

# Materials Advances

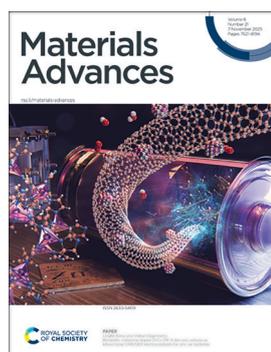
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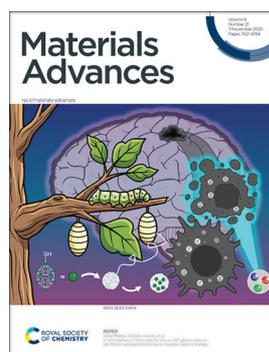
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ISSN 2633-5409 CODEN MAADC9 6(21) 7621-8194 (2025)



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See Lingfei Kong and Volkan Degirmenci, pp. 7779–7790. Image reproduced by permission of Volkan Degirmenci from *Mater. Adv.*, 2025, 6, 7779.



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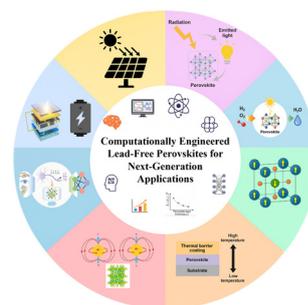
See Daniela Imperio, Ivana Miletto *et al.*, pp. 7791–7799. Image reproduced by permission of Ivana Miletto and Daniela Imperio from *Mater. Adv.*, 2025, 6, 7791. Created in BioRender. Miletto, I. (2025) <https://BioRender.com/7z4z51l>

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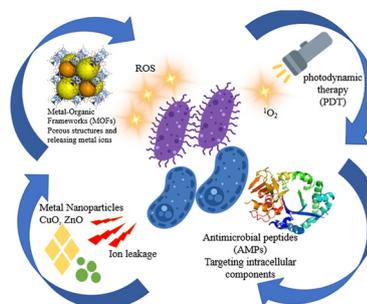
Syeda Kinza Fatima, Reem H. Alzard,\* Riffat Amna, Mohammed H. Alzard, Kaibo Zheng and Mohamed Abdellah\*



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### Beyond antibiotics: novel solutions to address antibacterial resistance

Afsaneh Arshadi Edlo, Kamran Akhbari\* and David J. Henry



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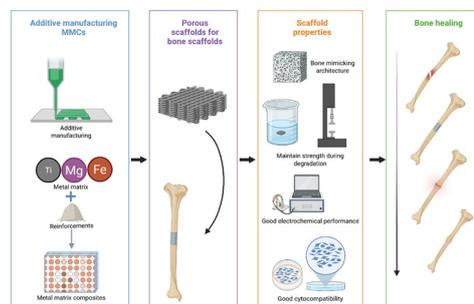


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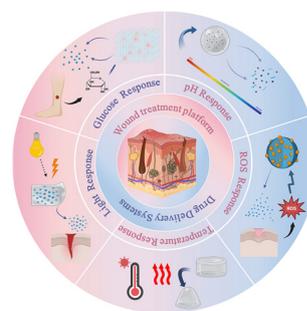
Eisha Khalid, Ahmed Bahgat Radwan,\*  
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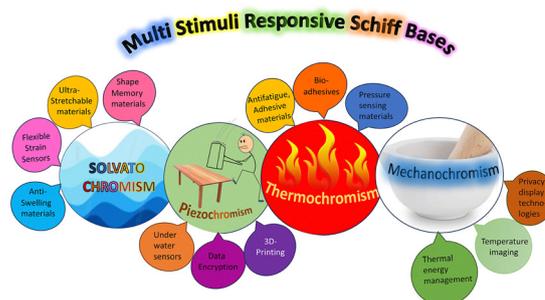
Weiwei Yang, Ning Liang, Lan Liu, Zhaojun Jian,  
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Dimpi Gupta, Divyanshu Singh, Anushka Koranne,  
Chandni Singh, Sunil Kumar Singh,\* Rajat Pratap Singh  
and Ashish Kumar Singh\*

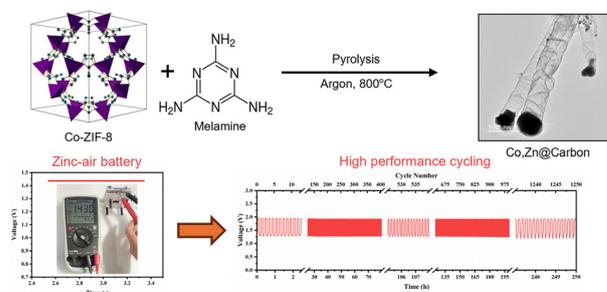


## PAPERS

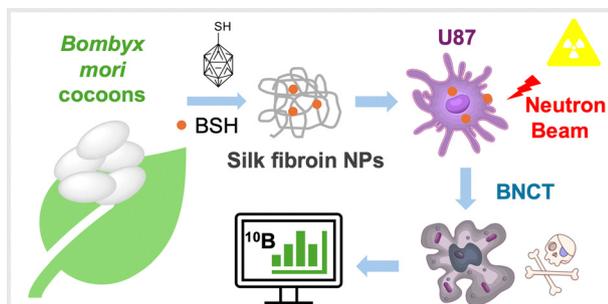
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### Bimetallic melamine doped ZnCo-ZIF-8 derived carbons as bifunctional ORR/OER electrocatalysts for zinc-air batteries

Lingfei Kong and Volkan Degirmenci\*



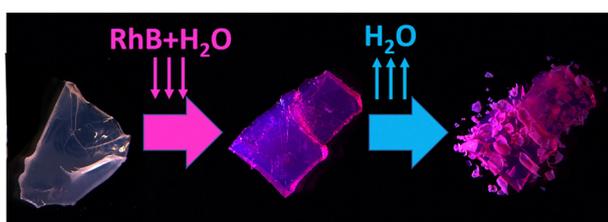
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Elia Bari, Ian Postuma, Ivana Miletto,\* Daniela Imperio,\* Silva Bortolussi, Laura Cansolino, Cinzia Ferrari, Yuan-Hao Liu, Yuan Zhenwei, Maria Luisa Torre and Luigi Panza

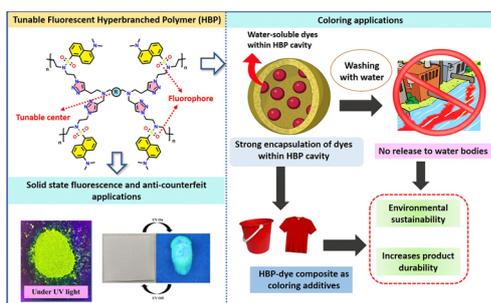
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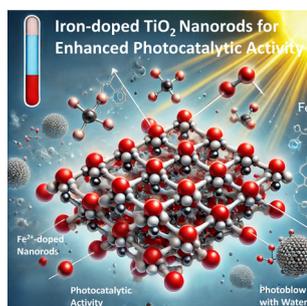
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Geethanjali Anand and Mintu Porel\*

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### Design, synthesis, and structural characterization of Fe<sup>2+</sup>-doped anatase TiO<sub>2</sub> nanocrystals and its impact on electronic properties and photocatalytic activity

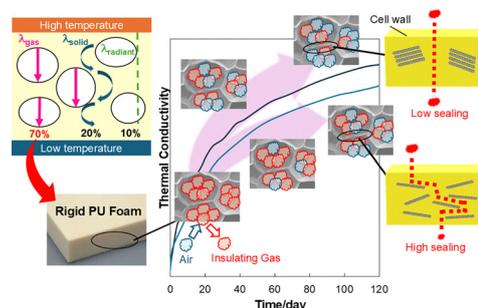
Rayhan Hossain,\* Jessica Hollow, Violet Chesterfield, Daisy Langley and Allen Applett\*



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### Clay-based polyurethane foam nanocomposites for thermal insulation

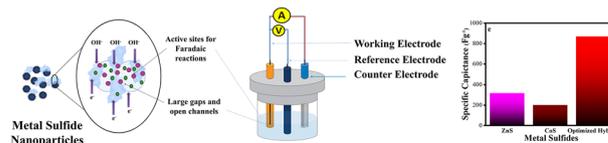
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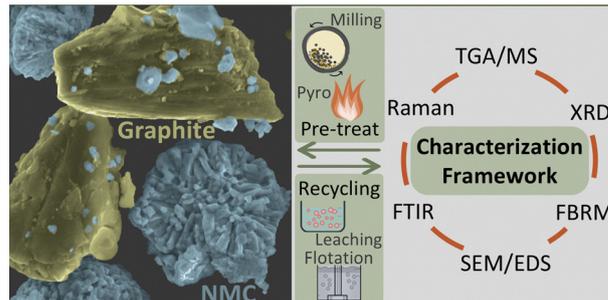
Hafeez Ur Rehman, Hamza Khan, Zeeshan Abbasi, Lotfi Ben Tahar, Rafaqat Ali Khan, Amir Waseem and Ahson Jabbar Shaikh\*



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### Material characterization of NMC black mass from end-of-life lithium-ion batteries for enhanced recycling strategies

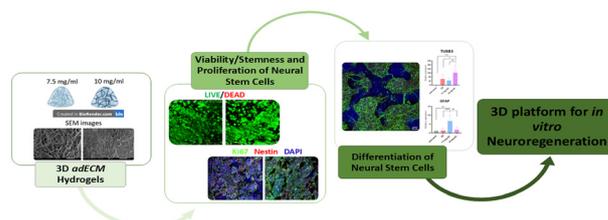
Hammad Farooq and Sulalit Bandyopadhyay\*



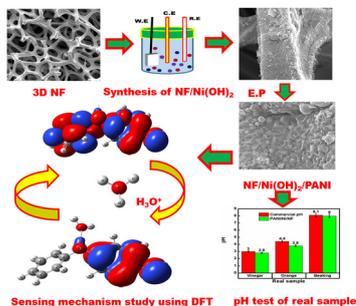
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### Adipose tissue-derived ECM hydrogels as a 3D platform for neural differentiation and brain diseases

Kyriaki Stampouli, Lina Papadimitriou, Andrea García-Lizarribar, Iratxe Madarieta, Beatriz Olalde and Anthi Ranella\*



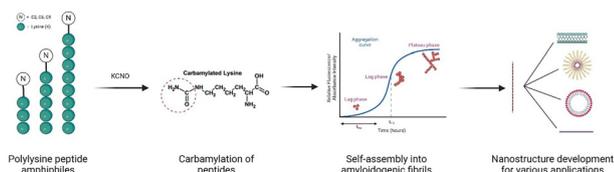
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## A highly sensitive and reliable pH sensor based on a polyaniline-nickel hydroxide modified nickel foam electrode: electrochemical and DFT investigations

Mirazul Islam, Md. Sanwar Hossain, N. Padmanathan, Kafil M. Razeeb\* and Mamun Jamal\*

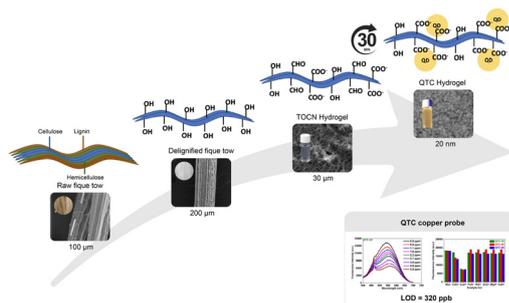
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## Self-assembly of carbamylated lysine repeat peptide amphiphiles into fibrillar nanostructures

Vivek Shekhar, Tamalika Paul, Joshna Gadhavi\* and Sharad Gupta\*

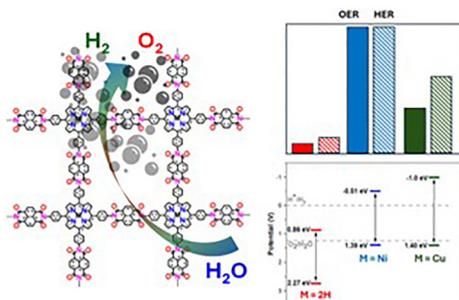
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## Porphyrin-based polyimide 2D porous organic polymers: band engineering for bifunctional electrocatalytic OER and HER

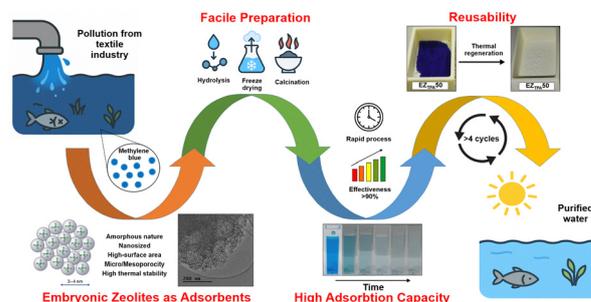
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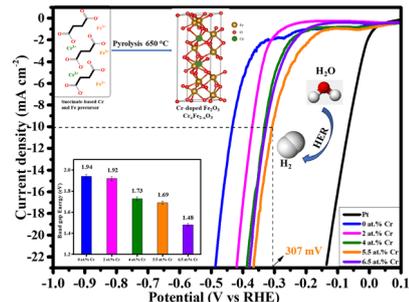
Farnaz Shammiry and Alejandro Montesinos-Castellanos\*



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## Succinate coprecipitation synthesized Cr-doped Fe<sub>2</sub>O<sub>3</sub> as an efficient electrocatalyst for hydrogen evolution reaction in alkaline medium

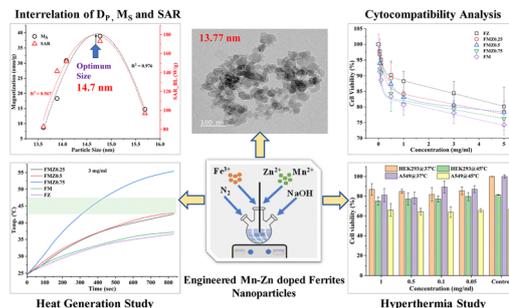
Paulin Kammi Yontchoum, Carelle Martiale Kamga Meffo, Bilal Tasdemir, Kenneth Mbene, Cedrik Ngnintedem Yonti, Bilge Saruhan, Patrice Kenfack Tsobnang and Roussin Lontio Fomekong\*



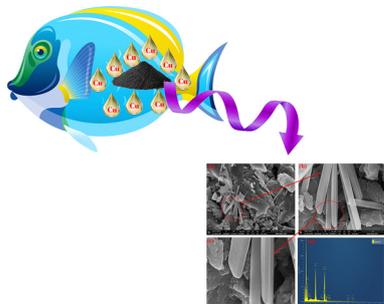
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## Engineered Mn–Zn-doped ferrite nanomaterials: exploring magnetothermal effects for cancer treatment

Rushikesh Fopase, Krishna Priya Hazarika, J. P. Borah and Lalit M. Pandey\*



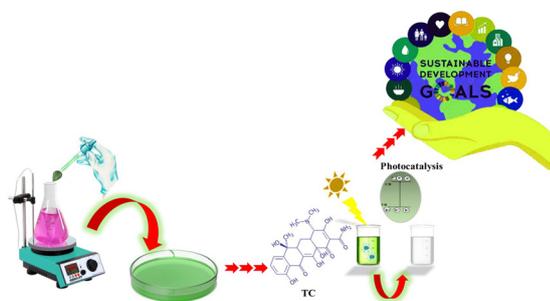
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### Pioneering bio-derived greener and sustainable Cu/biochar nanoplates for expedient adsorption of DR 227 dye

Amna Sanaullah, Sadia Muzammal, Awais Ahmad,\* Sadia Ata,\* Raziya Nadeem, Maryam Sana, Mohammed Habila and Ghulam Mustafa\*

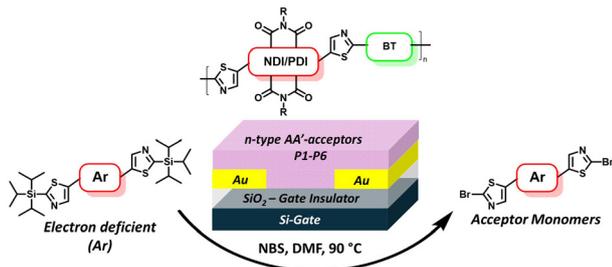
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### Sustainable synthesis of Nd<sub>2</sub>O<sub>3</sub> nanoparticles for photocatalytic degradation of tetracycline in aqueous media

Sadia Muzammal, Awais Ahmad,\* Sadia Atta, Afzal Hussain, Shafaqat Ali,\* Ayesha Sadiqa\* and Patrizia Bocchetta\*

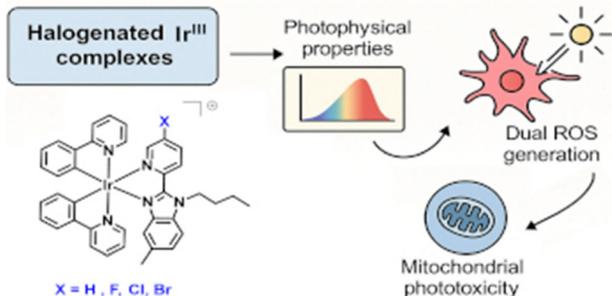
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Salahuddin S. Attar, Ji Hwan Kim, Maciej Bartóg, Dusan Sredojevic, Alex Kalin, Lei Fang, Hassan S. Bazzi, Sara J. Al-Hail, Myung-Han Yoon and Mohammed Al-Hashimi\*

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### Cationic iridium(III) complexes with a halogen-substituted pyridylbenzimidazole ancillary ligand for photodynamic therapy

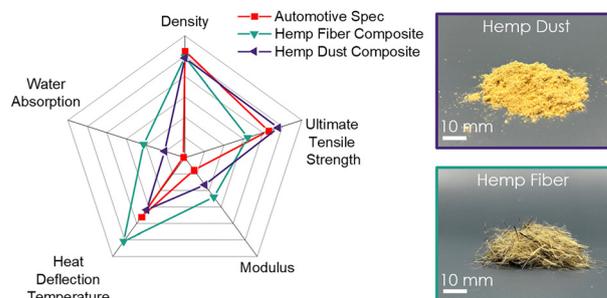
Pierre-Henri Lanoë,\* Frédérique Loiseau, Christian Philouze, Camille Latouche, Laetitia Vanwonderghem, Louis Biancon, Ahmed S. Faihan, Florian Molton, Matéo Lavaud, Anne-Laure Bulin, Jean-Luc Coll, Akos Banyasz and Amandine Hurbin\*



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### Elucidating the impact of fiber source on polypropylene/hemp composite performance for the automotive industry

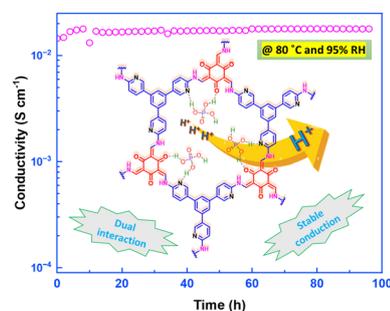
Amber M. Hubbard,\* Julia Gelfond, Kathryn Slavny, Komal Kooduvalli, Katie Copenhaver, Meghan E. Lamm, Sanjita Wasti, Matthew Korey, Yunqiao Pu, Caitlyn M. Clarkson and Umesh Marathe



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### Dual molecular interaction-triggered stable proton conductive channels in heteroatom-embedded covalent organic frameworks

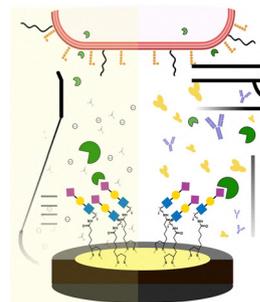
Vellaichamy Joseph, Keiichiro Maegawa, Hassan Alipour, Marek J. Potrzebowski, Krzysztof Łyczko and Atsushi Nagai\*



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### Sialylated glycan-based impedimetric biosensing for the detection of *Vibrio cholerae* biomarkers in cell culture media

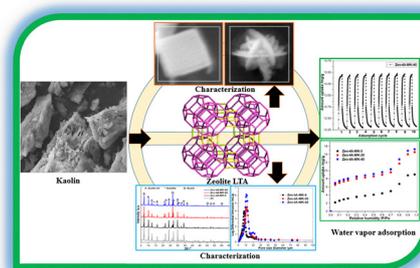
Hen Okshtein, Israel Alshanski, Raghavendra Kikkeri,\* Shlomo Yitzchaik\* and Mattan Hurevich\*



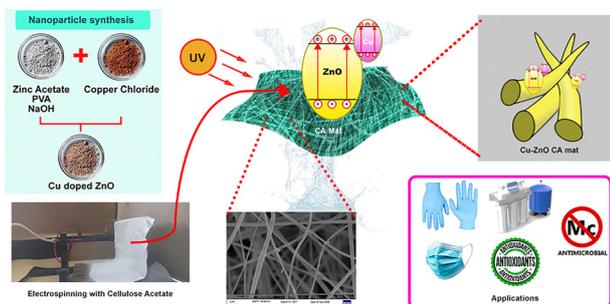
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### Investigating the impact of heating rates on hydrothermal conversion of heat-treated kaolin into Linde-type LTA zeolite for water vapor sorption

Cyrille Ghislain Fotsop, Alexandra Lieb and Franziska Scheffler\*



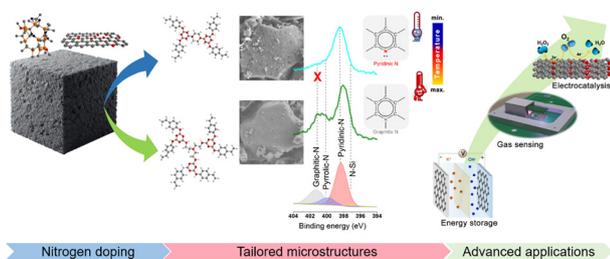
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### Fabrication and characterization of Cu–ZnO–cellulose acetate electrospun nanocomposite membranes for dual-function photocatalytic degradation and microbial inhibition

Hasitha Herath, Viduranga Pasindu, Piumika Yapa, Sanduni Dabare, Imalka Munaweera,\*  
Manjula M. Weerasekera and Upeka Samarakoon

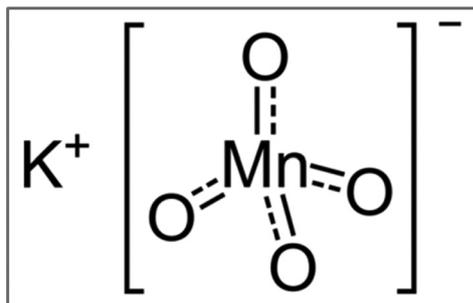
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### Engineering nitrogen doping of silicon oxycarbide structures through tailored dendritic molecular architectures

Berta Pérez-Román,\* M. Alejandra Mazo, Alejandro Merchán del Real, Juan Rubio and Fernando Rubio-Marcos\*

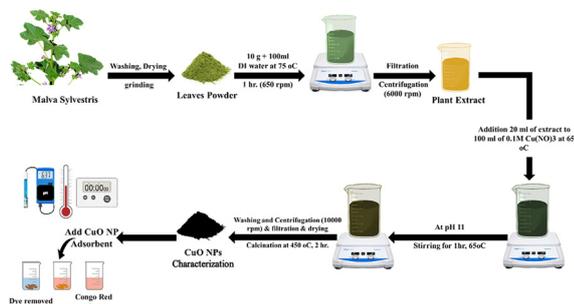
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### A study on the third-order nonlinear optical properties of pure $\text{KMnO}_4$ using the CW Z-scan technique

R. Santhosh Kumar,\* Eldo Abraham Thomas and Sandeep Suresh

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### Enhanced adsorption of an organic dye by phyto-synthesized CuO nanoparticles derived from *Malva sylvestris* for sustainable environmental remediation

Ahmad Jaddo Mohammed Ameen, Khalid M. Omer\* and Amin K. Qasim



