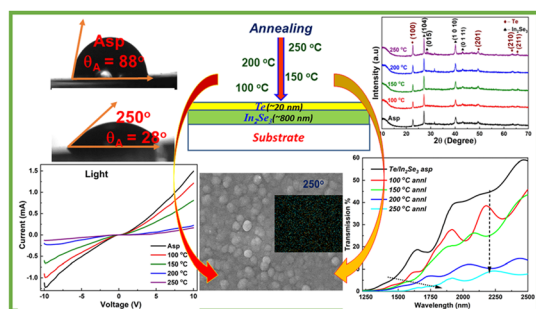
157



Kinetics of charge-dependent reversible condensation of reflectin nanostructures

Iana Lychko, Cátia Lopes Soares, Arménio Jorge Moura Barbosa, Tomás Rosa Calmeiro, Rodrigo Ferrão de Paiva Martins, Ana Margarida Gonçalves Carvalho Dias* and Ana Cecília Afonso Roque*

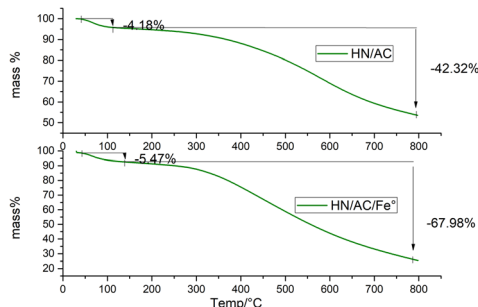
168



Improvement of hydrophilicity and optical nonlinearity in a Te/In₂Se₃ bilayer heterostructure film by annealing at different temperatures for optoelectronic applications

S. Supriya, S. Das, D. Alagarasan and R. Naik*

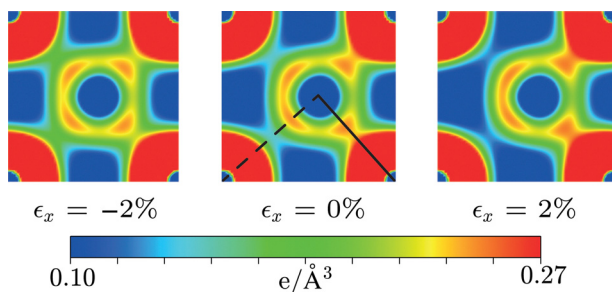
184



Green synthesis and physicochemical characterization of an eco-friendly zero-valent iron biochar based on *Coula edulis* shell and morinda bark extracts using response surface analysis

C. A. Ntinkam Simo, J. M. Dika and C. M. Kede*

196



Origin and enhancement of the piezoelectricity in monolayer group IV monochalcogenides under strain and in the presence of vacancies

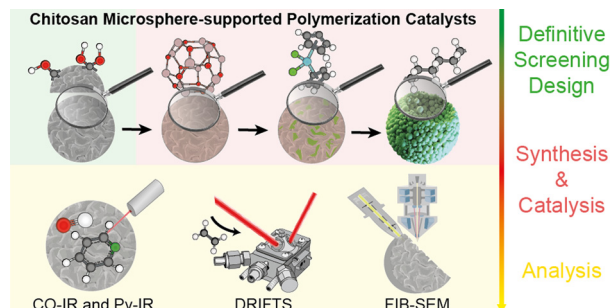
Arun Jangir, Duc Tam Ho and Udo Schwingenschlöggl*



201

Chitosan microsphere-supported catalysts: design, synthesis and optimization for ethylene polymerization

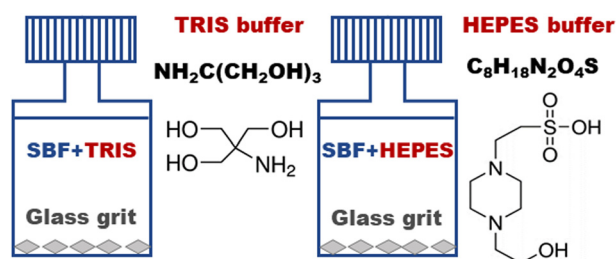
Joren M. Dorresteijn, Robin Conradi, Laurens D. B. Mandemaker, Kordula Schnabl, Virginie Cirriez, Alexandre Welle, Daniel Curulla-Ferré, Florian Meirer, Eelco T. C. Vogt and Bert M. Weckhuysen*



214

Monitoring of the dissolution/precipitation behavior of bioglass with simulated body fluid buffered by HEPES

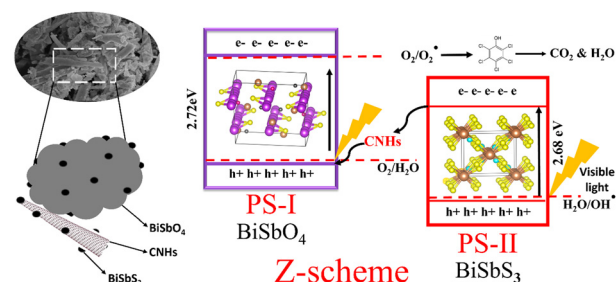
Diana Horkavcová,* Eliška Sedláčková, Petr Bezdička, Miloslav Lhotka, Karolína Pánová and Aleš Helebrant



224

Synthesis of a $\text{BiSbS}_3@/\text{BiSbO}_4/\text{CNH}$ nanocomposite for wastewater treatment and electrochemical application

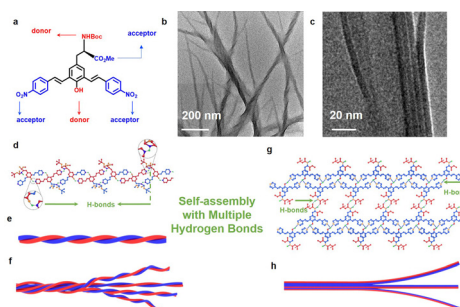
Maria Batool and Muhammad Nadeem Zafar*



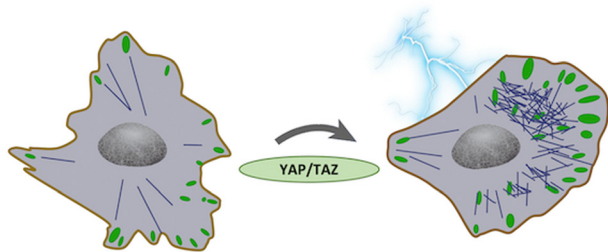
241

Programmed self-assembly of conjugated oligomer-based helical nanofibres through hydrogen bonding interactions

Yu Wang, Guoxin Yin, Pradeep Cheraku, Yu Xia, Yuping Yuan, Peng Miao, Huidong Zang, Mircea Cotlet,* Ping Xu* and Hsing-Lin Wang*



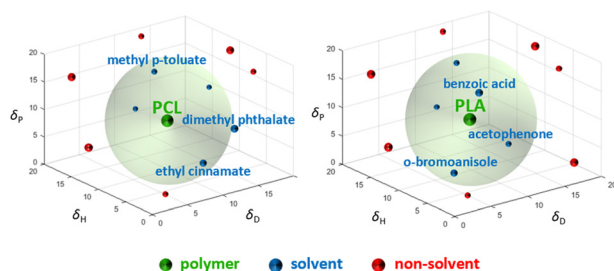
248



YAP/TAZ cytoskeletal remodelling is driven by mechanotactic and electrotactic cues

Bernadette Basilio, Maddalena Grieco, Stefania D'Amone, Ilaria Elena Palamà, Clotilde Lauro, Pamela Mozetic, Alberto Rainer, Simone de Panfilis, Valeria de Turris, Giuseppe Gigli and Barbara Cortese*

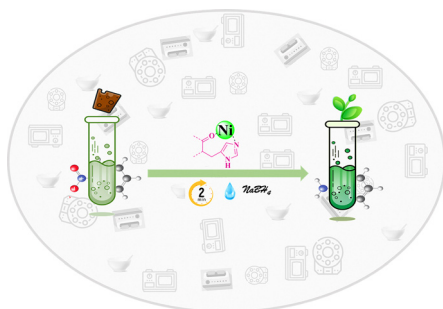
263



Finding low-toxicity biopolymer solvents with high melting temperature and thermally induced phase separation of poly(ϵ -caprolactone)

Patrik Boura, Lenka Krajkova, Adam Bouz, Silvestr Figalla, Alexandr Zubov, Bart Van der Bruggen and Juraj Kosek*

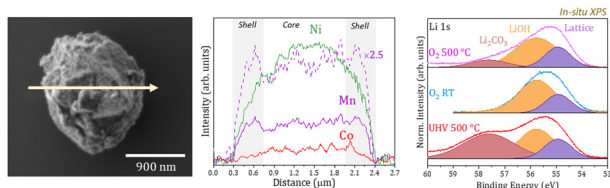
278



Unveiling the impact of the mpg-C₃N₄@Pa@Ni nanocomposite in the reduction of nitroaromatic derivatives by comparative solvent-free methods

Fatemeh Eshrati, Hossein Ghafuri,* Peyman Hanifehnejad and Haniyeh Dogari

298



Synthesis and characterization of core-shell NMC microparticles as cathode materials for Li-ion batteries: insights from *ex situ* and *in situ* microscopy and spectroscopy techniques

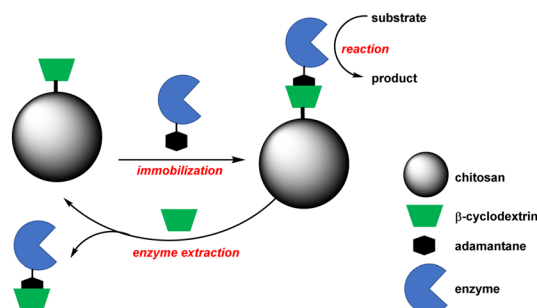
J. García-Alonso, S. Krüger, K. Kelm, E. Guney, N. Yuca, I. J. Villar-García, B. Saruhan, V. Pérez-Dieste, D. Maestre* and B. Méndez



311

Use of supramolecular chemistry based on β -cyclodextrin-grafted chitosan beads to prepare green biocatalytic materials

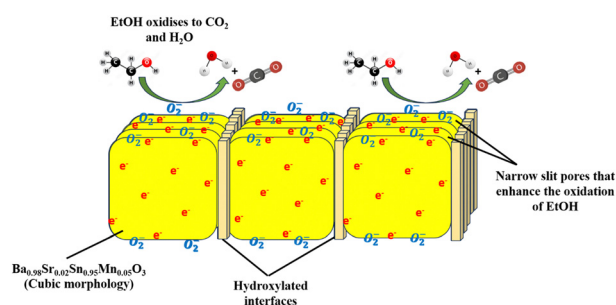
Agatha Bastida,* Leoncio Garrido and Alfonso Fernández-Mayoralas*



319

Nanocrystalline and mesoporous $(\text{Ba,Sr})(\text{Sn,Mn})\text{O}_3$ perovskite solid solution: a potential n-type semiconductor for room temperature ethanol sensing applications

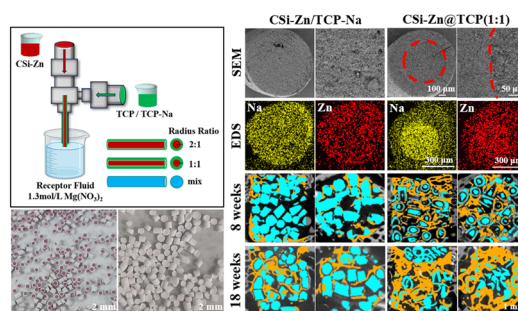
Nehal Ashok Waghchoure and Kampurath Poduvattil Jayadevan*



331

Doping functional ions in phase-stabilizing core-shell biphasic granules readily tunes bone regeneration *in situ*

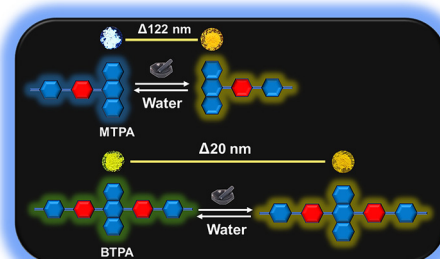
Yan Xu, Jian Shen, Lingling Dong, Xiaoyi Jiao, Lei Zhang, Jiaqi Yang, Shanxiang Xu, Xianyan Yang, Huiming Zhong,* Guoli Yang* and Zhongru Gou*



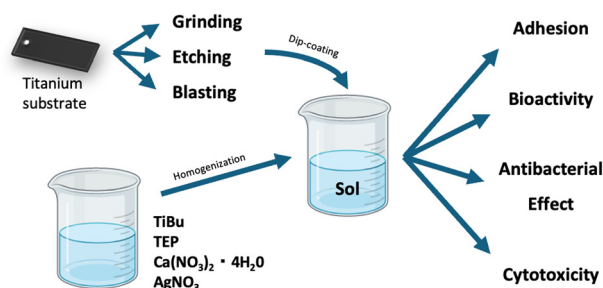
345

D-A-D type high contrast mechanochromic luminescence based on anthracene and pyridinium salt derivatives

Xianchen Hu, Zhengfen Liu, Shubiao Xiao* and Junli Yang*



352



Development of titania coatings containing calcium, phosphorus, and silver, applied *via* the sol-gel method and dip-coating technique

Karolína Opavová,* Diana Horkavcová, Eva Jablonská, Lucie Mrázková and Anna Bašusová

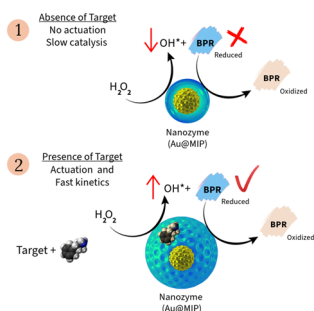
365



Self-assembling PEGylated mannolipids for liposomal drug encapsulation of natural products

Leila Mousavifar, Mukul R. Gupta, Madleen Rivat, Aly El Riz, Abdelkrim Azzouz, Jordan D. Lewicky, Alexandrine L. Martel, Hoang-Thanh Le and René Roy*

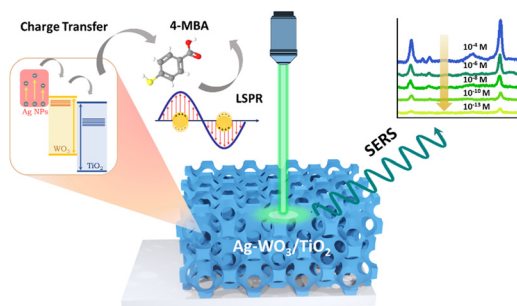
378



Generic strategy for the synthesis of highly specific Au/MIP nanozymes and their application in homogeneous assays

Shaema Hadi Abdulsada, Alvaro Garcia Cruz,* Christopher Zaleski, Elena Piletska, Damla Ulker, Stanislav Piletsky and Sergey A. Piletsky

388



Interplay of plasmonic and charge transfer effects for ultrasensitive Ag-WO₃/TiO₂ photonic crystal SERS sensors

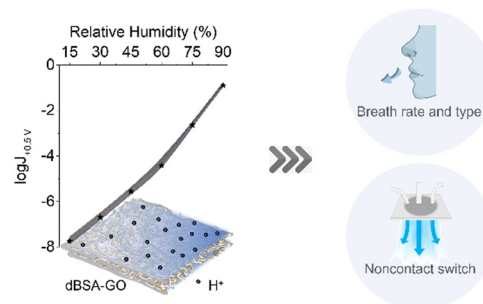
Maria-Athina Apostolaki, Elias Sakellis, Spiros Gardelis and Vlassis Likodimos*



400

Denatured bovine serum albumin particle decorated graphene oxide nanocomposite for ultrasensitive resistive humidity sensing

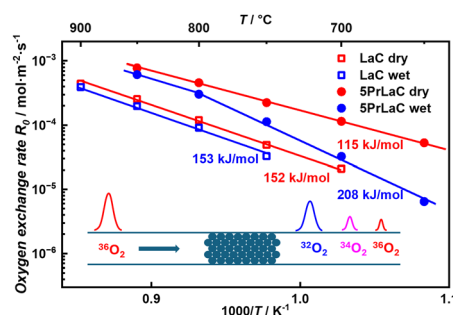
Pan Qi, Yongkang Zhang, Ziang Zhang, Xiaobing Li and Cunlan Guo*



409

Unravelling the oxygen exchange mechanism on $\text{La}_2\text{Ce}_2\text{O}_7$

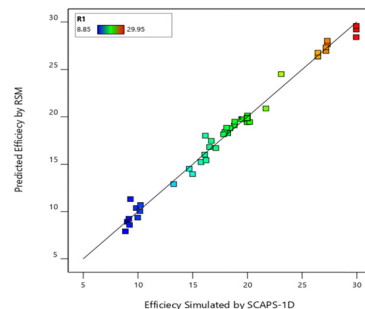
Yizhou Shen, Vincent Thor eton and Reidar Haugrud*



423

Unlocking the full potential of solar cell materials: parameter sensitivity analysis and optimization using response surface modelling

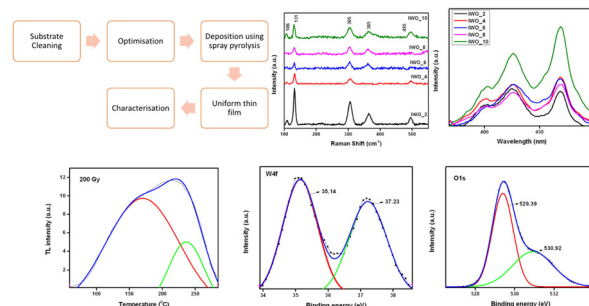
Manoj Kumar*, Sanju Rani, Xu Wang* and Vidya Nand Singh*



433

Tuning of the structural and electrical properties of thermo-luminescent tungsten-doped indium oxide thin film

Aparna C., Pramoda Kumara Shetty* and Mahesha M. G.



PAPERS

448

**Nickel-free porous stainless-steel nanocomposites for versatile biomedical applications: fabrication, characterization, and evaluation of electrochemical and immunogenicity detection**

Sabreen Abdallah Abdelwahab, Mohamad Warda, Mamdouh Zewaid, Hisham Saleh, Omar A. Ahmed-Farid, Hassan A. M. Hendawy, Elbadawy A. Kamoun,* Amr Negm, Jong Yeog Son* and Ahmed I. Ali*

CORRECTION

463

Correction: Arylselanyl motifs in hierarchically structured mesoporous phenolic polymers: efficient adsorption sites for Hg²⁺ ions

Vishnu Selladurai and Selvakumar Karuthapandi*

