

# Materials Advances

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## IN THIS ISSUE

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### Cover

See Hyojung Kim *et al.*, pp. 4158–4173. Image reproduced by permission of Hyojung Kim from *Mater. Adv.*, 2025, 6, 4158.



### Inside cover

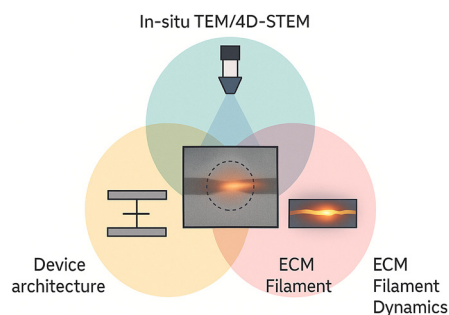
See Koon-Yang Lee *et al.*, pp. 4202–4210. Image reproduced by permission of Koon-Yang Lee and Joanne Li from *Mater. Adv.*, 2025, 6, 4202.

## REVIEWS

4158

### Advances in resistive switching memory: comprehensive insights into ECM mechanisms through TEM observations and analysis

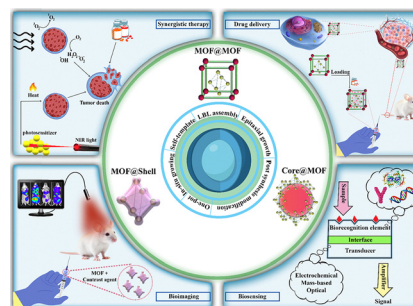
Woonbae Sohn, Hyerim Kim, Jung Hun Lee, Young-Seok Shim, Cheon Woo Moon\* and Hyojung Kim\*



4174

### A review of core-shell metal-organic frameworks: preparation and biomedical applications

Simindokht Zarei-Shokat, Sheyda Abedi-Banaei, Amir Kashtiaray, Zahra Yazdi, Haniyehalsadat Amirhosseini and Ali Maleki\*



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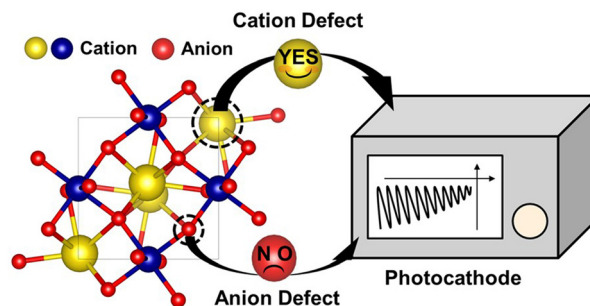


## COMMUNICATION

4197

### Utilization of neural network potential for determining perovskite-type metal oxide photocathodes capable of producing hydrogen

Shuya Masuda, Yosuke Harashima, Tomoaki Takayama,\* Shogo Takasuka and Mikiya Fujii\*

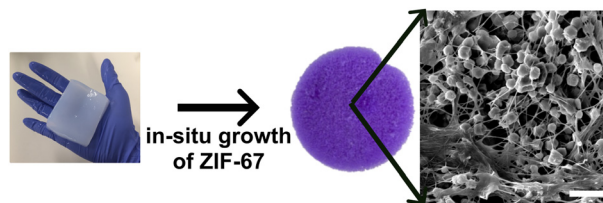


## PAPERS

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### Zeolitic imidazolate framework decorated bacterial cellulose coating for enhancing particulate filtration and adsorption from liquid and vapour phases of woven fabric

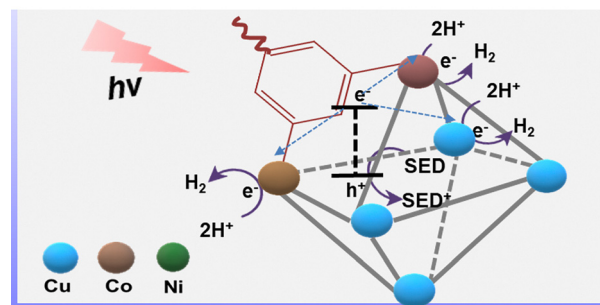
Joanne Li, Armando Garcia, Anett Kondor, Corinne Stone, Martin Smith, Mike Dennis and Koon-Yang Lee\*



4211

### In situ decorated Ni and Co in a CuBTC MOF for synergistic photocatalytic hydrogen generation

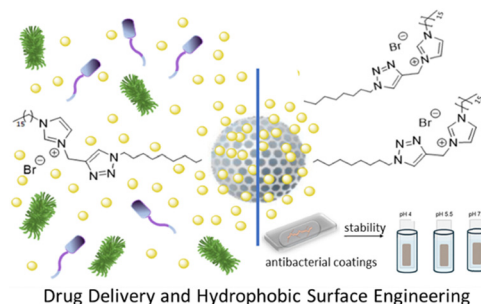
Bhavya Jaksani, Janardhan Abburi, Hafijul Islam, Spandana Gonuguntla, Tinku Baidya and Ujjwal Pat\*



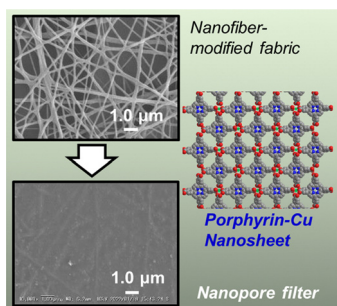
4220

### Ionic liquid modified mesoporous silica nanocarriers for efficient drug delivery and hydrophobic surface engineering

Annika Szymura, Shaista Ilyas,\* Florian Grohmann and Sanjay Mathur



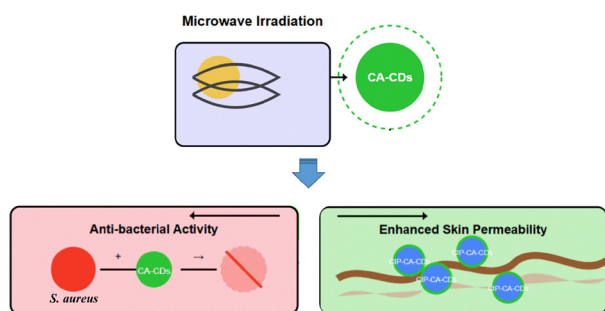
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### Hybridization of nanofiber-modified fabrics with porphyrin-based nanosheets for nanoparticle capture

Yusuke Kuramochi, Yuna Aoki, Kyoko Enomoto, Seiji Nakamura, Hideyuki Tanaka, Keiichiro Ozawa, Miki Hasegawa, Osamu Ohsawa, Kei Watanabe\* and Kazuyuki Ishii\*

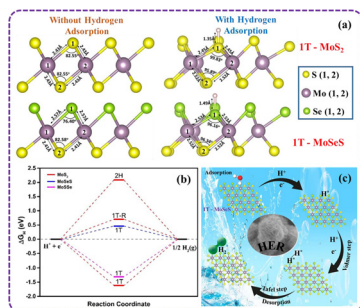
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### Cinnamic acid-derived carbon dots by microwave irradiation synergise the ciprofloxacin effect against *Staphylococcus aureus* and promote its skin permeability

Tompe Krishna Vitthal, Varaprasad Rao Regu, Bhabani Shankar Das, Ashirbad Sarangi, Mahendra Gaur, Amrita Ray, Arun Kumar Pradhan, Soma Chattopadhyay and Bharat Bhusan Subudhi\*

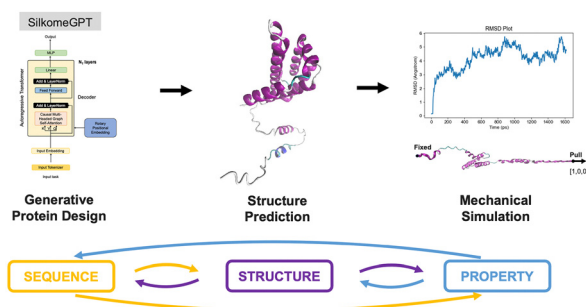
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### Phase selective hydrothermal synthesis of 1T MoS<sub>2</sub> and Janus 1T MoSSe for the hydrogen evolution reaction

Kushal Mazumder, Chob Singh, N. J. Hemavathi, Suman Kalyan Sahoo, Arvind H. Jadhav and Pramoda K. Nayak\*

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### Generative design and molecular mechanics characterization of silk proteins based on unfolding behavior

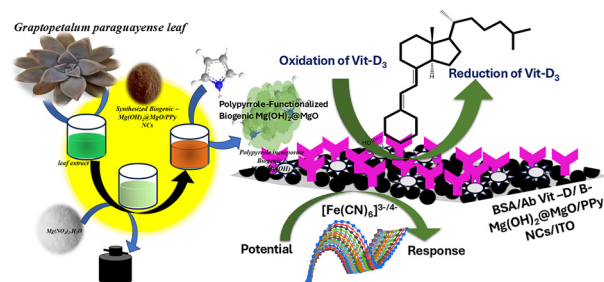
Wei Lu and Markus J. Buehler\*



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### Fabrication of a polypyrrole-functionalized biogenic $\text{Mg}(\text{OH})_2@ \text{MgO}$ immunosensor, synthesized using *Graptopetalum paraguayense* leaf extract, for selective and efficient impedimetric detection of cholecalciferol (Vit- $\text{D}_3$ )

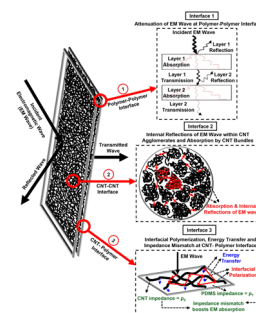
Sarita Shaktawat, Surendra K. Yadav and Jay Singh\*



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### Tailoring electromagnetic interference shielding properties in sandwich architectures made with low-concentration multi-walled CNT-reinforced PDMS

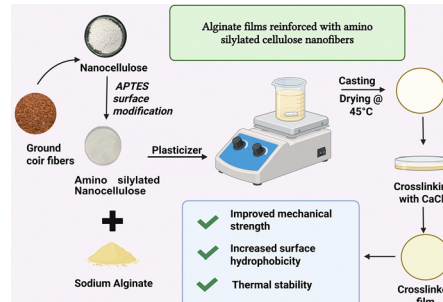
Pavithra Ananthasubramanian, Pritom J. Bora, Chandana Gadadasu, Praveen C. Ramamurthy and Nagarajan Raghavan\*



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### Influence of amino silane-modified nanocellulose on the physico-chemical and mechanical properties of alginate films

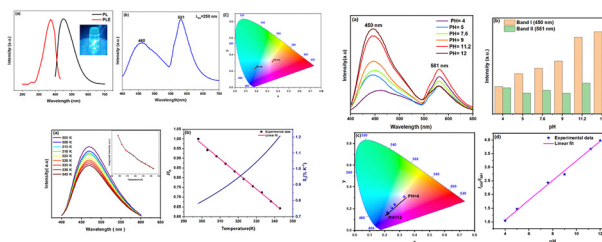
Shenbagaraman Akshaya and A. Joseph Nathanael\*



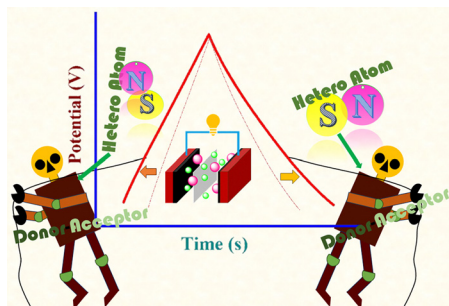
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### Highly photoluminescent carbon dots: a multifunctional platform for pH sensing, nano thermometry, and mercury(II) detection

Mouna Fhoula, Ikhlas Kchaou, Christian Hernández-Álvarez, Mohamed Dammak,\* Sami Boufi and Inocencio R. Martín



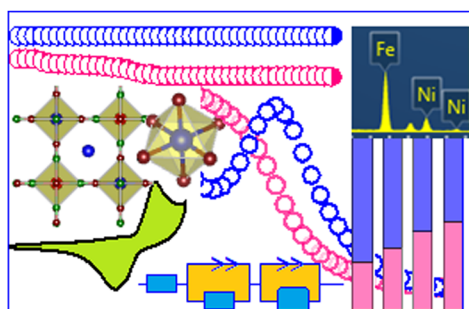
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### Enhanced electrochemical performance of S,N-containing carbon materials derived from covalent triazine-based frameworks with a tetrathiafulvalene core

Arijit Maity, Anupam Jana, Sandeep Kumar Dey, Christoph Janiak\* and Asamanjoy Bhunia\*

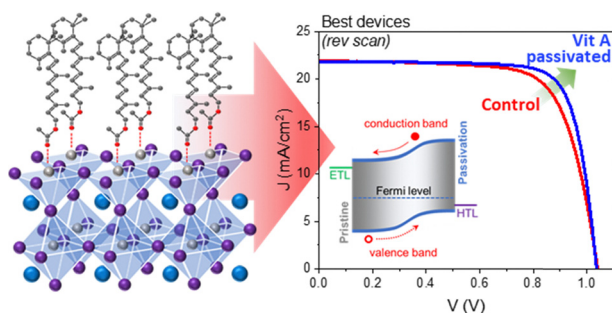
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### Investigation of energy storage performance in organic molecule-stabilized nickel ferrocyanide nanoparticles for supercapacitor applications

Pooja Kumari, Lungelo Lekokotla, Chandan Saha, Sarit K Ghosh, Harishchandra Singh and Kaushik Mallick\*

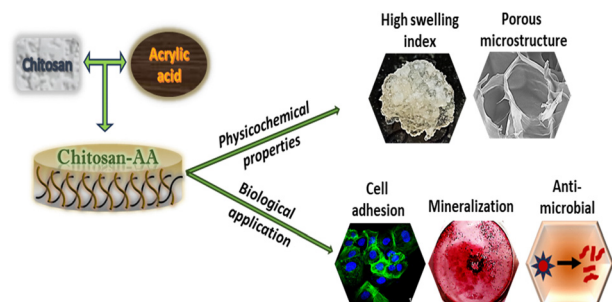
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### Vitamin A as a simple, dual-role agent for the band bending-induced passivation of perovskite solar cells

James C. Solano, Itaru Raifuku,\* Hidenori Kawanishi and Yukiharu Uraoka

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### Chitosan–acrylic acid biomaterial with an antimicrobial nature supports biomineralization and is suitable for bone tissue regeneration

Sweta Agarwal, Abhishek Singh, Satish Kumar, Tejas Pravin Rokade, Chandan Goswami and Luna Goswami\*



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### A ZnS–SnS<sub>2</sub>/S–rGO ternary heterostructure for electrochemical detection of azo dye sunset yellow in food samples

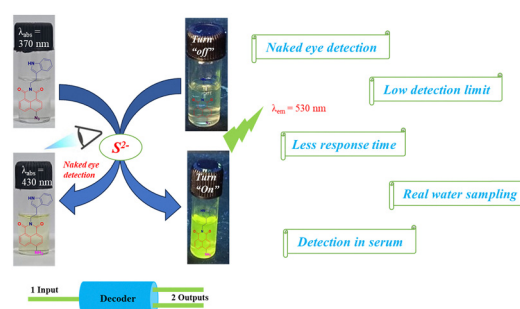
Hanieh Ghaedi, Khadijeh Ghanbari\* and Sepideh Bonyadi



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### A naphthalimide-derived chemosensor for ratiometric detection of sulphide ions: insights into the S<sup>2-</sup>-driven reduction cascade, real-time applications and live cell imaging of bacterial cells

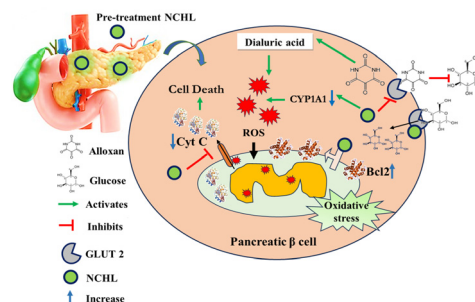
Saurabh Gupta, Gulshan Kumar, Vijay Luxami and Kamaldeep Paul\*



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### Unveiling the nano-particle enabled synergistic mitigation of the Bcl2/Cyt c/CYP1A1 signaling axis as a protective therapeutic route in mitochondrial dysfunction associated diabetes

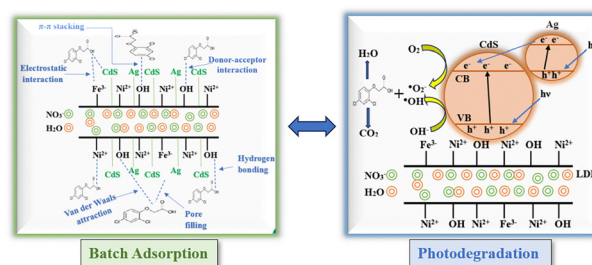
Sudatta Dey, Rishita Dey, Priyanka Sow, Banani Bhattacharjee, Arnob Chakrovorty, Sujan Sk, Manindranath Bera, Sisir Nandi, Pradeepta Guptaroy and Asmita Samadder\*



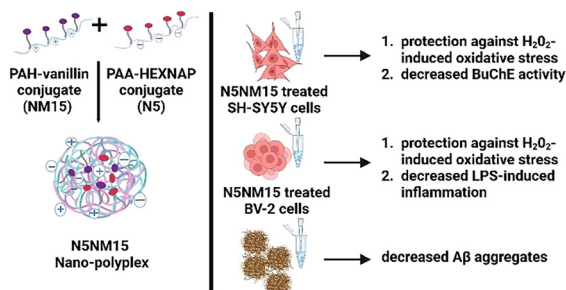
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### Utilization of a cadmium sulfide/nickel–ferric layered double hydroxide nanocomposite decorated with silver nanoparticles for efficient adsorption and photocatalytic degradation of 2,4-dichlorophenoxyacetic acid

Walaa A. Shaltout,\* Asaad F. Hassan, Maha S. Elsayed and H. Hafez



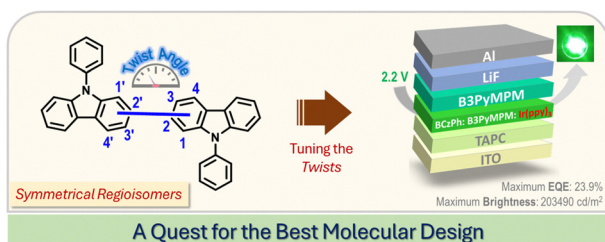
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### Development, characterisation and neuroprotective effects of polymer–drug conjugate nano-polyplex: working towards a multi-target treatment for neurodegenerative diseases

Nuruddin Mahadik, Gemma A. Barron, Paul Kong Thoo Lin and Colin J. Thompson\*

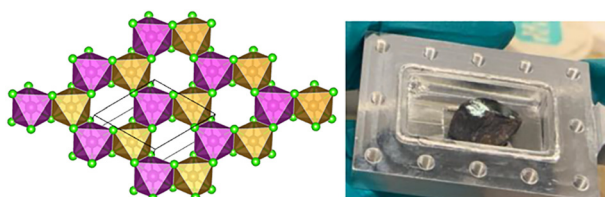
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### Connectivity and twist: engineering high-performance green phosphorescent OLEDs using unipolar symmetric bicarbazole regioisomers

Kalidass Kollimalaian, Jia-Fan Wu, Yu Hsuan Lin, Ya-Hsin Cheng, Premkumar Gnanasekaran, Sudhakar Maddala, Mandy M. Lee, Shih-Sheng Sun, Chih-Hao Chang,\* Yuan Jay Chang\* and Venkatakrisnan Parthasarathy\*

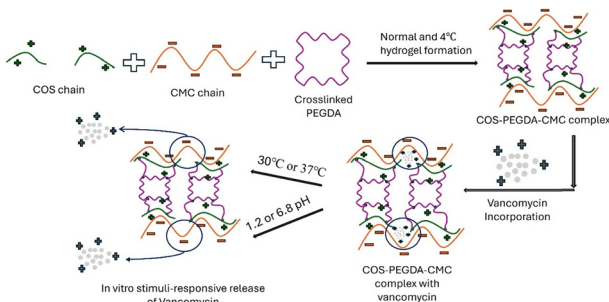
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### Magnetic properties of a non-centrosymmetric polymorph of $FeCl_3$

Joshua J. B. Levinsky, Ankit Labh, Vladimir Pomjakushin, Uwe Keiderling, Alexander C. Komarek, Li Zhao, Jacob Baas, Catherine Pappas and Graeme R. Blake\*

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### Effect of the temperature of biomixing on the pH/temperature sensitive controlled drug release of a chitooligosaccharide-based hydrogel

Mohammad Muhtasim Ittisaf, Md. Rakid-Ul-Haque, Nishat Tabassum, Mehedi Hasan Pritom, Md. Shad Hossain Tanvir, M. Azam Ali and Shoeb Ahmed\*

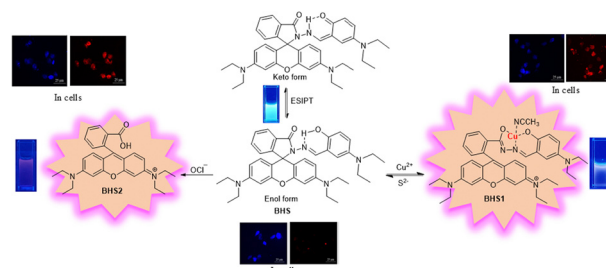




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### Fluorescence switching *via* competitive ESIPT and spirolactam ring opening in a multifunctional rhodamine B probe for selective detection of $\text{Cu}^{2+}$ and $\text{OCl}^-$ : theoretical insights with anticancer and biosensor activity

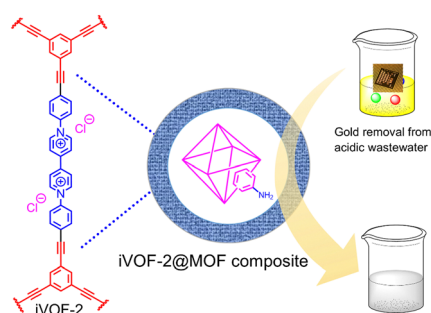
Vishnu S, Avijit Kumar Das,\* Gouri Karan and Sujata Maiti Choudhury



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### Gold recovery from acidic wastewater using ionic viologen organic and metal–organic framework composites

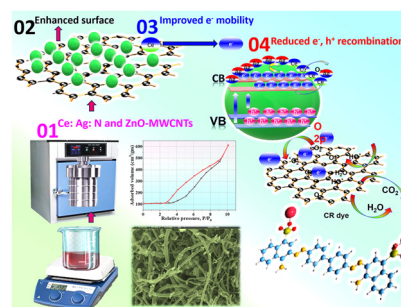
Sk Abdul Wahed, Atikur Hassan\* and Neeladri Das\*



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### Synergistic Ce/Ag/N-doped ZnO–MWCNT nanocomposites for efficient photocatalytic wastewater remediation with visible light

Manisha Dagar, Suresh Kumar, Amit Jain,\* Anil Vohra, Manohar Singh, Jasvir Dalal,\* Sanjeev Kumar and Sandeep Kaushal



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### Ni–NiCr nanoparticles incorporated carbon nanofibers as robust electrocatalysts for efficient glycerol oxidation

Nasser A. M. Barakat,\* Shima Hamada, Ibrahim Mustafa and Hesham Alhumade

