

# Materials Advances

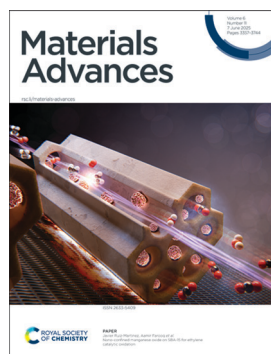
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ISSN 2633-5409 CODEN MAADC9 6(11) 3357-3744 (2025)



### Cover

See Javier Ruiz-Martinez, Aamir Farooq *et al.*, pp. 3467–3478. Image reproduced by permission of Aamir Farooq from *Mater. Adv.*, 2025, 6, 3467.



### Inside cover

See Bassam Alameddine *et al.*, pp. 3479–3494. Image reproduced by permission of Noorullah Baig from *Mater. Adv.*, 2025, 6, 3479. Image generated by Adobe Firefly (using a generative credit).

## EDITORIAL

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### Introduction to Materials and Devices for the Energy Transition in Latin America

Ana Flávia Nogueira,\* Gustavo Doubek and Hudson Zanin

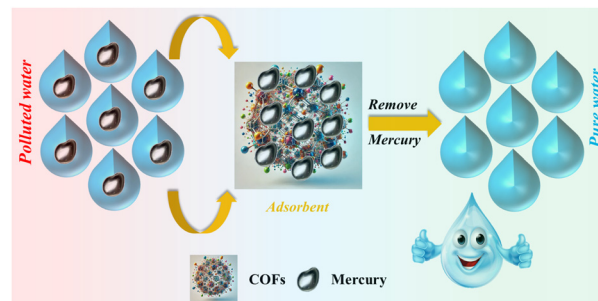


## REVIEWS

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### Mercury in aquatic environments: toxicity and advances in remediation using covalent organic frameworks

Kawan F. Kayani\* and Sewara J. Mohammed



# Environmental Science: Atmospheres

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Fundamental questions  
Elemental answers

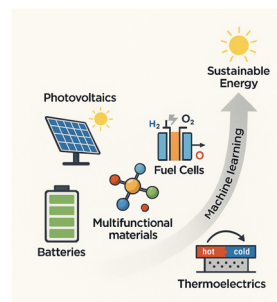


## REVIEWS

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### Bridging current and future innovations to unlock the potential of multifunctional materials for sustainable energy applications

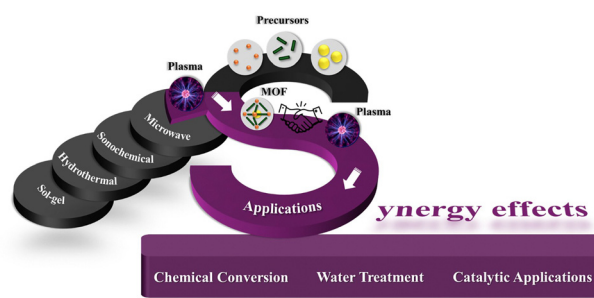
Aparna Ashok, Jitendra Pal Singh, Anuj Kumar and Neeru Bhagat\*



3416

### Unveiling the synergy between plasma and metal–organic frameworks for next-generation materials: an overview

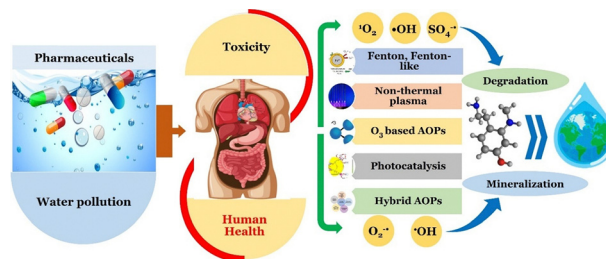
Amin Moghaddasfar, Ghodsi Mohammadi Ziarani, Rafael Luque\* and Alireza Badiei\*



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### Pharmaceutical pollution in the aquatic environment: advanced oxidation processes as efficient treatment approaches: a review

Kosar Hikmat Hama Aziz,\* Fryad S. Mustafa, Mozart A. H. Karim and Sarkawt Hama

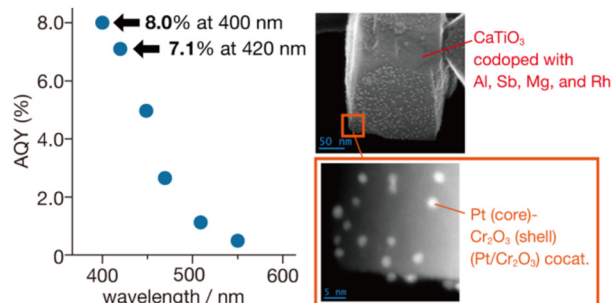


## COMMUNICATIONS

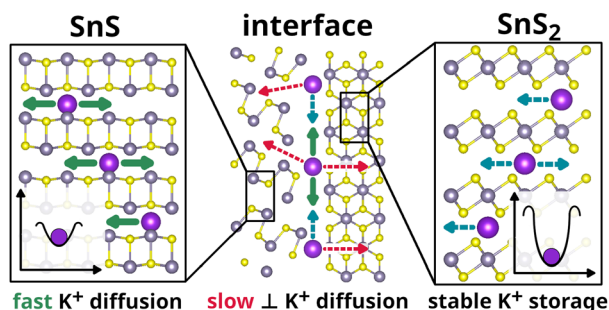
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### Visible-light-driven hydrogen evolution using calcium titanate codoped with aluminium, antimony, magnesium, and rhodium, loaded with a platinum (core)–chromia (shell) cocatalyst

Tomoya Ota, Ryota Tomizawa, Tomoya Nagano, Koji Hayashi and Shigeru Ikeda\*



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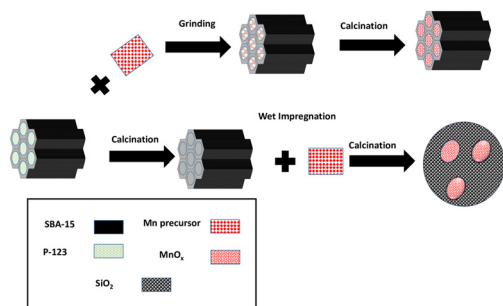


### Potassium cation storage and diffusion in SnS, SnS<sub>2</sub>, and at SnS/SnS<sub>2</sub> interfaces

Christoph Kirsch, Daniel Sebastiani and Pouya Partovi-Azar\*

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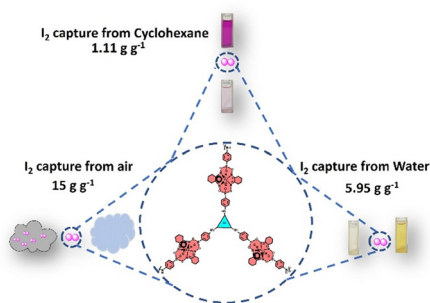
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### Nano-confined manganese oxide on SBA-15 for ethylene catalytic oxidation

Mohamad Abou-Daher, Hassnain Abbas Khan, Georgian Melinte, Sarah Komaty, Javier Ruiz-Martinez\* and Aamir Farooq\*

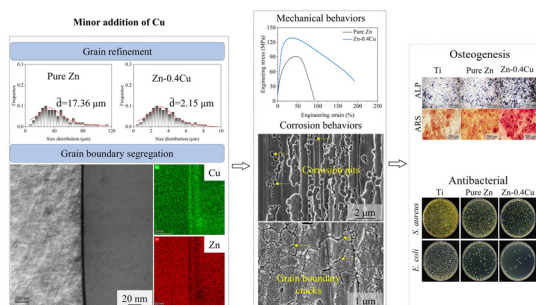
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### High-capacity iodine adsorption from diverse media using iron-based metal–organic copolymer networks synthesized *via* a microwave-assisted Buchwald–Hartwig cross-coupling reaction

Suchetha Shetty, Noorullah Baig, Badvel Pallavi, Rupa Bargakshatriya, Sumit Kumar Pramanik and Bassam Alameddine\*

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### Potential of biodegradable Zn alloys with fine grains for orthopedic and antibacterial applications

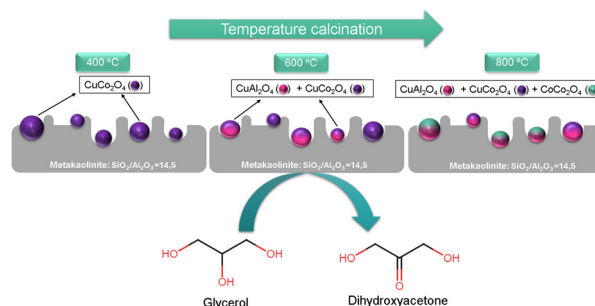
Haifeng Liang, Haoran Wu, Delong Yin, Hui Yu, Zhuoxuan He, Wenqian Zhang, Zerong Wang, Tuquan Zheng, Xiaochuan Li,\* Yu Cai\* and Guiyong Jiang\*



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### Catalytic performance of Cu–Co/metakaolinite: role of textural and structural properties in the partial oxidation of glycerol

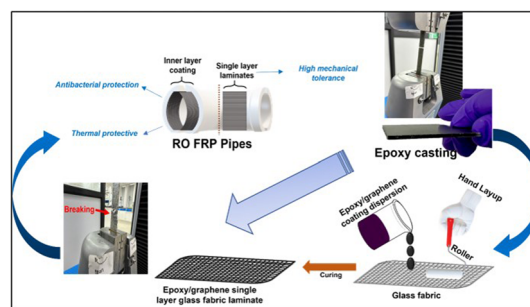
Laura C. Paredes-Quevedo, Catherine Batiot-Dupeyrat and Mauricio Velasquez\*



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### Effects of the shear rate on dispersion characteristics of industrial-based functionalized/non functionalized graphene in an epoxy matrix

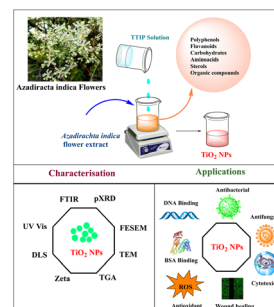
Sabyasachi Ghosh,\* Jitendra Bhatia, Amit Gupta, Chandrani Pramanik,\* Sumit Pratihari and Debabrata Rautaray



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### In vitro scratch assay, cytotoxicity, DNA/BSA binding properties, and antimicrobial activity of green synthesized TiO<sub>2</sub> nanoparticles via neem flowers

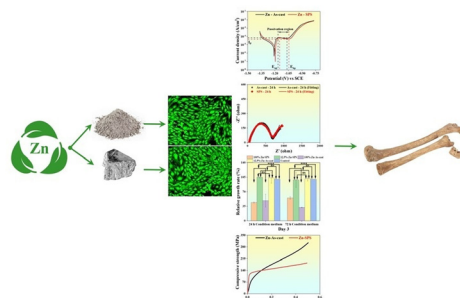
Palanivelmurugan Mohanasundaram and Mary Saral A.\*



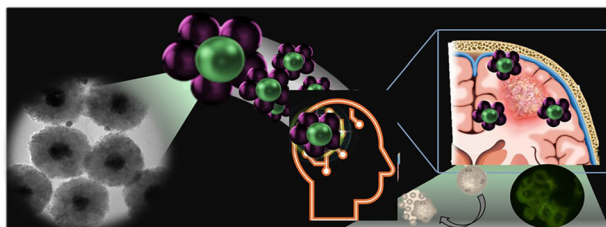
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### Microstructural, mechanical, corrosion, and biological behavior of spark plasma sintered commercially pure zinc for biomedical applications

Mayank Kumar Yadav, Riddhi Hirenkumar Shukla, K. Praveenkumar, Sagar Nilawar, Chandra Sekhar Perugu, Prabhukumar Sellamuthu, Kaushik Chatterjee, Satyam Suwas, J. Jayaraj and K. G. Prashanth\*



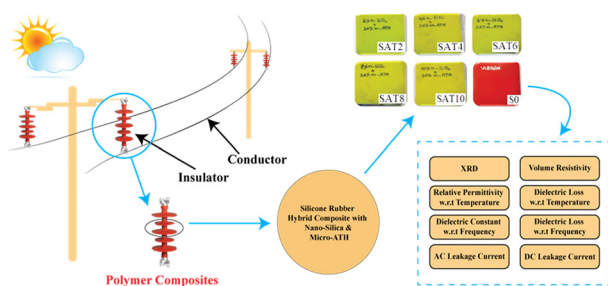
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### Hybrid silver–iron oxide nanoflowers: morphological tailoring, application as CT agents, and exploitation of induced apoptosis in glioblastoma treatment

Sofia G. Nikolopoulou, Beata Kalska-Szostko, Anna Basa, Giorgos Papanastasiou, Adriana Tavares, Carlos Alcaide Corral, Athina Papadopoulou, Marios Kostakis, Nikolaos S. Thomaidis and Eleni K. Efthimiadou\*

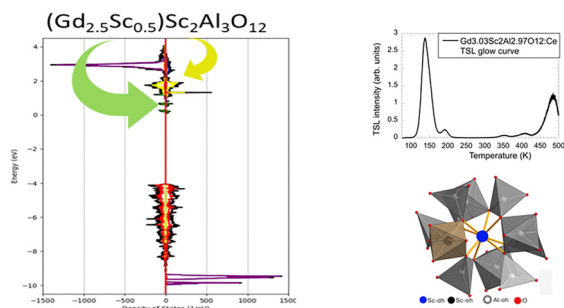
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### Exploring the dielectric properties of HTV silicone rubber based hybrid composites in a multi-stress aging environment

Fateha Aiman, Abraiz Khattak, Arooj Rashid,\* Safi Ullah Butt, Tahira Arshad, Yasin Khan, Khalid Hamad AlKhalid and Abdulrehman Al-Arainy

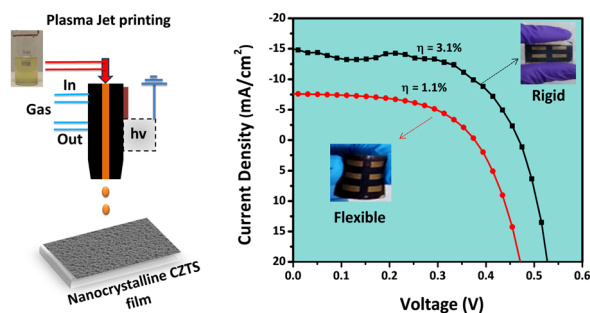
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### GSAG:Ce scintillator: material optimization and intrinsic bottlenecks

M. Nikl,\* J. Pejchal, J. Ježek, D. Sedmidubský, V. Laguta, V. Babin, A. Beitlerová and R. Kučerková

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### Low-temperature APPJ printing of Kesterite on flexible substrates for heterojunction solar cells

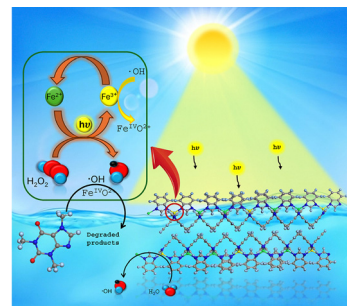
M. Dhanasekar, Stenny Benny, Avishek Dey,\* Satheesh Krishnamurthy\* and S. Venkataprasad Bhat\*



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### A hypervalent metal MOF catalyst as an avenue to go beyond heterogeneous Fenton-like processes for organic contaminant removal in water

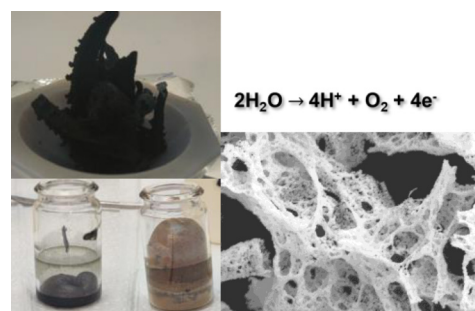
Lucas Santos-Juanes, Noelia Rodriguez-Sanchez, Salvador R. G. Balestra, Nuria O. Núñez, Antonio Arques, A. Rabdel Ruiz-Salvador\* and Menta Ballesteros\*



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### Exploring the combustion synthesis for yttrium ruthenate pyrochlores as OER electrocatalysts

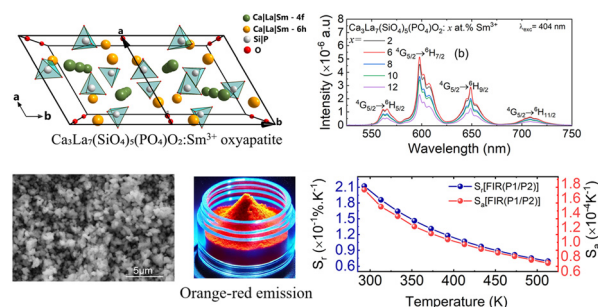
Megan Heath,\* Elise Fosdal Closs, Svein Sunde and Frode Seland



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### Photoluminescence characteristics and optical temperature sensing of orange-red emitting oxyapatite phosphor $\text{Ca}_3\text{La}_7(\text{SiO}_4)_5(\text{PO}_4)_2:\text{Sm}^{3+}$

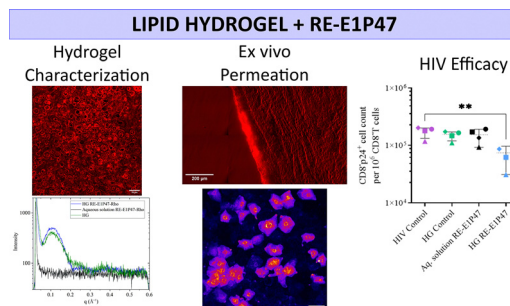
Abir Douzi, Sami Slimi, Eduard Madirov, Masood Ghotbi, Andrey Turshatov, Rosa Maria Solé, Magdalena Aguiló, Francesc Díaz, Ezzedine Ben Salem, Bryce S. Richards and Xavier Mateos\*



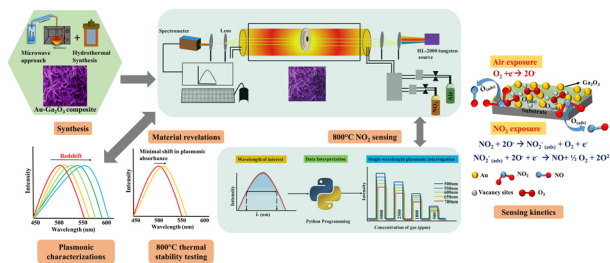
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### A lipid hydrogel to transport and release an anti-HIV-1 peptide into vaginal mucosa

Noèlia Loza-Rodríguez,\* Aina Millán-Sánchez, Aleix Benitez, Ramon Pons, María José Gómara, Isabel Haro, Meritxell Genescà and Olga López\*



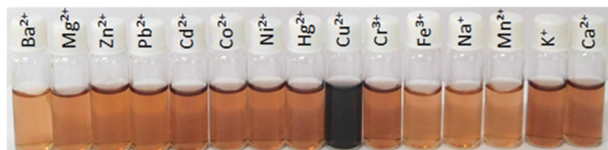
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### Plasmonically optimized gold–gallia nanocomposites: a novel approach for high-temperature NO<sub>2</sub> detection

L. Keerthana, Mushtaq Ahmad Dar, R. Sivasubramanian and Gnanaprakash Dharmalingam\*

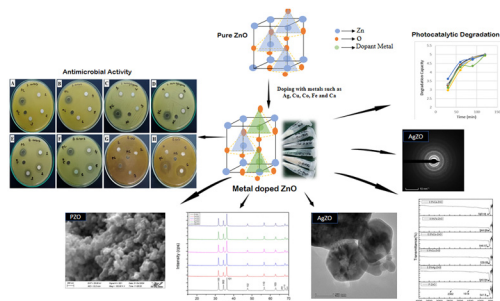
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### Onsite naked-eye detection and quantification of Cu(II) ions in drinking water using N-doped carbon nanodots

Nidhisha V. and Renuka Neeroli Kizhakayil\*

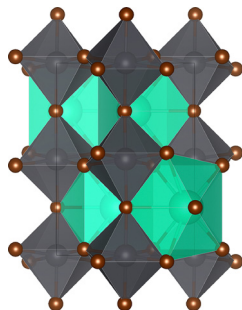
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### Tuning the antimicrobial and photocatalytic activity of nano-ZnO by metal doping

Md. Atikur Rahman, Md. Tanvir Hossain, Md Farid Ahmed, Muhammad Shahrir Bashar, Subarna Sandhani Dey, Samina Ahmed\* and Md. Sahadat Hossain\*

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### The role of primary and secondary electrons in scanning transmission electron microscopy of hybrid perovskites: the CsPbBr<sub>3</sub> case

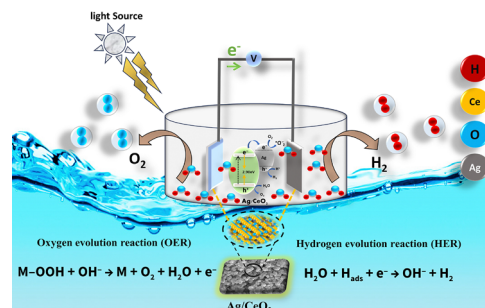
P. E. Trevisanutto,\* S. Taioli, M. Dapor, C. S. Allen and G. Teobaldi



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## Oxygen vacancies induced low overpotentials of Ag/CeO<sub>2</sub> for electrocatalytic evolution of oxygen and hydrogen

Ajit Kumar Dhanka, Mayank Tiwari, Prashant Kumar Bhartiya, Balaram Pani, Nityananda Agasti\* and Debabrata Mishra\*



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## Phyto-mechanochemical synthesis of an Ag@GO/CNT catalyst: enhanced hydrogen production via a continuous flow system

Fatimah ALSulami, Merfat M. Alsabban, Hadeel M. Banbela, Noushi Zaidi, Sadaf Habib, Dina Hajjar, Arwa A Makki, Ismat Bibi, Tariq Javed, Aysha Afzal and Muhammad Babar Taj\*

