

# Materials Advances

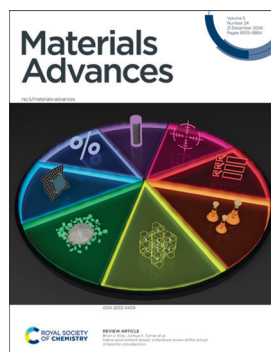
An open access journal publishing across the breadth of materials science

[rsc.li/materials-advances](https://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(24) 9505–9864 (2024)



### Cover

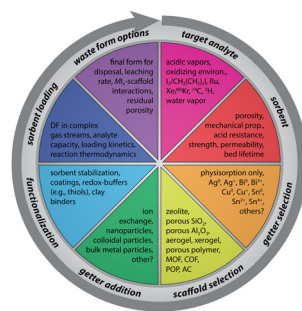
See Brian J. Riley,  
Joshua R. Turner *et al.*,  
pp. 9515–9547.  
Image reproduced  
by permission of  
Battelle Memorial Institute.

## REVIEWS

9515

### Iodine solid sorbent design: a literature review of the critical criteria for consideration

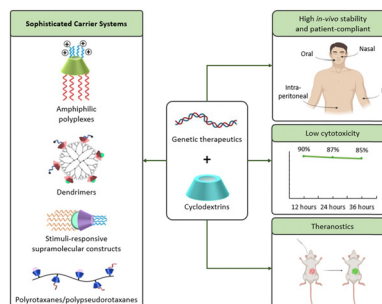
Brian J. Riley,\* Joshua R. Turner,\* Joanna McFarlane, Saehwa Chong, Krista Carlson and Josef Matyáš



9548

### Active transfection of genetic materials using cyclodextrin-anchored nanovectors

Amey Revdekar, Bhagyashree V. Salvi and Pravin Shende\*



**GOLD  
OPEN  
ACCESS**

# EES Solar

**Exceptional research on solar  
energy and photovoltaics**



Part of the EES family

**Join  
in**

Publish with us

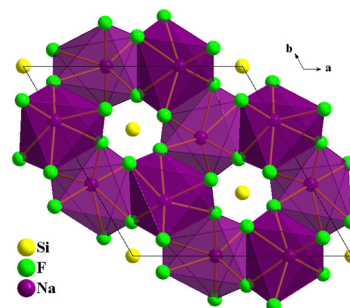
[rsc.li/EESolar](https://rsc.li/EESolar)

## COMMUNICATION

9565

### A deep-ultraviolet nonlinear-optical material with a wide bandgap and large static dielectric polarizability coefficient: $\text{Na}_6\text{Si}_3\text{F}_{18}$

Changcheng Tang,\* Xingxing Jiang, Xiuyu Wu, Yuechen Gong, Chao Yang, Ruixin Guo, Panpan Wang, Yongming Huang, Dakun Zhou, Huaiming Chen and Zheshuai Lin

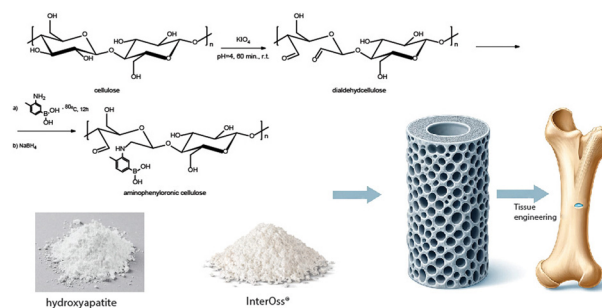


## PAPERS

9573

### Integrating hydroxyapatite and bovine bone mineral into cellulose–collagen matrices for enhanced osteogenesis

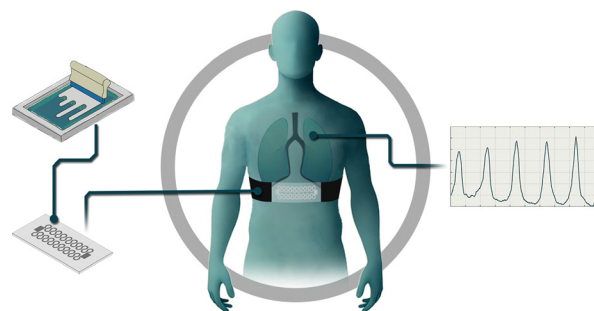
Tudor Pinteala, Paul-Dan Sirbu, Narcis Anghel,\* Irina Rosca, Geanina Voicu, Manuela Calin and Iuliana Spiridon



9586

### Screen-printed wearable sensors for continuous respiratory rate monitoring: fabrication, clinical evaluation, and point-of-care potential

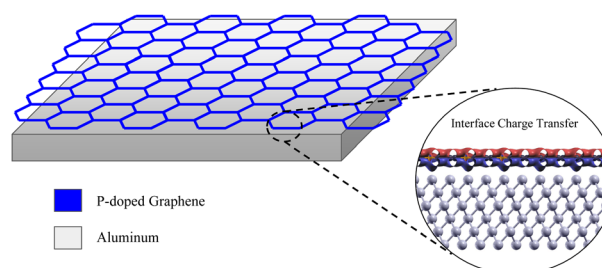
Ala'aldeen Al-Halhouli,\* Ahmed Albagdady, Alexander Rabadi, Musab Hamdan, Jumana Abu-Khalaf and Mahmoud Abu-Abeeleh



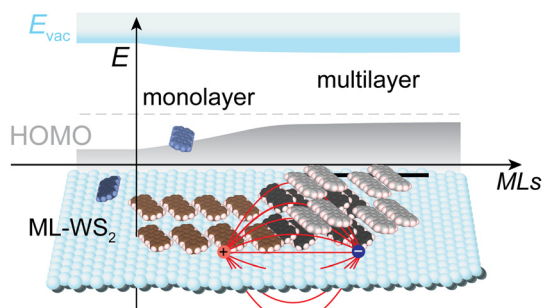
9596

### Reinforcement of aluminum metal matrix composites through graphene and graphene-like monolayers: a first-principles study

Ellie Zhang\* and Xuan Luo



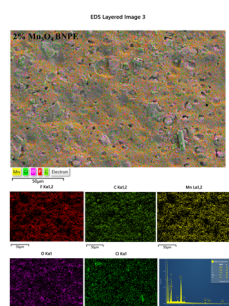
9604



### Terrylene on monolayer $WS_2$ : coverage-dependent molecular re-orientation and interfacial electronic energy levels

Qiang Wang, Sifan You, Björn Kobin, Patrick Amsalem, Fengshuo Zu, Rongbin Wang, Andreas Opitz, Stefan Hecht, Lifeng Chi and Norbert Koch\*

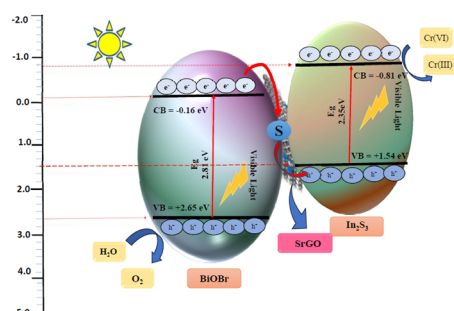
9613



### Enhancing lithium-ion conductivity: impact of hausmannite nanofiller on PVDF-HFP/PEG blend nanocomposite polymer electrolytes

Khizar Hayat Khan, Aneesa Zafar, Haroon Rashid, Iftikhar Ahmad, Gul Shahzada Khan and Hazrat Hussain\*

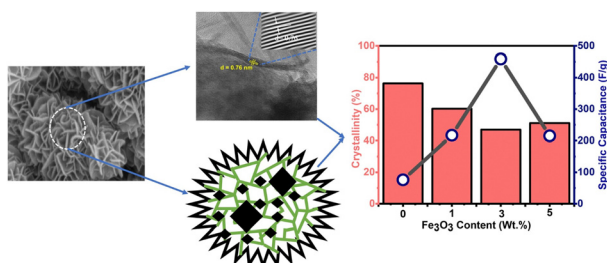
9626



### Treatment of chromium-contaminated water using a highly efficient, novel ternary synergistic S-rGO-BiOBr- $In_2S_3$ heterojunction

Satyanjib Sahoo, Naresh Kumar Sahoo,\*  
Prasanta Kumar Sahoo, Soumya Mishra, Arun Kumar, Brundabana Naik and Prangya Ranjan Rout

9641



### Disorder induced augmentation of the specific capacitance of $\delta$ - $MnO_2$ nanoflowers by incorporating $Fe_3O_4$ nanodiamonds for supercapacitor electrodes

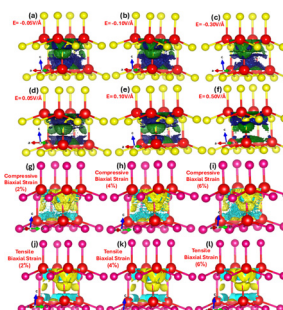
Md. Raihan Siddiki, Shahid Abubakar Abtahee, Mizanur Rahaman, Muhammad Rakibul Islam and Md. Abdullah Zubair\*



9656

## Electric field and strain mediated zinc blende ZnSe: exploring its potential as a controlled stimulus responsive optical and optoelectronic material

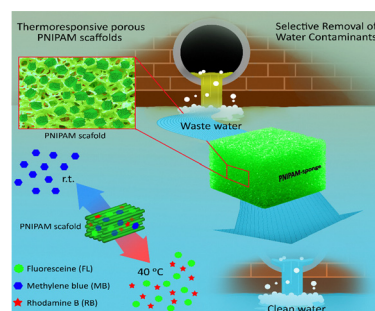
Fakhar E. Alam, Basharat Ali and Suneela Arif\*



9673

## Thermoresponsive scaffolds fabricated using covalent organic frameworks for the selective removal of water contaminants

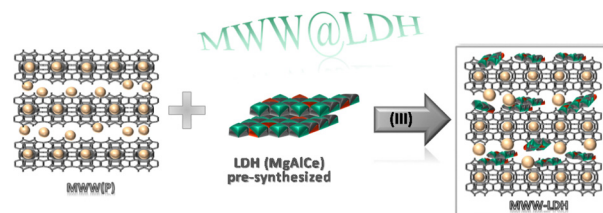
Safoora Gazvineh, Siamak Beyranvand, Sara Saki, Mohammad Nemat, Kai Ludwig, Patrick Amsalem, Thorstenn Schultz, Chong Cheng and Mohsen Adeli\*



9684

## Design and characterization of multi-component lamellar materials based on MWW-type zeolitic layers and metal oxide sub-domains

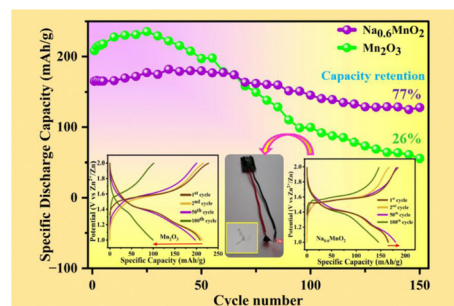
Cristina Esteban, Alexandra Velty\* and Urbano Díaz\*



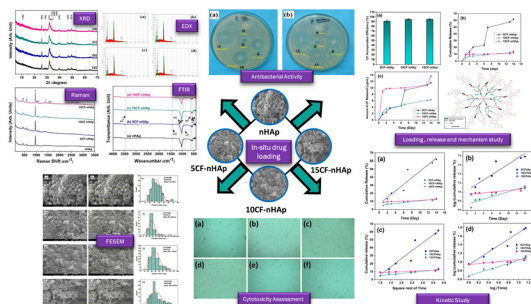
9699

## Enhancing the cycling performance of manganese oxides through pre-sodiation for aqueous Zn-ion batteries

Anjeline Williams and Prasanth Kumar Nayak\*



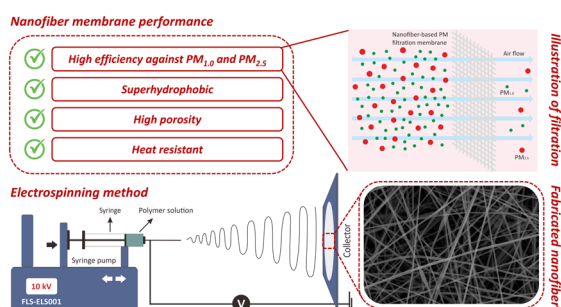
9716



### Poultry waste derived *in situ* drug loaded nano-hydroxyapatite bio-ceramic material for osteomyelitis treatment: *in vitro* drug release and biocompatibility studies

Mashrafi Bin Mobarak, Fariha Chowdhury, Md. Najem Uddin, Md. Sahadat Hossain, Umme Sarmeen Akhtar, Nazmul Islam Tanvir, Md Aftab Ali Shaikh\* and Samina Ahmed\*

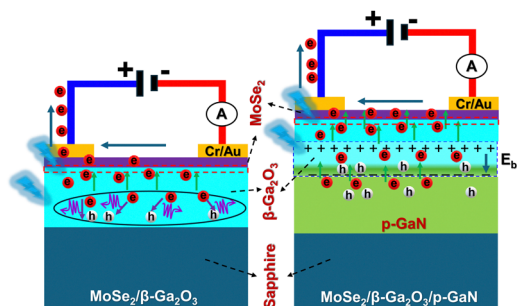
9731



### A superhydrophobic and heat-resistant PAN/PSU/PTFE composite nanofiber membrane for high-efficiency PM<sub>1.0</sub> and PM<sub>2.5</sub> filtration

Rizky Aflaha, Chlara Naren Maharani, Linda Ardita Putri, Yulian Dwi Prabowo, Iman Rahman, Tarmizi Taher, Aditya Rianjanu, Roto Roto, Hutomo Suryo Wasisto and Kuwat Triyana\*

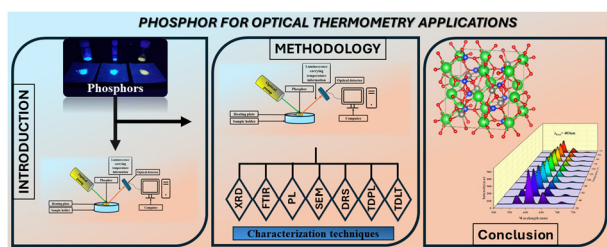
9744



### Unveiling the synergic potential of dual junction MoSe<sub>2</sub>/n-Ga<sub>2</sub>O<sub>3</sub>/p-GaN heterojunctions for ultra-broadband photodetection

Vishnu Aggarwal, Manish Kumar, Rahul Kumar, Sudhanshu Gautam, Aditya Yadav, Shikha Shrivastava, Anjana Dogra, Govind Gupta, Sumeet Walia and Sunil Singh Kushvaha\*

9756



### Structural, thermal, and optical spectroscopic studies of Sm<sup>3+</sup>-doped Ba<sub>2</sub>ZnSi<sub>2</sub>O<sub>7</sub> phosphors for optical thermometry applications

Tejas, A. Princy, S. Masilla Moses Kennedy, Vikash Mishra, M. I. Sayyed, Taha A. Hanafy and Sudha D. Kamath\*

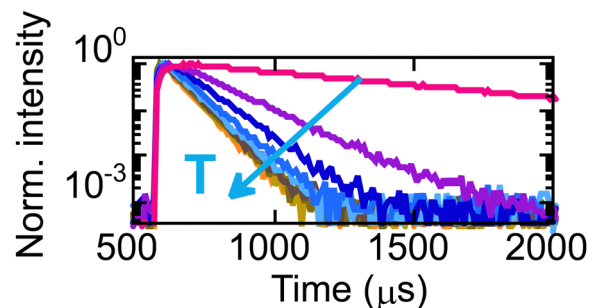


## PAPERS

9774

**Promising single crystal host for bulk scintillators: luminescence and energy migration in (Gd,Y)AlO<sub>3</sub>**

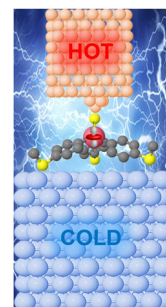
Monika Kotyková,\* Romana Kučerková, Alena Beitlerová, Vladimír Babin, Vítězslav Jarý, Jan Touš, Jan Polák, Karel Blažek and Martin Nikl



9781

**Thermoelectric signature of d-orbitals in tripod-based molecular junctions**

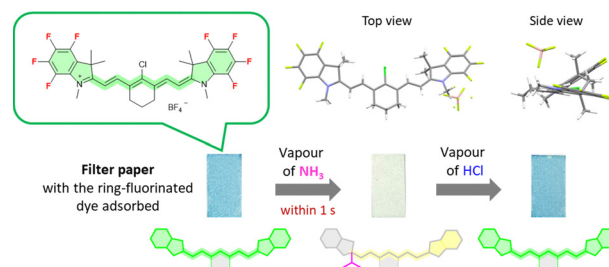
Oday A. Al-Owaedi,\* Hussein Neama Najeeb, Ahmed Kareem Obaid Aldulaimi, Nathera Hussin Alwan, Mohammed Shnain Ali, Majed H. Dwech and Muneer A. AL-Da'amy



9792

**A ring-fluorinated heptamethine cyanine dye: synthesis, photophysical properties, and vapochromic properties in response to ammonia**

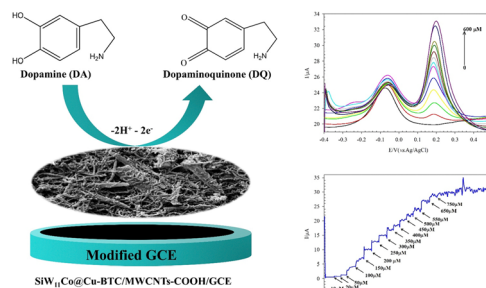
Shouhei Ajioka, Yuto Hagiya, Yuki Uehashi, Tomohiro Agou, Yasuhiro Kubota, Toshiyasu Inuzuka and Kazumasa Funabiki\*



9809

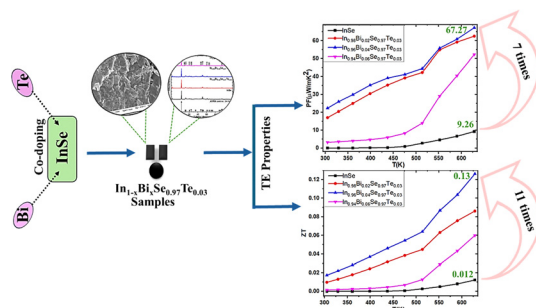
**A novel synthesis of inorganic–organic nanohybrid based on SiW<sub>11</sub>Co@Cu–BTC/MWCNTs–COOH for electrocatalytic oxidation of dopamine**

Zahra Sadeghi and Somayeh Dianat\*



## PAPERS

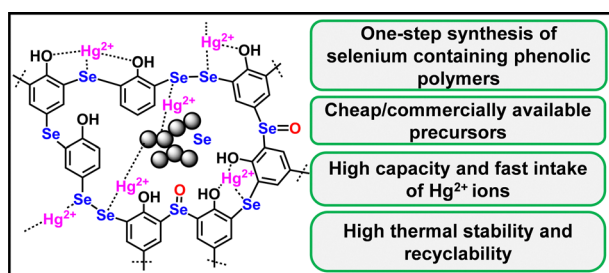
9823



### Bismuth and tellurium co-doping: a route to improve thermoelectric efficiency in InSe polycrystals

Manasa R. Shankar, A. N. Prabhu\* and Tulika Srivastava

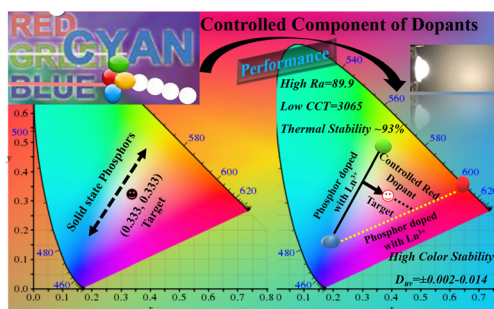
9838



### Arylselanyl motifs in hierarchically structured mesoporous phenolic polymers: efficient adsorption sites for Hg<sup>2+</sup> ions

Vishnu Selladurai and Selvakumar Karuthapandi\*

9851



### White light emission and superior color stability in a single-component host with exceptional eminent color rendering and theoretical calculations on $D_{uv}$ for color quality

Wasim Ullah Khan, Waheed Ullah Khan, Haris Zaman, Ayaz Mahsud, Dilfaraz Khan,\* Salim Ullah Khan, Shuakat Khan and Yueli Zhang\*

## CORRECTION

9862

### Correction: A perspective on contact-electro-catalysis based on frontier molecular orbitals

Ziming Wang, Xuanli Dong, Fu-Jie Lv and Wei Tang\*

