

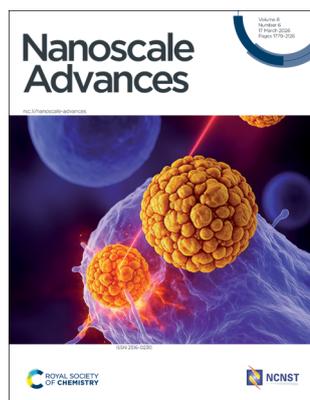
Nanoscale Advances

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 8(6) 1779–2126 (2026)



Cover

Image credit to Miguel Monge and José M. López-de-Luzuriaga, *et al.* Image reproduced by permission of Miguel Monge.

EDITORIAL

1789

Introduction to Nanoscale Advances in Innovative Bioengineering

Zhen Gu, Zhicheng Le and Zheng Su

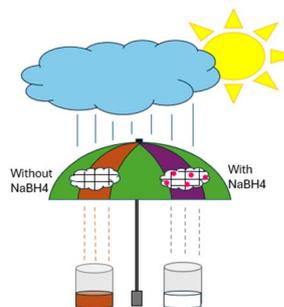


REVIEW

1791

Role of sodium borohydride as a co-catalyst for nanoparticle-induced degradation of toxic dyes in aquatic systems

Priyadarshni Nathawat, Mamta Sahu and Mainak Ganguly*



Advance your career in science

with professional recognition that showcases
your **experience, expertise and dedication**

Stand out from the crowd

Prove your commitment
to attaining excellence in
your field

Gain the recognition you deserve

Achieve a professional
qualification that inspires
confidence and trust

Unlock your career potential

Apply for our professional
registers (RSci, RSciTech)
or chartered status
(CChem, CSci, CEnv)

Apply now

rsc.li/professional-development

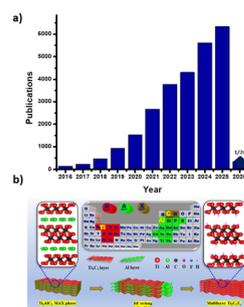


MINIREVIEW

1817

Recent advances in $Ti_3C_2T_x$ MXene-based composites for electrocatalytic applications

Minh-Hai Tran, Vo Thi Thuy Linh, Ly Tan Nhiem, Phan Khanh Thinh Nguyen* and Qui Thanh Hoai Ta*

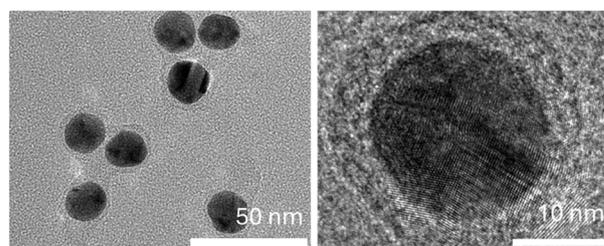


COMMUNICATIONS

1836

Green synthesis of bio-compatible carboxylate-functionalized carbon layers of 4 to 26 nm thickness on gold plasmonic nanoparticles

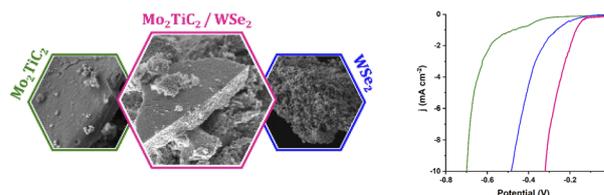
Mike Rozenberg, Avi Huri, Eli Varon, Anya Muzikansky, Orit Shefi, Eli Sloutskin and David Zitoun*



1844

 Mo_2TiC_2/WSe_2 nanoarchitectures: *in situ* grown nanoflowers for efficient hydrogen electrocatalysis

Antonia Kagkoura,* Sergii A. Sergiienko, Anastasios Papavasileiou, Jan Luxa, Zhongquan Liao and Zdeněk Sofer*

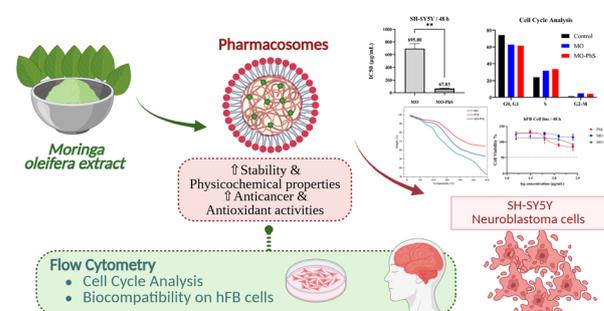


PAPERS

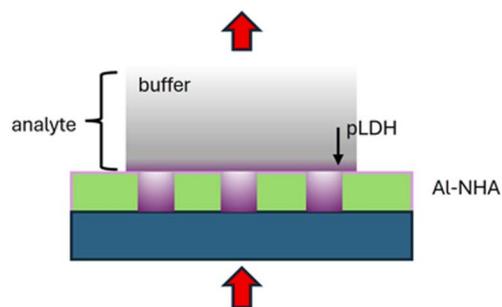
1851

Enhanced cytotoxic activity of *Moringa oleifera*-loaded pharmacosomes against neuroblastoma

Obaydah Abd Alkader Alabrahim, Ahmed Maher Abdeldayem and Hassan Mohamed El-Said Azzazy*



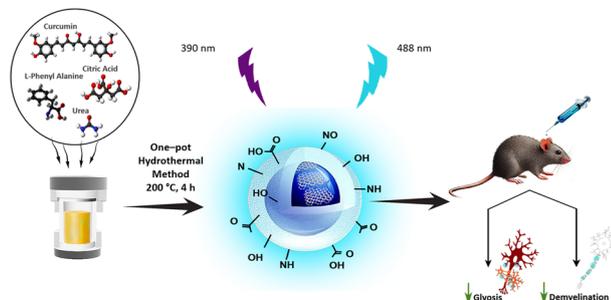
1871



Experimental plasmonic sensing of malaria using an aluminum metasurface

Amos Sospeter Kiyumbi* and Mark Simon Tame

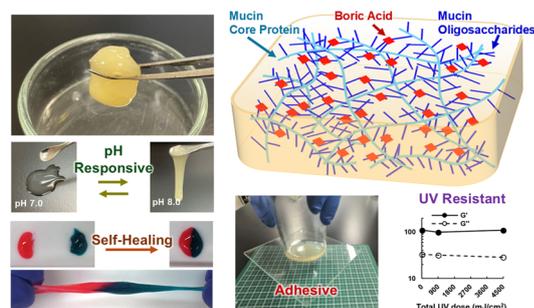
1888



Anti-inflammatory effects of curcumin carbon dots in an animal model of demyelination induced by lysolecithin

Ladan DaeiRezaei, Elham Parandavar, Mohammad Javan* and Maryam Nikkhan*

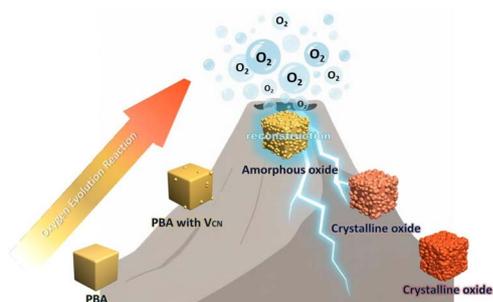
1899



Dynamic glycan network engineering of native mucin enables reversible, self-healing, and adhesive hydrogel interfaces

Yuki Nakamura, Kanta Numata, Momoka Hirosaki, Hiroki Miyajima and Satoshi Fujita*

1906



Amorphous NiFe oxide derived from an air-pyrolyzed Prussian blue analogue with rapid complete reconstruction for enhanced oxygen evolution reaction

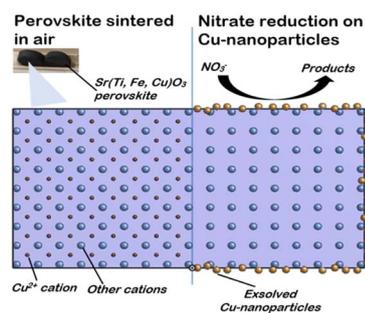
Zhen Cao, Wenhui Yan, Haozhe Shi, Tingting Zhou,* Zhifei Sun, Yuhan Yang, Jiali Zhang, Wenbin Zhang and Kaili Wang*



1916

Copper nanoparticle exsolution from Sr(Ti, Fe)O₃ perovskites: material tuning and probing (electro) catalytic applicability

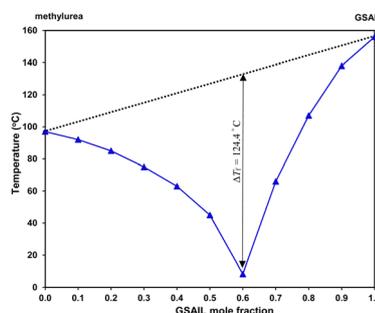
Ubong Akpan Essien, Swathi Patchaiammal Raju, Keyla Teixeira Santos, Rafael Alcides Vicente, Chinyere Adaora Ekperechukwu, Francisco R. García-García, Pablo Sebastián Fernández and Dragos Neagu*



1934

A novel molecularly engineered deep eutectic surfactant from a Gemini ionic liquid and methylurea for EOR utilization: a joint experimental and computational study

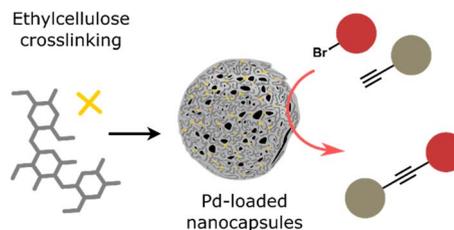
Shima Yaghoubi, Javad Saien,* Mona Kharazi, Ehsan Alavipour and Mehdi Bayat



1949

Crosslinked, organic solvent resistant ethylcellulose micro and nanocapsules for heterogeneous catalysis applications

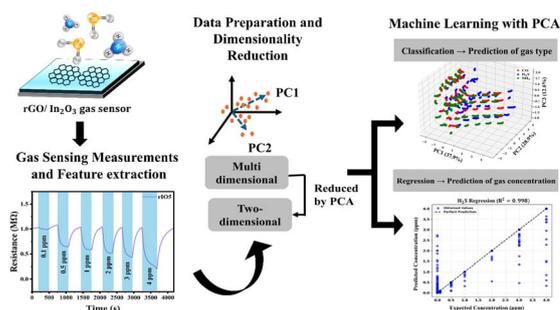
Erika Ghiglietti, Sara Mecca, Alice Fappani, Annapia Fratepietro, Sara Mattiello* and Luca Beverina*



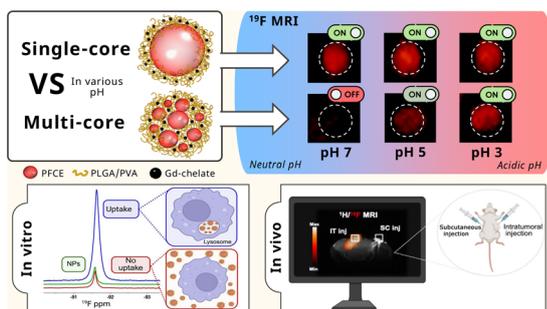
1958

Predictive mixed-gas detection using rGO/In₂O₃ nanocomposite sensors assisted by machine learning

Tanya Sood, Saikat Chattopadhyay and P. Poornesh*



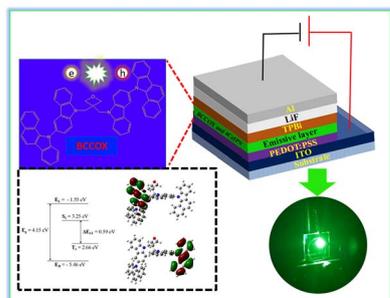
1975



Nanoparticle ultrastructure allows reversible pH sensitivity using ^{19}F NMR and *in vivo* ^{19}F MRI

Alvja Mali, Mariah Daal, Natalia Jirát-Ziótkowska, Nicolas Stumpe, Naiara Larreina Vicente, N. Koen van Riessen, Visakh V. S. Pillai, Francesco Simone Ruggeri, Cyril Cadiou, Françoise Chuburu, Daniel Jirak, Paul B. White and Mangala Srinivas*

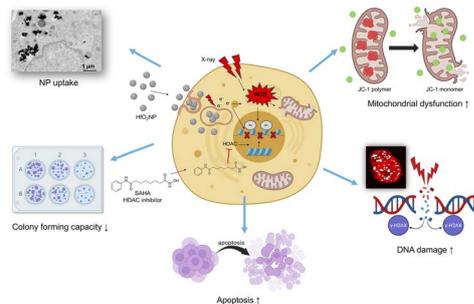
1992



Carbazole–benzocarbazole fragments having derivative as very efficient host material for TADF based OLEDs

Sushanta Lenka, Daiva Tavgeniene, Hsuan-Min Wang, Jayachandran Jayakumar, Dovydas Blazevicius, Gintare Krucaite, Yu-Lin Chi, Saulius Grigalevicius* and Jwo-Huei Jou*

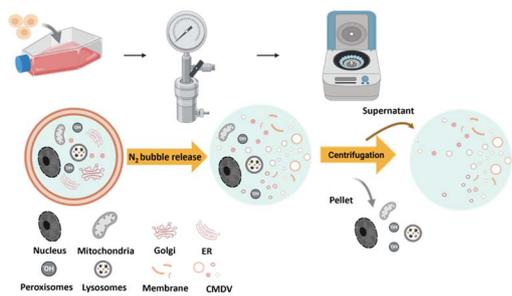
2003



Multimodal radiosensitization by hafnium oxide nanoparticles and HDAC inhibitors: mechanistic insights

Csenge Bocz, Dóra Izabella Adamecz, Krisztina Szóke, Bálint Péntek, Emília Rita Szabó, Róbert Polanek, Titanilla Szógi, Andrea Rónavári, Katalin Hideghéty, Zoltán Kónya, Nóra Igaz* and Mónika Kiricsi*

2021



Nitrogen cavitation enables rapid and high-yield preparation of functional cell-membrane-derived vesicles

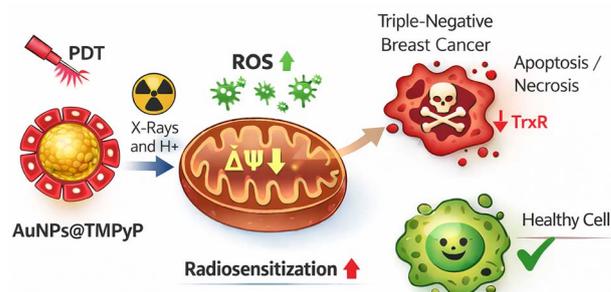
Changting Li,* Dehua Luo, Can Peng, Qun Luo, Wenjing Xu, Jincheng Zhou, Wen Su, Wei Wu and Yi-Feng Wang*



2031

Porphyrin-coated gold nanoparticles associated with X-rays and proton therapy in the treatment of triple-negative breast cancer

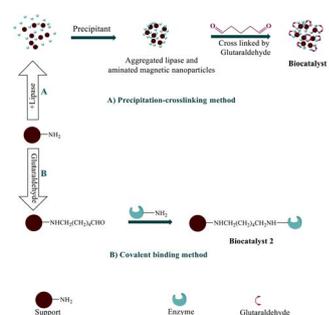
Camila Ramos Silva, Guillaume Berionni, Martha Simões Ribeiro and Anne-Catherine Heuskin*



2043

Synthesis and characterization of $ZrFe_2O_4$ and $ZrFe_2O_4@UiO-66-NH_2$ nanoparticles for efficient immobilization of *Humicola insolens* lipase: a comparative study of precipitation-crosslinking versus covalent binding methods

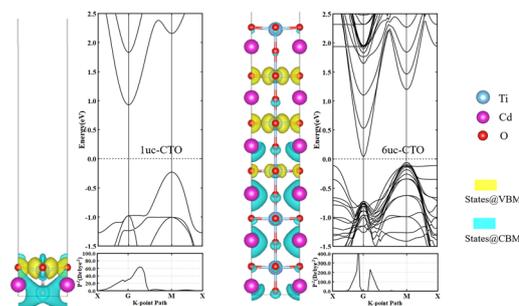
Kowsar Azizi, Saba Ghasemi* and Ahmad Nikseresht



2057

Thickness-dependent electronic and optical properties of two-dimensional perovskite oxide films: a first-principles study

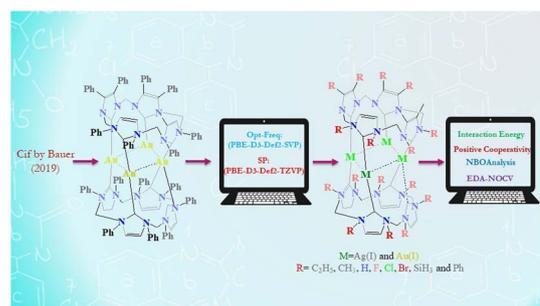
Huali Hao, Yuanbin Xue,* Cheng Huang and Xiaojing Bai



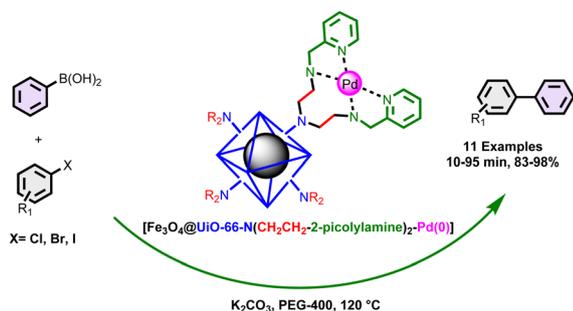
2065

Tetranuclear Ag(I) and Au(I) nano-sized $[L_2(R)]_8 \rightarrow M_4^{14+}$ ($M = Ag(I)$ and $Au(I)$); $R = C_2H_5, CH_3, H, F, Cl, Br, Ph$ and SiH_3) complexes: nature and cooperativity of metal–ligand bonds

Sepideh Goodarzi, Mehdi Bayat,* Sadegh Salehzadeh and Ehsan Alavipour



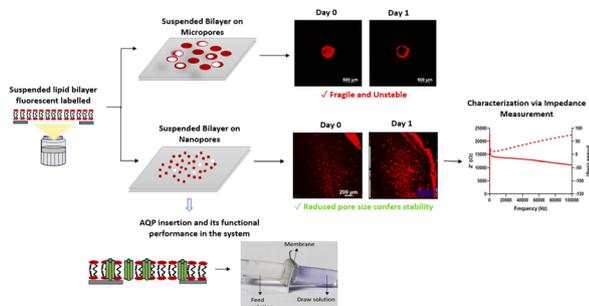
2079



A novel palladium-2-picolyamine complex grafted on magnetic UiO-66-NH₂ nanocomposites: as an efficient heterogeneous catalyst for fast Suzuki–Miyaura cross coupling

Parastoo Nasri and Masoomeh Norouzi*

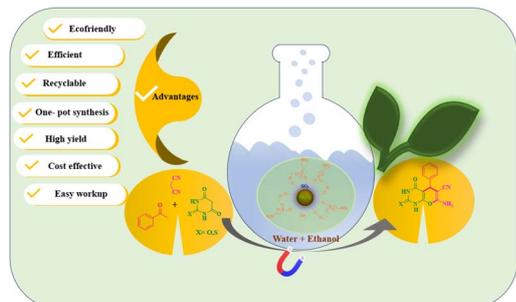
2096



Aquaporin embedded suspended lipid bilayer on anodized alumina nanoporous substrates for studying stability and functionality: towards the development of a miniaturized water purifier

Akanksha Kumari, Jaydeep Bhattacharya* and Ranjita Ghosh Moulick*

2107



Fe₃O₄@SiO₂@taurine: a magnetically recoverable green nanocatalyst for efficient synthesis of pyrano [2,3-d]pyrimidine derivatives

Charul Paliwal, Aanchal, Dharmendra, P. S. Ranawat, K. L. Ameta and Chetna Ameta*

