

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.

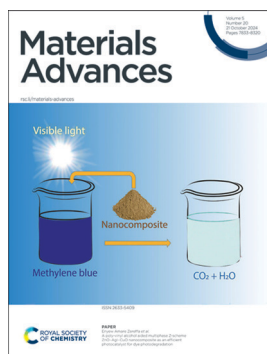
IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 5(20) 7833-8320 (2024)



Cover

See Ramasamy Paulmurugan *et al.*, pp. 8007–8016. Image reproduced by permission of Farbod Tabesh, Golnaz Haghverdi, Kireeti Phani Devarakonda, Tarik F Massoud and Ramasamy Paulmurugan from *Mater. Adv.*, 2024, 5, 8007.



Inside cover

See Enyew Amare Zereffa *et al.*, pp. 8017–8033. Image reproduced by permission of Enyew Amare Zereffa from *Mater. Adv.*, 2024, 5, 8017.

EDITORIALS

7844

Introduction to 'Multimodal remote actuation and sensing in polymer nanocomposites for advanced applications'

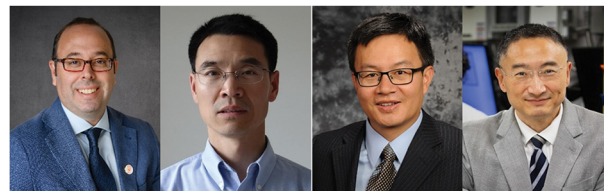
Vinay Deep Punetha,* Lorenzo Bardella and Mohammad Luqman



7847

Introduction to 'Conducting ceramic membranes for energy conversion and storage'

Kyle Brinkman,* Fanglin (Frank) Chen, Dong Ding and Xiao-Dong Zhou



**GOLD
OPEN
ACCESS**

EES Solar

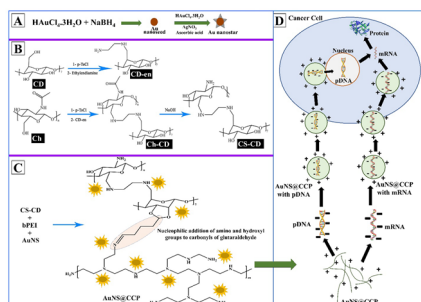
**Exceptional research on solar
energy and photovoltaics**



Part of the EES family

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

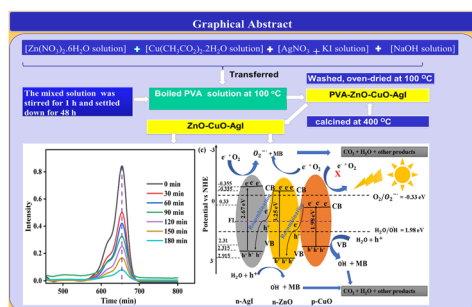
8007



Synthesis, characterization, and application of a biocompatible gene delivery nanocarrier constructed from gold nanostars and a chitosan–cyclodextrin–poly(ethylene imine) graft polymer

Farbod Tabesh, Golnaz Haghverdi, Kireeti Phani Devarakonda, Tarik F Massoud and Ramasamy Paulmurugan*

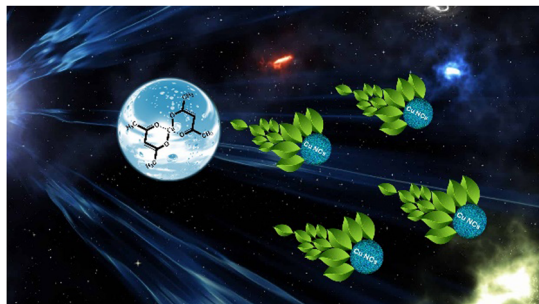
8017



A poly-vinyl alcohol aided multiphase Z-scheme ZnO–AgI–CuO nanocomposite as an efficient photocatalyst for dye photodegradation

Teketel Girma Gindose, Tsegaye Belege Atisme, Gebrehiwot Gebreslassie, Abera Beyene Gebresilassie and Enyew Amare Zereffa*

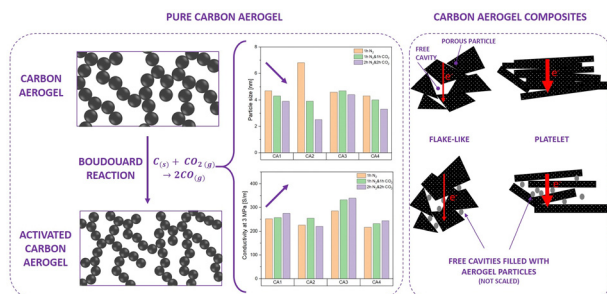
8034



Photochemical eco-friendly synthesis of photothermal and emissive copper nanoclusters in water: towards sustainable nanomaterials

Angelo Ferlazzo,* Stefano Bonforte, Federica Florio, Salvatore Petralia,* Lorenzo Sorace, Beatrice Muzzi, Andrea Caneschi* and Antonino Gulino*

8042



Electrical conductivity of monolithic and powdered carbon aerogels and their composites

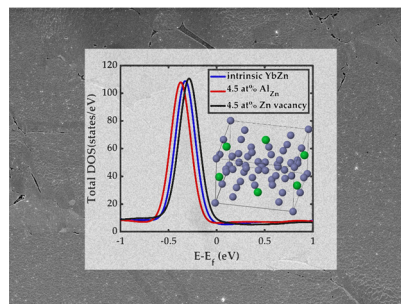
Jessica Kröner, Dominik Platzer, Barbara Milow and Marina Schwan*



8053

Thermoelectric properties of $\text{YbZn}_{11-x}\text{Al}_x$

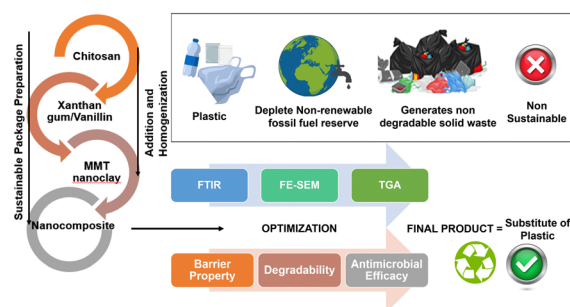
Shuai Li, Ruhul Quddus, Sree Sourav Das, Haobo Wang, Jerrold A. Floro and Mona Zebarjadi*



8060

Advancing sustainability: a novel biopolymer-based degradable nanoclay composite film for next-generation packaging

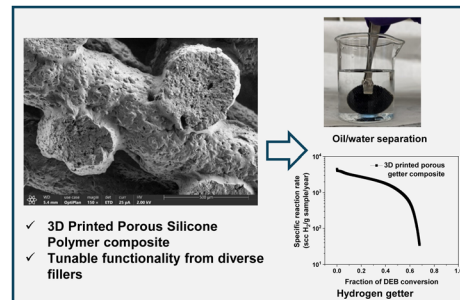
Zeba Tabassum, Madhuri Girdhar,* Tabarak Malik,* Anil Kumar and Anand Mohan



8074

3D printed porous silicone polymer composites using table salt as a sacrificial template

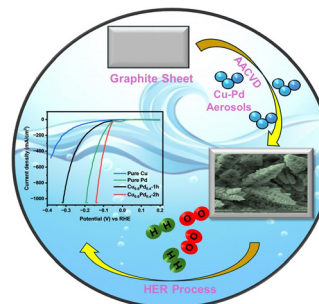
Santosh Adhikari,* Xavier M. Torres, John R. Stockdale, Shelbie A. Legett, Lindsey B. Bezek, Jesus A. Guajardo, Adam Pacheco, Karthik Ramasamy, Bart Benedikt, Matthew Lewis and Andrea Labouriau*



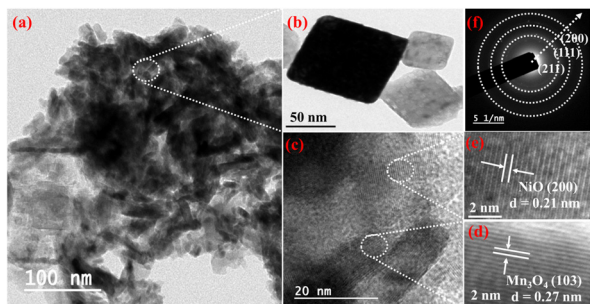
8086

Facile fabrication of binary copper–palladium alloy thin film catalysts for exceptional hydrogen evolution performance

Muhammad Ali Ehsan,* Akilarasan Muthumariappan, Muhammad Ali, Abbas Saeed Hakeem and Wasif Farooq



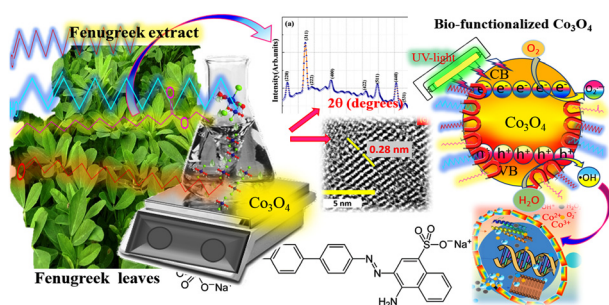
8097



Construction of a 3D flower-like NiO/Mn₃O₄ heterojunction using Tulsi leaf extract for enhanced photodegradation of thiamethoxam pesticide and organic dyes under direct sunlight

Mandvi, Prit Pal Singh, Suhas Ballal, Mamta Chahar, Jaya Bansal, Ranvijay Kumar, Sandeep Kumar and Sandeep Kaushal*

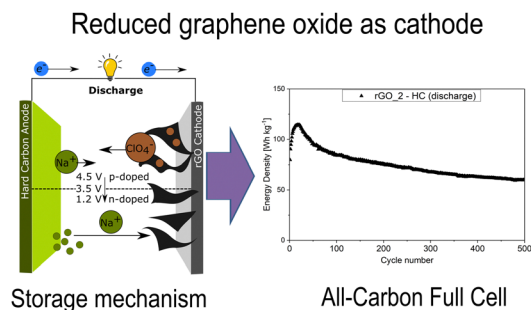
8111



Enhanced photocatalytic degradation and antimicrobial activities of biogenic Co₃O₄ nanoparticles mediated by fenugreek: sustainable strategies

Arshdeep Kaur, Sanjeev Kumar,* Harpreet Kaur, Gurmeet Singh Lotey, Prit Pal Singh, Gautam Singh, Supreet, Sunil Kumar, Jasvir Dalal,* Gassoumi Bouzid, Mrinmoy Misra, Raghvendra Pandey and Sandeep Kaushal

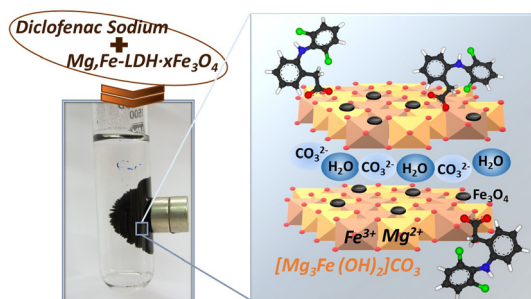
8132



Understanding the electrochemical behaviour of reduced graphene oxide cathodes in all-carbon Na-ion batteries

Marcin W. Orzech, Francesco Mazzali, Arturas Adomkevicius, Mauro Coduri, Yubiao Niu, James D. McGettrick, Philip A. Chater, Laura Cabo-Fernandez, Laurence J. Hardwick, Lorenzo Malavasi and Serena Margadonna*

8145



Surface engineering: binary Mg,Fe-LDH-*x*Fe₃O₄ nanocomposites for improved magnetic solid-phase extraction of pharmaceuticals from aqueous solution

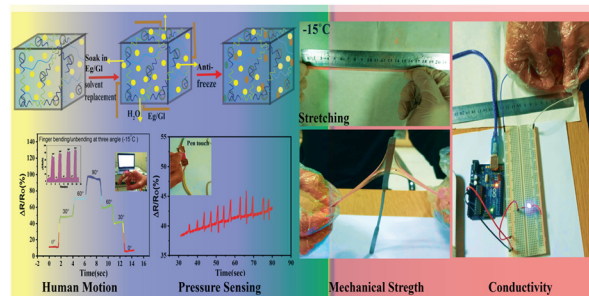
Tetiana Hubetska, Victor Demchenko and Natalia Kobylinska*



8164

Facile fabrication of stretchable, anti-freezing, and stable organohydrogels for strain sensing at subzero temperatures

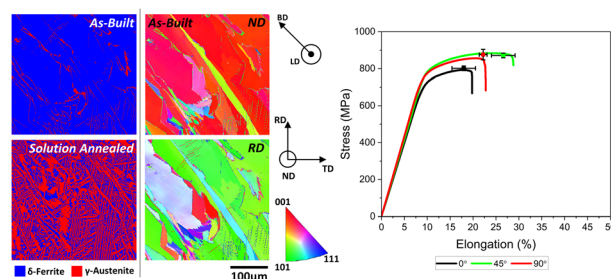
Muhammad Sher, Luqman Ali Shah,* Jun Fu, Hyeong-Min Yoo, Riaz Ullah and Mohamed A. Ibrahim



8177

Effect of build orientation and heat treatment on the microstructure, mechanical and corrosion performance of super duplex stainless steels fabricated *via* laser powder bed fusion

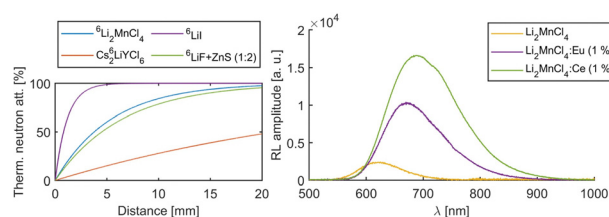
Karl Peter Davidson,* Ruiliang Liu, Chenyang Zhu, Mehmet Cagiciri, Li Ping Tan, Alpravinosh Alagesan and Sarat Singamneni



8199

Li₂MnCl₄ single crystal: a new candidate for a red-emitting neutron scintillator

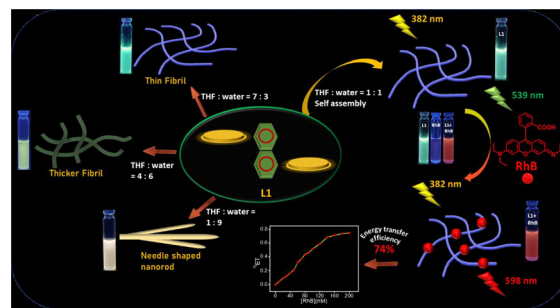
Vojtěch Vaněček,* Robert Král, Křehlíková Kateřina, Romana Kučerková, Vladimír Babin, Petra Zemenová, Jan Rohlíček, Zuzana Málková, Terézia Jurkovičová and Martin Nikl



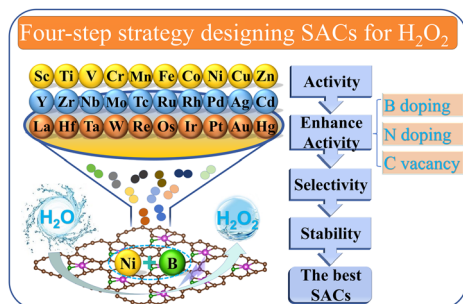
8208

A naphthalene–phenanthro[9,10-*d*]imidazole-based π -conjugated molecule with a self-assembly-induced tuneable multiple fluorescence output exhibits artificial light-harvesting properties

Priya Rana, Mallayasamy Siva, Rabindranath Lo* and Priyadip Das*



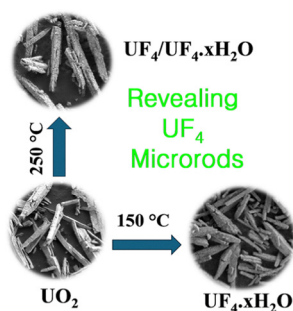
8223



Rational design of single-atom catalysts for efficient H_2O_2 production *via* a four-step strategy

Shu-Long Li, Xiaogui Song, Zuhui Zhou, Hongyuan Zhou, Liang Qiao,* Yong Zhao* and Li-Yong Gan*

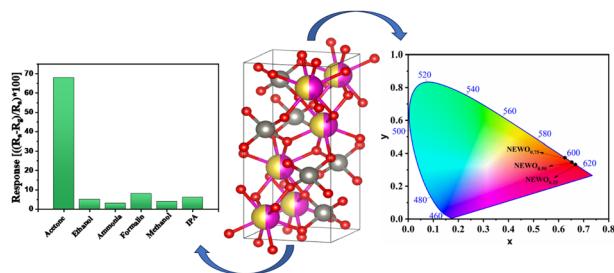
8233



Revealing uranium tetrafluoride microrods

Harry Jang and Frederic Poineau*

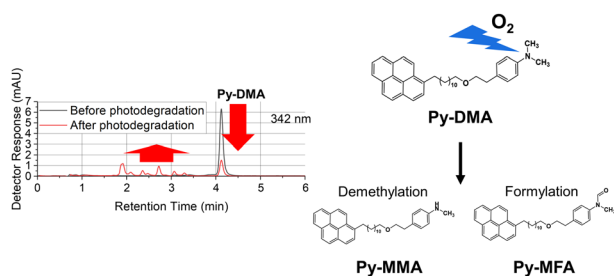
8238



Multifunctional $\text{NaEu}(\text{WO}_4)_2$: defect-tuned red emission and acetone sensing at room temperature

Kumar Riddhiman Sahoo, Tanushri Das, Mrinal Pal, Mohammad Rezaul Karim, Asiful H. Seikh and Chandan Kumar Ghosh*

8254



Primary photodegradation pathways of an exciplex-forming A–D molecular system

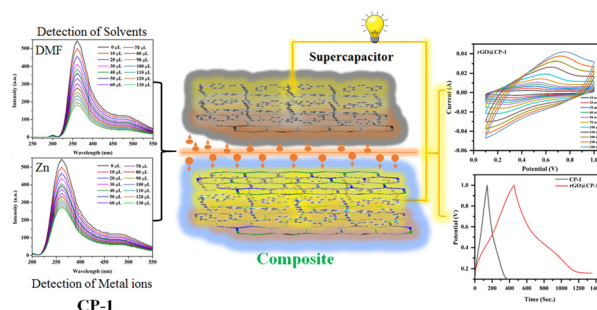
Yeongcheol Ki, Jonghyun Kim, Yeri Son, Suhyun Park, Won-jin Chung, Tae-Young Kim* and Hohjai Lee*



8265

A dual functional Cu(II)-coordination polymer and its rGO composite for selective solvent detection and high performance energy storage

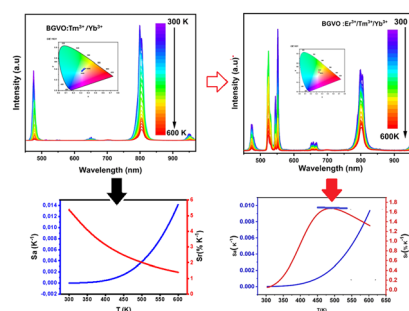
Basree, Waris, Arif Ali, Nishat Khan, Mohammad Zain Khan, Ganesh Chandra Nayak, Kafeel Ahmad Siddiqui* and Musheer Ahmad*



8280

Enhancing thermometric precision: modulating the temperature of maximum sensitivity via erbium dopant addition in Ba₂GdV₃O₁₁:Tm³⁺/Yb³⁺ nano phosphors

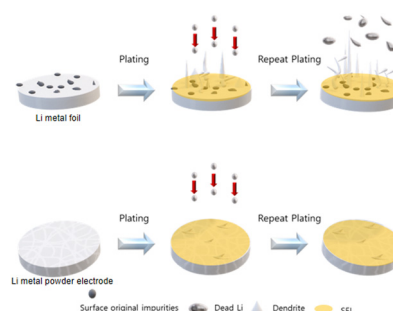
Ikhlas Kachou, Kamel Saidi, Christian Hernández-Álvarez, Mohamed Dammak* and Inocencio R. Martin



8294

Attaining improved cycling durability and engineering a dendrite-free lithium metal anode

Hyeong-Seok Oh, Rae-Hyun Lee, Jong-Kyu Lee, Jung-Rag Yoon,* Hyun-Kyung Kim* and Seung-Hwan Lee*



8304

Recycling waste aluminium foil to bio-acceptable nano photocatalysts [aluminium oxide (Al₂O₃) & aluminium oxyhydroxide (AlOOH)]; dye degradation as proof-of-concept

Bunty Sharma, Arshdeep Sahi, Jaspreet Dhau, Ajeet Kaushik, Rajeev Kumar* and Ganga Ram Chaudhary*

