

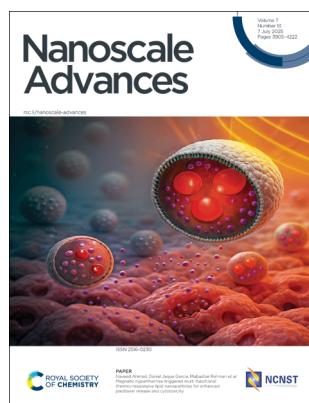
# Nanoscale Advances

An open access journal publishing across the breadth of nanoscience and nanotechnology  
[rsc.li/nanoscale-advances](https://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 7(13) 3905–4222 (2025)



### Cover

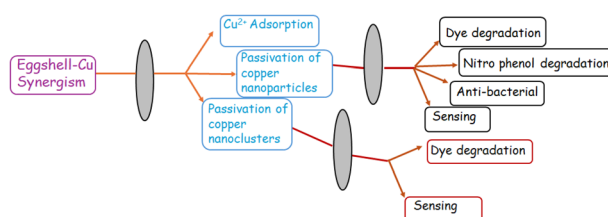
See Naveed Ahmed,  
Daniel Jaque Garcia,  
Mubashar Rehman *et al.*,  
pp. 4024–4038. Image  
reproduced by permission of  
Mubashar Rehman from  
Nanoscale Adv., 2025, 7, 4024.

## REVIEWS

3914

### Application of the synergism between eggshells and copper in nanotechnology

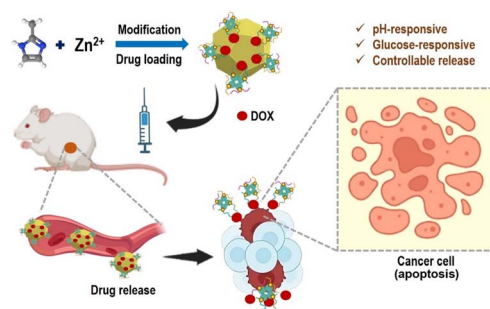
Priyanka Sharma, Mainak Ganguly\* and Ankita Doi



3941

### Synthesis methods, structure, and recent trends of ZIF-8-based materials in the biomedical field

Thuan Van Tran,\* Hoang Huy Dang, Huy Nguyen,  
Ngoan Thi Thao Nguyen, Dai Hai Nguyen  
and Thuy Thi Thanh Nguyen\*



**GOLD  
OPEN  
ACCESS**

# EES Solar

**Exceptional research on solar  
energy and photovoltaics**

Part of the EES family

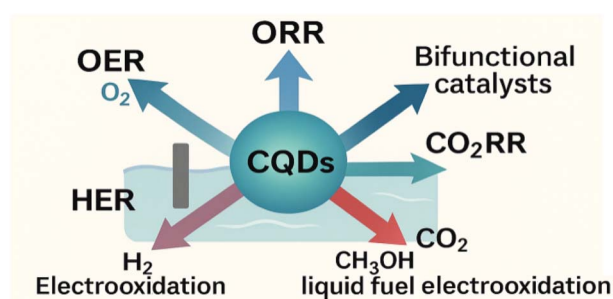
**Join  
in** | Publish with us  
[rsc.li/EESolar](https://rsc.li/EESolar)

## REVIEWS

3961

### Carbon quantum dots for sustainable energy: enhancing electrocatalytic reactions through structural innovation

Fadhel F. Sead, Yashwantsinh Jadeja, Anjan Kumar, Rekha M. M., Mayank Kundlas, Suman Saini, Kamal Kant Joshi and Hadi Noorizadeh\*

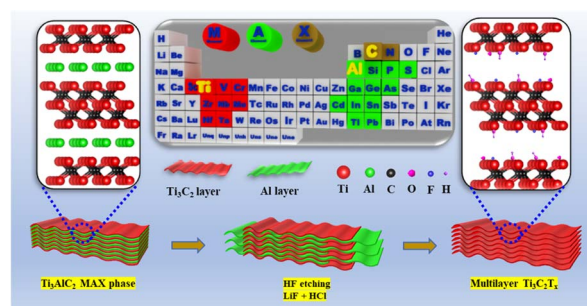


## MINIREVIEW

3999

### Recent progress in the synthesis of nanostructured $Ti_3C_2T_x$ MXene for energy storage and wastewater treatment: a review

Qui Thanh Hoai Ta, Jianbin Mao, Ngo Thi Chau, Ngoc Hoi Nguyen, Dieu Linh Tran, Thi My Huyen Nguyen, Manh Hoang Tran, Hoang Van Quy, Soonmin Seo\* and Dai Hai Nguyen\*

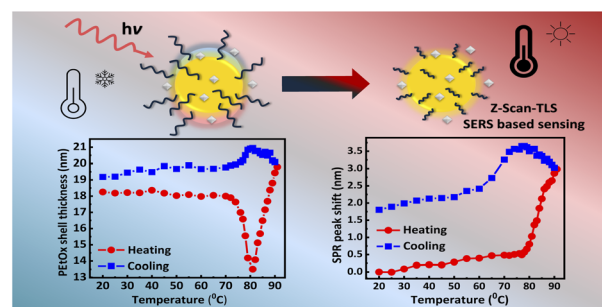


## COMMUNICATION

4018

### Plasmonic behaviour of poly(2-ethyl-2-oxazoline)-coated gold nanoparticles for sensing and temperature-control applications

Oleg Yeshchenko,\* Léa Daoud, Pavlo Khort, Oles Fedotov, Julien-Bilal Zinoune, Georges Boudebs, Tony Breton, Catherine Passirani, Patrick Saulnier and Oksana Krupka\*

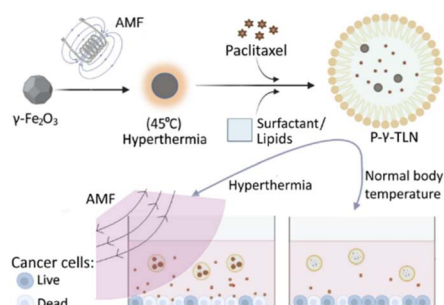


## PAPERS

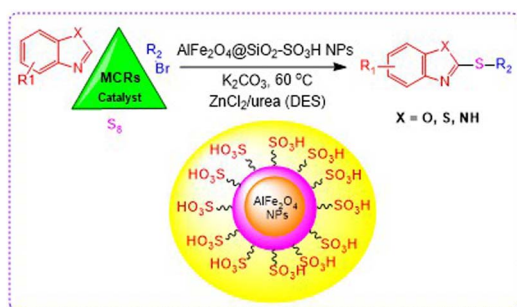
4024

### Magnetic hyperthermia-triggered multi-functional thermo-responsive lipid nanoparticles for enhanced paclitaxel release and cytotoxicity

Muhammad Tayyab, Naveed Ahmed,\* Muhammad Hisham Al Nasir, Ayesha Ihsan, Asim Ur Rehman, Khurram Shahzad Munawar, Daniel Jaque Garcia,\* Maria del Carmen Iglesias de la Cruz and Mubashar Rehman\*



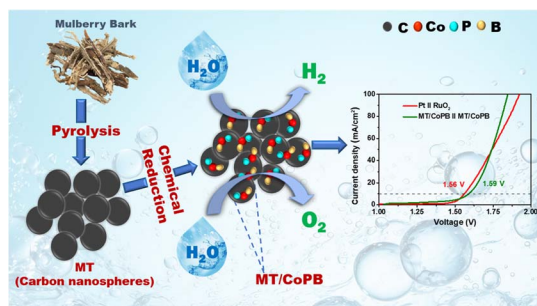
4039



### An $\text{AlFe}_2\text{O}_4@\text{SiO}_2\text{-SO}_3\text{H}$ innovative nanocatalyst: a sustainable approach for the A3 coupling reaction in a DES for 2-thioarylbenzoxazoles

Ahmad Sajjadi,\* Suranjana V. Mayani, Suhas Ballal, Shaker Al-Hasnaawei, Abhayveer Singh, Kattela Chennakesavulu and Kamal Kant Joshi

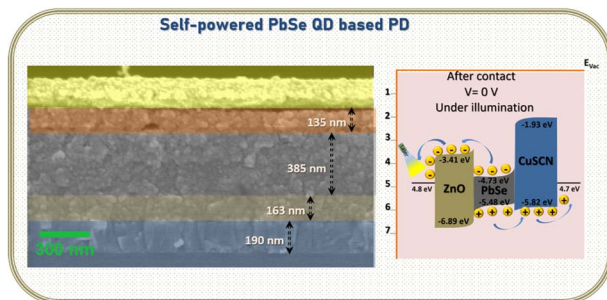
4056



### Biomass-derived carbon supported cobalt-phosphoride as a bifunctional electrocatalyst for enhanced alkaline water splitting

B. Sirichandana, R. Silviya, S. Venkataprasad Bhat, Nainesh Patel and Gurumurthy Hegde\*

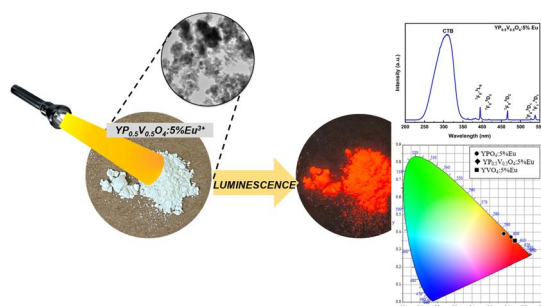
4067



### Self-powered, ultrabroad band photodetectors with large open circuit voltage using colloidal PbSe QDs

Yuquan Chen, Chandrasekar Perumalveeramalai, Chuanbo Li, S. V. N. Pammi, Jagadeesh Babu Bellam, Xiaoming Zhang\* and Peipei Ma\*

4077



### Structure, morphology, optical properties, and Judd-Ofelt analysis of $\text{YP}_{(1-x)}\text{V}_x\text{O}_4:\text{Eu}^{3+}$ materials synthesized by the combustion method

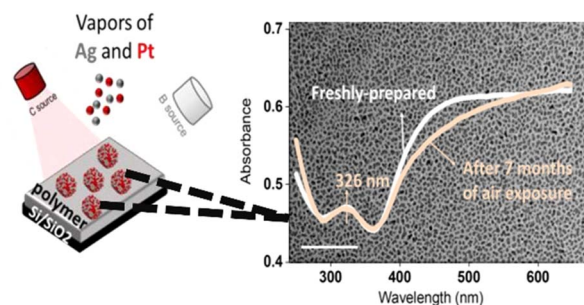
Nguyen Vu,\* Ngo Khac Khong Minh, Thai Thi Dieu Hien, Pham Duc Roan, Lam Thi Kieu Giang, Nguyen Thanh Huong, Hoang Thi Khuyen, Pham Thi Lien, Dinh Manh Tien, Nguyen Trung Kien\* and Dao Ngoc Nhiem



4087

### Polymer/AgPt bimetallic nanoparticle synergy: optimizing plasmonic durability through controlled synthesis and matrix integration

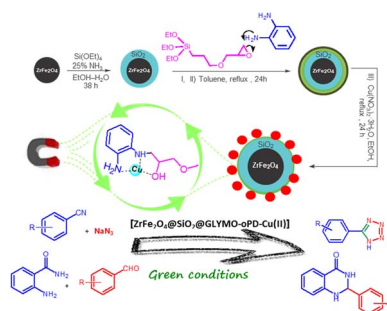
Abeer Fahes,<sup>\*</sup> Lavinia Balan, Caroline Andrezza-Vignolle, Claudia de Melo, Didier Zanghi and Pascal Andrezza<sup>\*</sup>



4104

### Copper(II) complex-decorated ZrFe<sub>2</sub>O<sub>4</sub> nanoparticles as a recyclable magnetic nanocatalyst for synthesis of N-containing heterocycles

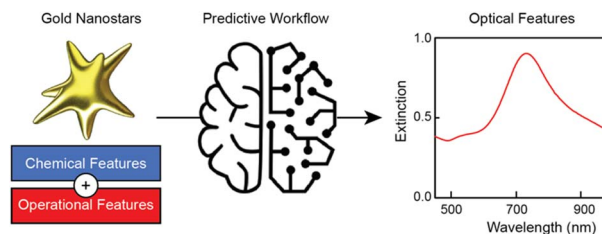
Tara Miladi and Masoomeh Norouzi<sup>\*</sup>



4117

### Machine learning to predict gold nanostar optical properties

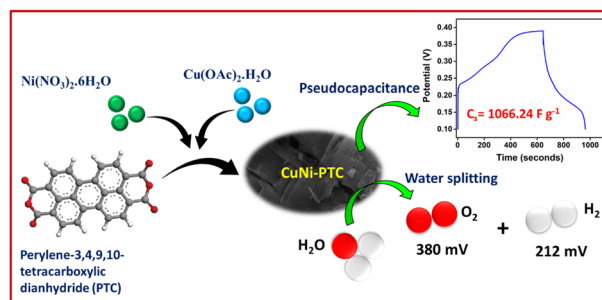
Peiyong Wu, Rui Zhang, Céline Porte, Fabian Kiessling, Twan Lammers, Sima Rezvantlab,<sup>\*</sup> Sara Mihandoost<sup>\*</sup> and Roger M. Pallares<sup>\*</sup>



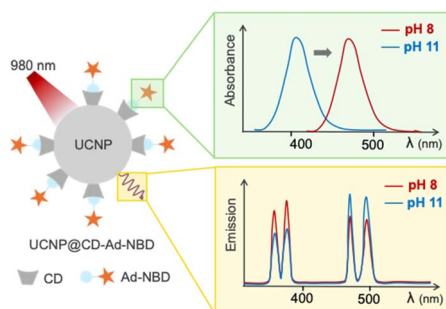
4129

### CuNi-PTC metal-organic framework: unveiling pseudocapacitive energy storage and water splitting capabilities

Samika Anand and Kalathiparambil Rajendra Pai Sunajadevi<sup>\*</sup>



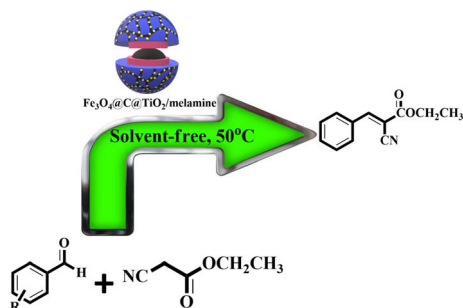
4142



### A host–guest approach to ratiometric pH sensing using upconversion nanoparticles

Ivo Rosenbusch, Marylyn Setsuko Arai, Fabio Rizzo,\*  
Andrea S. S. de Camargo\* and Bart Jan Ravoo\*

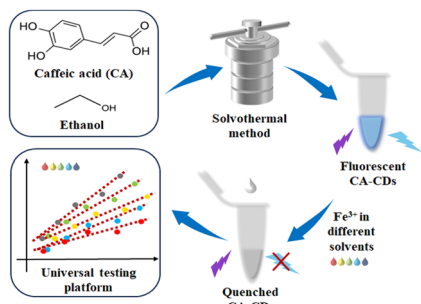
4152



### A melamine supported on TiO<sub>2</sub> coated Fe<sub>3</sub>O<sub>4</sub>@C nanocomposite as a bifunctional, effective and reusable catalyst for the Knoevenagel condensation reaction

Somayeh Abaezadeh, Alireza Salimi Beni\*  
and Aliyeh Barzkar

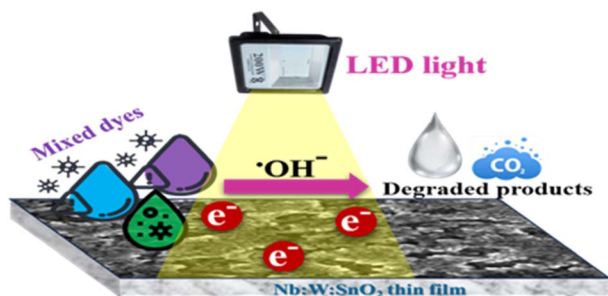
4161



### Sensitive, selective, and pretreatment-free detection of ferric ions in different solvents based on organic-soluble carbon dots

Jingfang Shangguan, Chengjie Qiao, Yuyang Zhang,  
Na Liu, Tongkun Wei, Zhuo Chen, Yuan Yuan, Qilu Li, Lin Li  
and Wei Liu\*

4169



### Photodegradation of mixed organic dyes using Nb and W co-doped spray coated transparent conducting SnO<sub>2</sub> thin films

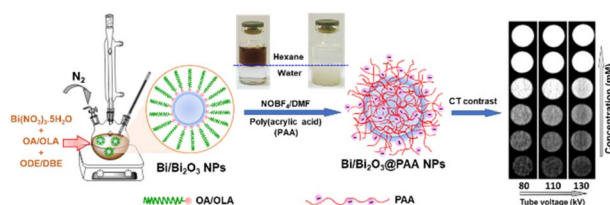
Gouranga Maharana, Yuvashree Jayavelu,  
Manavalan Kovendhan and D. Paul Joseph\*



4183

### Ultrasmall Bi/Bi<sub>2</sub>O<sub>3</sub> nanoparticles as biocompatible and efficient CT imaging contrast agents

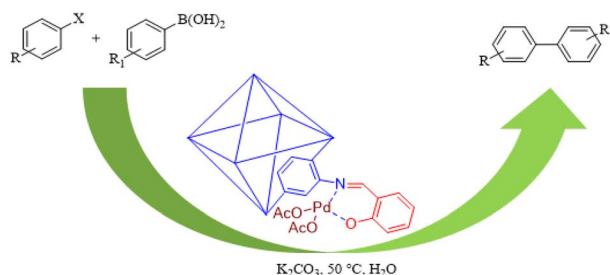
Le T. T. Tam, Duong T. Ngoc, Nguyen T. N. Linh, Le T. Tam, Nguyen V. Dong, Nguyen T. Yen, Nguyen T. Suong, Ngo T. Dung\* and Le T. Lu



4194

### UiO-66-NH<sub>2</sub> metal–organic framework supported palladium/Schiff-base complex as a highly efficient and robust catalyst for the Suzuki reaction

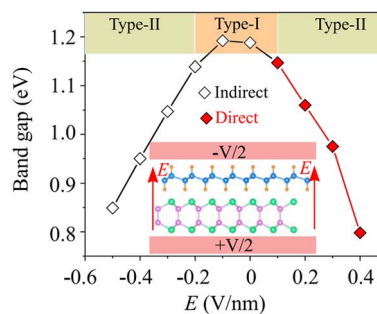
Shiva Kargar and Dawood Elhamifar\*



4205

### First-principles exploration of the electronic versatility of the GeH/SiSb heterostructure through stacking and electric fields

Nguyen Xuan Sang and Khang D. Pham\*



4214

### Giving new life to an outdated spectrofluorometer for static and time-resolved UCNP optical characterization

Tomás Di Napoli, Juan M. Bujjamer, Marcos Illescas, Beatriz Barja and Hernán E. Grecco\*

