

# Materials Advances

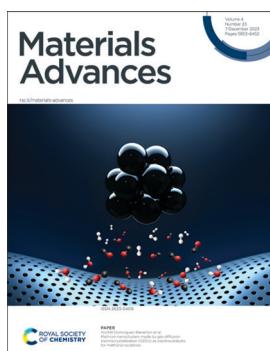
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## IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 4(23) 5853–6452 (2023)



### Cover

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### Inside cover

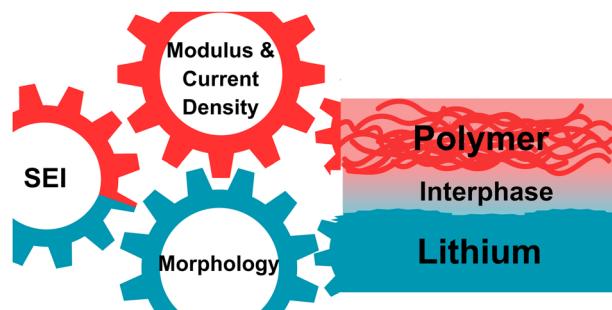
See Ashok M. Sajjan et al., pp. 6192–6198. Image reproduced by permission of Ashok M. Sajjan from *Mater. Adv.*, 2023, 4, 6192.

## PERSPECTIVE

5867

**Understanding and controlling lithium morphology in solid polymer and gel polymer systems: mechanisms, strategies, and gaps**

Kyra D. Owensby, Ritu Sahore, Wan-Yu Tsai and X. Chelsea Chen\*

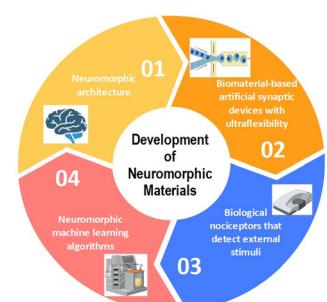


## REVIEWS

5882

**Computing of neuromorphic materials: an emerging approach for bioengineering solutions**

Chander Prakash,\* Lovi Raj Gupta, Amirinder Mehta, Hitesh Vasudev, Roman Tominov, Ekaterina Korman, Alexander Fedotov, Vladimir Smirnov and Kavindra Kumar Kesari\*



# Materials Advances

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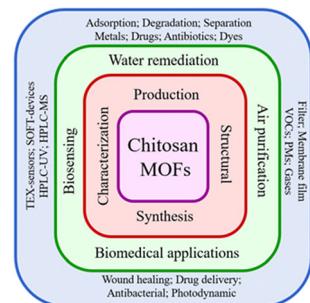


## REVIEWS

5920

## Chitosan/metal organic frameworks for environmental, energy, and bio-medical applications: a review

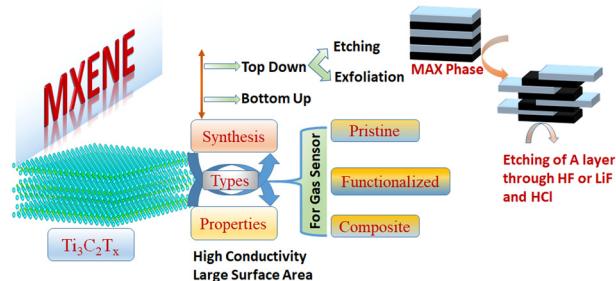
Akash Balakrishnan, Meenu Mariam Jacob, Nanditha Dayanandan, Mahendra Chinthalal,<sup>\*</sup> Muthamilselvi Ponnuchamy, Dai-Viet N. Vo,<sup>\*</sup> Sowmya Appunni and Adaikala Selvan Gajendhran



5948

## Unveiling the potential of $Ti_3C_2T_x$ MXene for gas sensing: recent developments and future perspectives

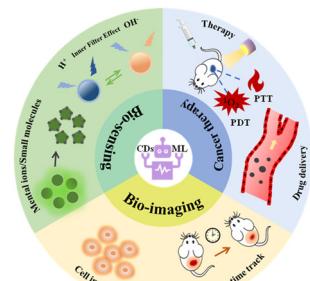
Nitesh K. Chourasia, Ankita Rawat, Ritesh Kumar Chourasia, Hemant Singh, Ramesh Kumar Kulriya, Vinod Singh and Pawan Kumar Kulriya\*



5974

## Utilizing machine learning to expedite the fabrication and biological application of carbon dots

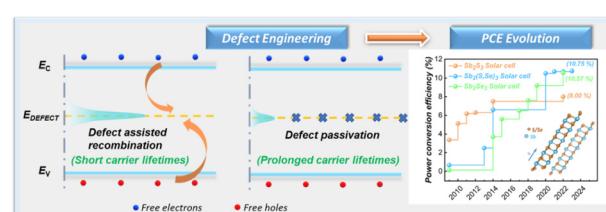
Yaoyao Tang, Quan Xu,\* Peide Zhu, Rongye Zhu and Juncheng Wang\*



5998

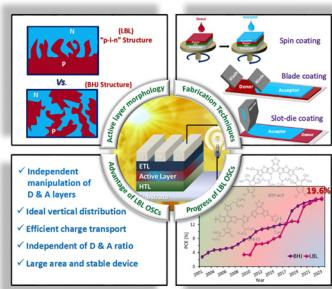
## A comprehensive insight into deep-level defect engineering in antimony chalcogenide solar cells

Swapnil Barthwal, Siddhant Singh, Abhishek K. Chauhan, Nimutha S. Prabhu, Akila G. Prabhudessai and K. Ramesh\*



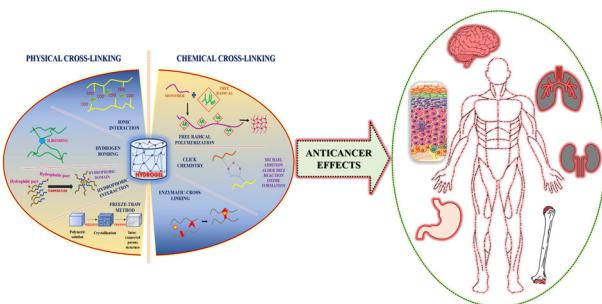
## REVIEWS

6031

**Advances in layer-by-layer processing for efficient and reliable organic solar cells**

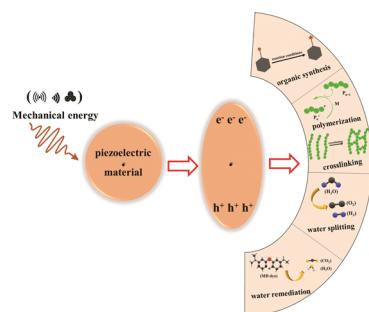
Amaresh Mishra,\* Nirmala Niharika Bhuyan, Haijun Xu and Ganesh D. Sharma\*

6064

**Natural cationic polymer-derived injectable hydrogels for targeted chemotherapy**

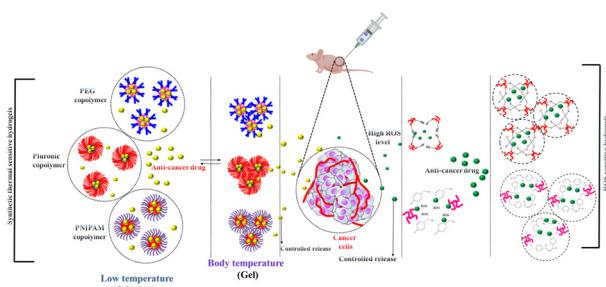
Sabya Sachi Das,\* Devanshi Sharma, Balaga Venkata Krishna Rao, Mandeep Kumar Arora, Janne Ruokolainen, Mukesh Dhanka, Hemant Singh and Kavindra Kumar Kesari\*

6092

**Electron/hole piezocatalysis in chemical reactions**

Shadi Asgari, Ghodsi Mohammadi Ziarani,\* Alireza Badiei\* and Siavash Iravani\*

6118

**Role of thermal and reactive oxygen species-responsive synthetic hydrogels in localized cancer treatment (bibliometric analysis and review)**

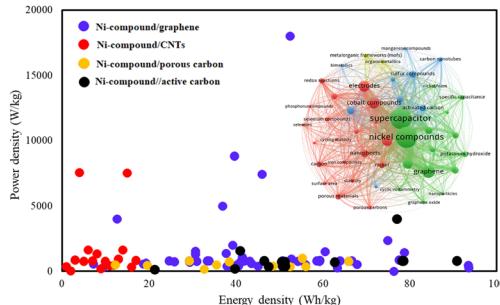
Yohannis Wondwosen Ahmed, Hsieh-Chih Tsai,\* Tsung-Yun Wu, Haile Fentahun Darge and Yu-Shuan Chen\*



6152

## Recent advances in Ni-materials/carbon nanocomposites for supercapacitor electrodes

Ghobad Behzadi Pour,\* Hamed Nazarpour Fard,  
Leila Fekri Aval and Deepak Dubal

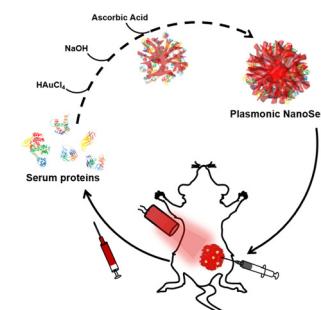


## COMMUNICATION

6175

# Plasmonic nanodendrites stabilized with autologous serum proteins for sustainable host specific photothermal tumor ablation

Mimansa, Smriti Bansal, Pranjali Yadav and Asifkhan Shanavas\*

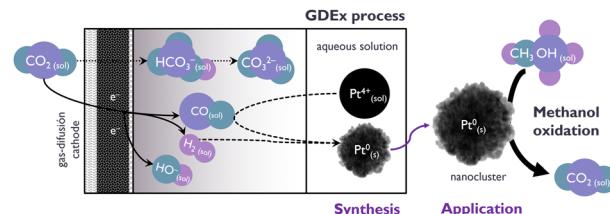


## PAPERS

6183

# Platinum nanoclusters made by gas-diffusion electrocrystallization (GDEx) as electrocatalysts for methanol oxidation

Omar Martinez-Mora, Luis F. Leon-Fernandez,  
Milica Velimirovic, Frank Vanhaecke, Kristof Tirez,  
Jan Fransaer and Xochitl Dominguez-Beneton\*

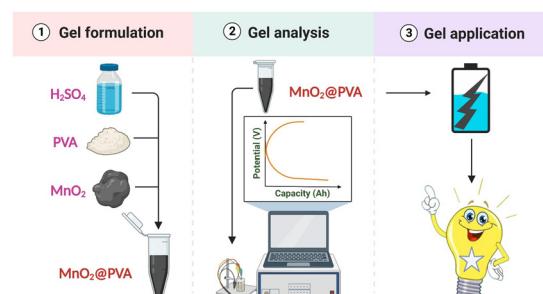


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6192

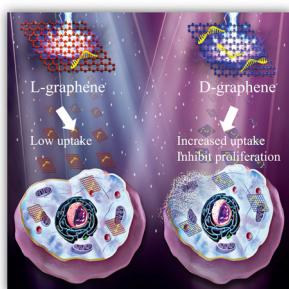
# The state of understanding of the electrochemical behaviours of a valve-regulated lead–acid battery comprising manganese dioxide-impregnated gel polymer electrolyte

Bipin S. Chikkatti, Ashok M. Sajjan\* and  
Naqarai R. Banapurmath



## PAPERS

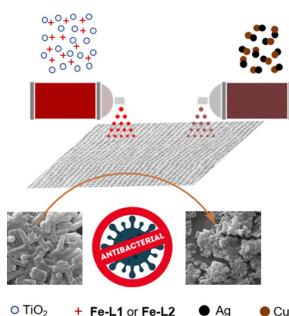
6199



### One-step simultaneous liquid phase exfoliation-induced chirality in graphene and their chirality-mediated microRNA delivery

Pranav, Eswara N. H. K. Ghali, Neeraj Chauhan, Rahul Tiwari, Marco Cabrera, Subhash C. Chauhan and Murali M. Yallapu\*

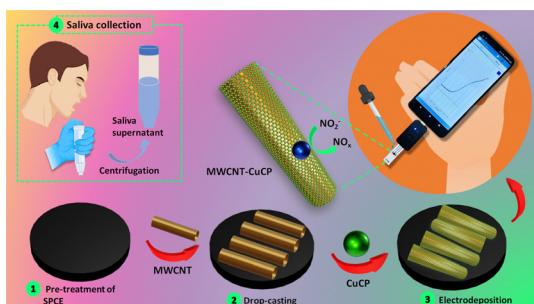
6213



### Oxide anchored multi-charged metal complexes with binary nanoparticles for stable and efficient anti-bacterial coatings on cotton fabrics

Anjali Nirmala, Suja Pottath, Adarsh Velayudhanpillai Prasannakumari, Valan Rebinro Gnanaraj, Jubi Jacob, B. S. Dileep Kumar, Saju Pillai, Rajeev Kumar Sukumaran,\* U. S. Hareesh,\* Ayyappanpillai Ajayaghosh\* and Sreejith Shankar\*

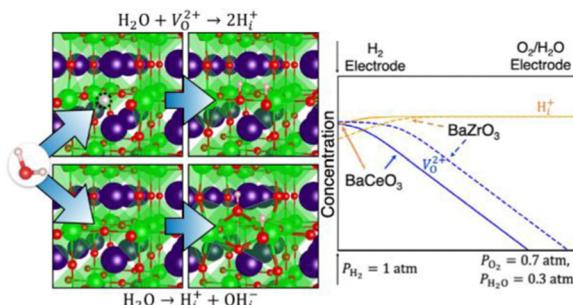
6223



### Enzyme mimetic electrochemical sensor for salivary nitrite detection using copper chlorophyllin and carbon nanotubes-functionalized screen printed electrodes

Sriraja Subhasri Paramasivam, Siva Ananth Mariappan, Niroj Kumar Sethy and Pandiaraj Manickam\*

6233



### Incorporation of protons and hydroxide species in $\text{BaZrO}_3$ and $\text{BaCeO}_3$

Andrew J. E. Rowberg,\* Meng Li, Tadashi Ogitsu and Joel B. Varley

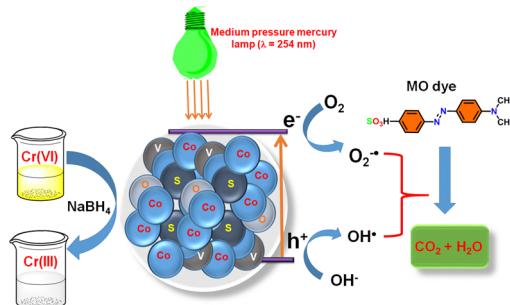


## PAPERS

6244

**Cobalt oxide decked with inorganic-sulfur containing vanadium oxide for chromium(vi) reduction and UV-light-assisted methyl orange degradation**

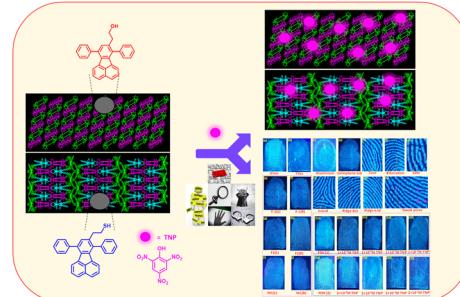
Sayanika Saikia, Manoshi Saikia, Salma A. Khanam, Seonghwan Lee, Young-Bin Park, Lakshi Saikia, Gautam Gogoi and Kusum K. Bania\*



6259

**Fluoranthene-based derivatives for multimodal anti-counterfeiting and detection of nitroaromatics**

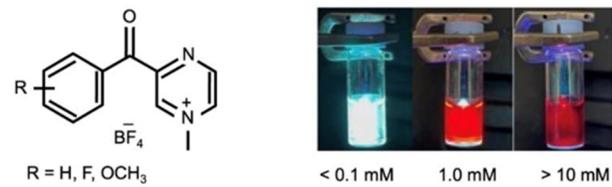
Kasthuri Selvaraj, Prasanth Palanisamy, Marimuthu Manikandan, Praveen B. Managutti, Palanivelu Sangeetha, Sharmarke Mohamed, Rajesh Pamanji, Joseph Selvin, Sohrab Nasiri, Stepan Kment and Venkatramaiyah Nutalapati\*



6271

**Concentration-dependent emission from low molecular weight benzoyl pyrazinium salts**

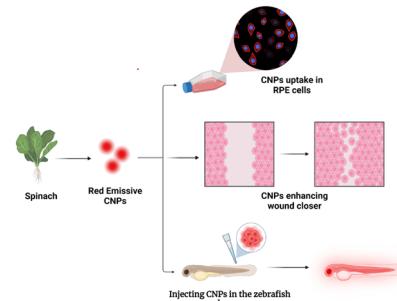
Ryan P. Brisbin, Arya Karappilly Rajan, Md. Imran Khan, Pravien S. Rajaram, Karen M. Russell, Sayantani Ghosh\* and Ryan D. Baxter\*



6277

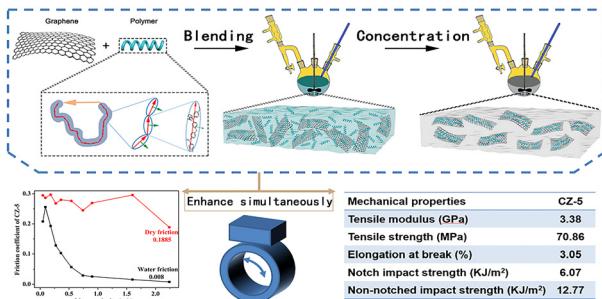
**Red fluorescent carbon nanoparticles derived from *Spinacia oleracea L.*: a versatile tool for bioimaging and biomedical applications**

Ketki Barve, Udit Singh, Pankaj Yadav, Krupa Kansara, Payal Vaswani, Ashutosh Kumar and Dhiraj Bhatia\*



## PAPERS

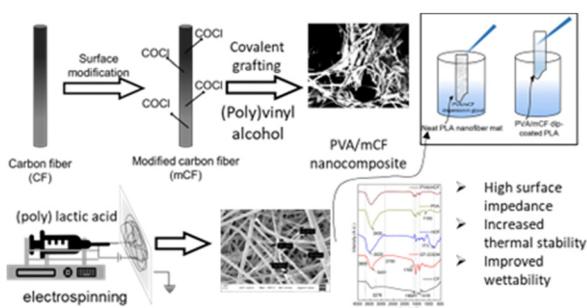
6286



**Uniformly distributed graphite with dual attributes to achieve enhanced mechanical and tribological properties of PEK-C/graphite composites *via* a precipitation method**

Zengwen Cao, Zhipeng Wang\* and Guangyuan Zhou\*

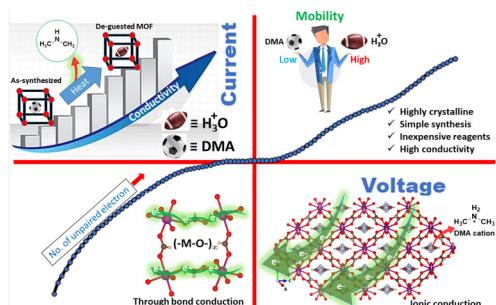
6294



**Fabrication and characterization of conductive electrospun nanofiber mats of carbon nanofiber/poly(vinyl alcohol)/poly(lactic acid) ternary nanocomposites for flexible electronics applications**

Victor K Sharma, Gourhari Chakraborty, Soundararajan Narendren and Vimal Katiyar\*

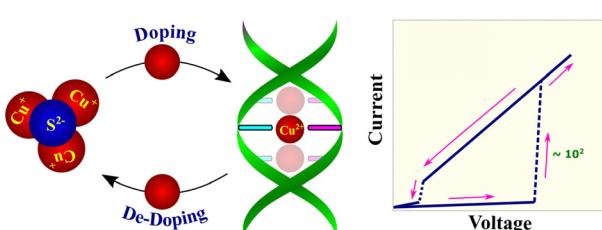
6304



**Highly conductive three-dimensional metal organic frameworks from small *in situ* generated ligands**

Uddit Narayan Hazarika, Jhorna Borah, Arobinda Kakoti, Rinki Brahma, Kangkan Sarmah, Ankur Kanti Guha and Prithiviraj Khakhlay\*

6312



**Soft grafting of DNA over hexagonal copper sulfide for low-power memristor switching**

Smita Gajanan Naik, M. K. Rabinal\* and Shouvik Datta

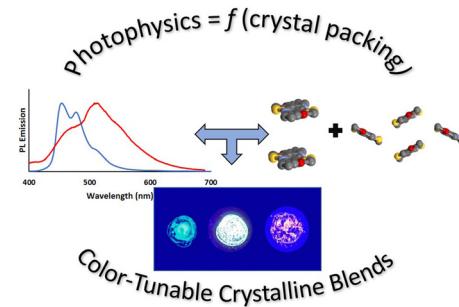


## PAPERS

6321

**Correlating structure and photophysical properties in thiazolo[5,4-*d*]thiazole crystal derivatives for use in solid-state photonic and fluorescence-based optical devices**

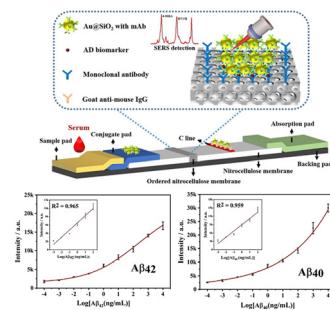
Abhishek Shibu, Sean Jones, P. Lane Tolley, David Diaz, Carly O. Kwiatkowski, Daniel S. Jones, Jessica M. Shivas, Jonathan J. Foley IV, Thomas A. Schmedake and Michael G. Walter\*



6333

**A nanostructured lateral flow immunoassay strip combined with Au@SiO<sub>2</sub> SERS nanotags for multiplex biomarker detection**

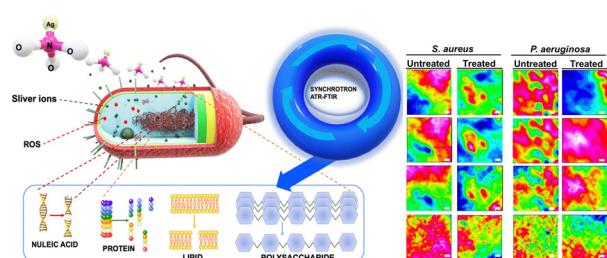
Geng Zhu, Yuanbao Zhan, Yu Lu, Fei Zheng, Yu Wan, Bing Liu, Xi Yang, Yanhui Wan, Qingjiang Sun, Jingjie Sha, Yan Huang\* and Xiangwei Zhao\*



6342

**Synchrotron macro ATR-FTIR micro-spectroscopy to unlock silver ion-induced biochemical alterations in bacteria**

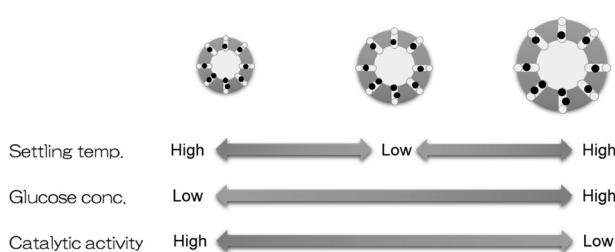
Tien Thanh Nguyen, Ngoc Huu Nguyen, Giang Tuyet Pham, Jitraporn Vongsivut, Melissa H. Brown, Vi Khanh Truong\* and Krasimir Vasilev\*



6353

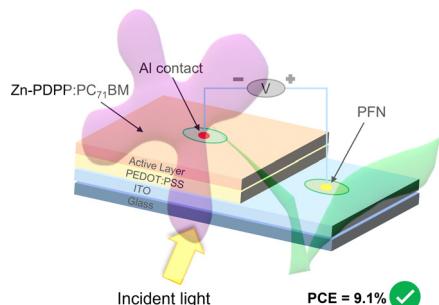
**The particle size control of ruthenium-encapsulated hollow silica sphere catalysts for the hydrogenation of carbon dioxide into formic acid**

Tetsuo Umegaki,\* Eiji Nagakubo, Kenjiro Saeki and Yoshiyuki Kojima



## PAPERS

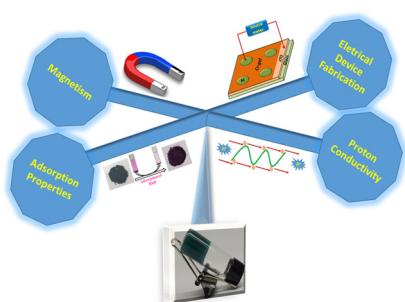
6358



**Aza-benzannulated-perylenebisimide-porphyrin dyad as an intensely absorbing donor in bulk-heterojunction organic solar cells**

Ayushi Kaushik, Subhrajyoti Bhandary, Ganesh D. Sharma\* and Jeyaraman Sankar\*

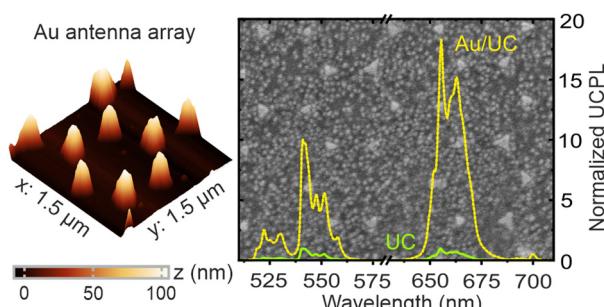
6367



**The synthesis and combined electrical-magnetic and toxic dye sequestration properties of a Cr(III)-metallogel**

Krishna Sundar Das, Mainak Das, Sayan Saha, Amit Adhikary, Sukhen Bala, Partha Pratim Ray\* and Raju Mondal\*

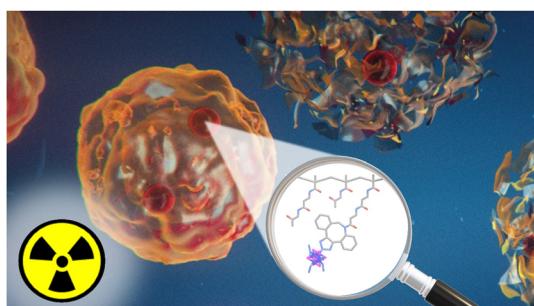
6381



**Enhancement of upconversion photoluminescence in phosphor nanoparticle thin films using metallic nanoantennas fabricated by colloidal lithography**

Thi Tuyen Ngo, Jose M. Viaña, Manuel Romero, Mauricio E. Calvo, Gabriel Lozano\* and Hernán Míguez\*

6389



**Radiosensitizing molybdenum iodide nanoclusters conjugated with a biocompatible *N*-(2-hydroxypropyl)methacrylamide copolymer: a step towards radiodynamic therapy**

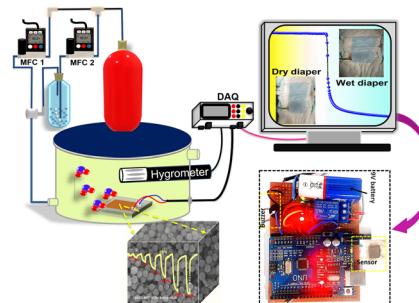
Kaplan Kirakci,\* Robert Pola,\* Marina Rodrigues Tavares, Michal Pechar, Tomáš Přibyl, Ivana Křížová, Jaroslav Zelenka, Tomáš Ruml, Tomáš Etrych and Kamil Lang

## PAPERS

6396

**The emergence of  $\text{MnFe}_2\text{O}_4$  nanosphere-based humidity sensor: a methodical investigation by scanning Kelvin probe and its deployment in multitudinous applications**

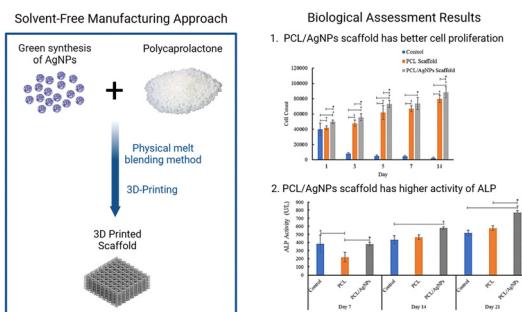
Rahul S. Ghuge, Manish D. Shinde, V. Hajeesh Kumar, Sudhir S. Arbjur, Velappa Jayaraman Surya, Sunit B. Rane,\* Corrado Di Natale and Yuvaraj Sivalingam\*



6407

**Osteogenic potential of a 3D printed silver nanoparticle-based electroactive scaffold for bone tissue engineering using human Wharton's jelly mesenchymal stem cells**

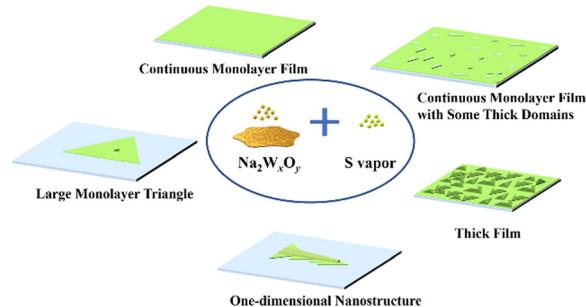
Mira Mira, Arie Wibowo,\* Gusti Umindya Nur Tajalla, Glen Cooper, Paulo Jorge Da Silva Bartolo and Anggraini Barlian\*



6419

**Further insights into the  $\text{Na}_2\text{WO}_4$ -assisted synthesis method for  $\text{WS}_2$**

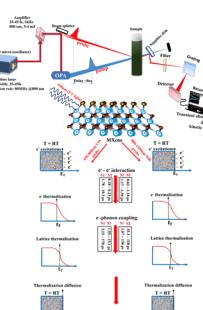
Changyong Lan,\* Xinyu Jia, Yiyang Wei, Rui Zhang, Shaofeng Wen, Chun Li, Yi Yin and Johnny C. Ho



6427

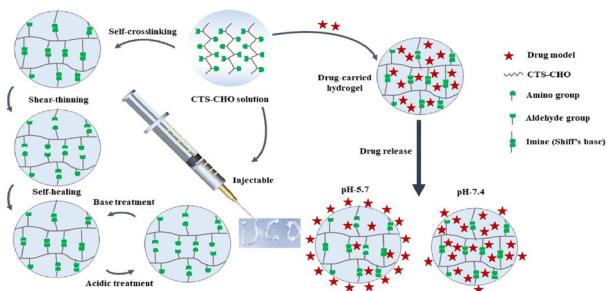
**Investigation of charge carrier dynamics in a  $\text{Ti}_3\text{C}_2\text{T}_x$  MXene for ultrafast photonics applications**

Ankita Rawat, Nitesh K. Chourasia, Saurabh K. Saini, Gaurav Rajput, Aditya Yadav, Ritesh Kumar Chourasia, Govind Gupta and P. K. Kulriya\*



## PAPERS

6439



## Stimuli-responsive chitosan-based injectable hydrogel for “on-demand” drug release

Xiaoyu Wang, Melissa Johnson, Nan Zhang, Pingping Shen, Lizhu Yang, Cameron Milne, Irene Lara-Sáez, Rijian Song,\* Sigen A\* and Wenxin Wang

## CORRECTION

6449

## Correction: DFT investigation of the oxygen reduction reaction over nitrogen (N) doped graphdiyne as an electrocatalyst: the importance of pre-adsorbed OH\* and the solvation effect

Yuelin Wang, Thanh Ngoc Pham, Harry H. Halim, Likai Yan and Yoshitada Morikawa\*

