

# Materials Advances

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## IN THIS ISSUE

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### Cover

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### Inside cover

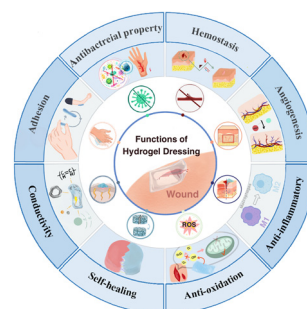
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### Decoding eumelanin's spin label signature: a comprehensive EPR analysis

João V. Paulin,\* Carlos F. O. Graeff\* and  
A. Bernardus Mostert\*



# RSC Applied Polymers

The application of polymers,  
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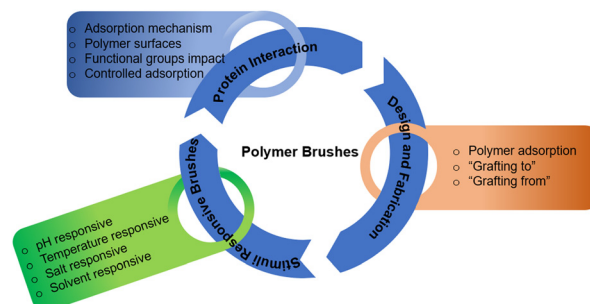
Fundamental questions  
Elemental answers

## REVIEWS

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### Mixed polymer brushes for controlled protein adsorption: state of the art and future prospective

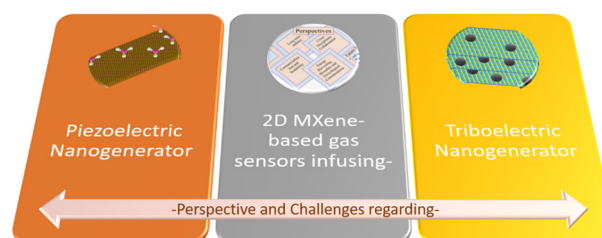
Muhammad Atif\* and Ali Balasini



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### Perspectives of 2D MXene-based materials for self-powered smart gas sensors

Sayali Atkare, Chandra Sekhar Rout\* and Shweta Jagtap\*

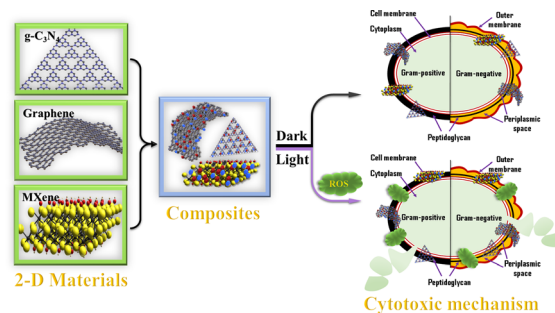


## PERSPECTIVE

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### Carbon-based two-dimensional (2D) materials: a next generation biocidal agent

Neetu Talreja,\* Divya Chuahan and Mohammad Ashfaq\*

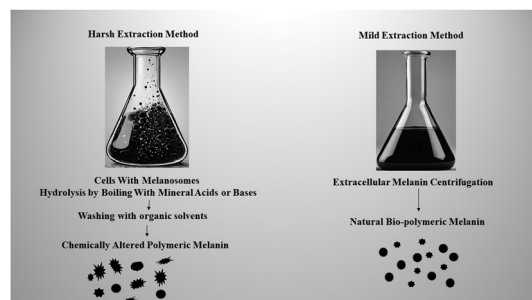


## COMMUNICATIONS

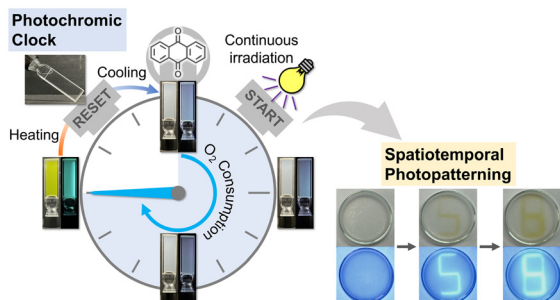
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### One-pot synthesis of black biopolymeric eumelanin pigment by indigenous salt-tolerant *Pseudomonas stutzeri* SGM-1

Swapnil G. Mahajan,\* Vinod S. Nandre, Kisan M. Kodam and Mohan V. Kulkarni



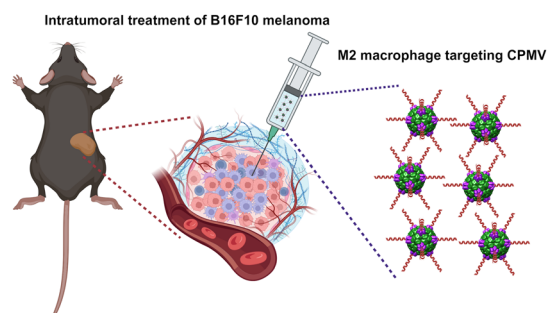
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### Photochromic clock reaction of anthraquinone in supramolecular gel and its application to spatiotemporal patterning

Sota Fujisaki, Yuki Nagai,\* Yoshinori Okayasu and Yoichi Kobayashi\*

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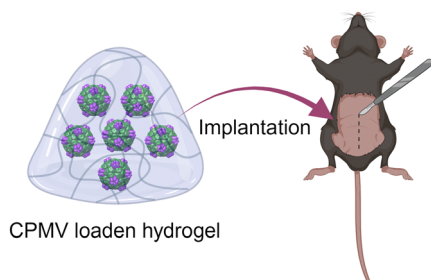


### Melanoma immunotherapy enabled by M2 macrophage targeted immunomodulatory cowpea mosaic virus

Zhongchao Zhao, Young Hun Chung and Nicole F. Steinmetz\*

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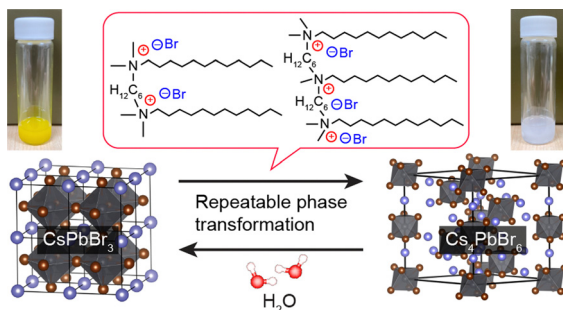
### Prevention of Ovarian Cancer Recurrence



### 3D bioprinting cowpea mosaic virus as an immunotherapy depot for ovarian cancer prevention in a preclinical mouse model

Zhongchao Zhao, Yi Xiang, Edward C. Koellhoffer, Sourabh Shukla, Steven Fiering, Shaochen Chen\* and Nicole F. Steinmetz\*

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### Phase transformation between CsPbBr<sub>3</sub> and Cs<sub>4</sub>PbBr<sub>6</sub> nanocrystals by a cationic oligomeric ligand and water, and their water resistance

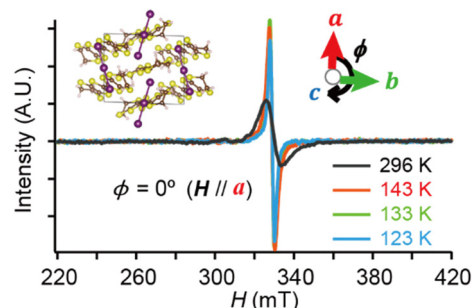
Norio Saito,\* Akihiro Urayama, Takahiro Takei and Nobuhiro Kumada



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### Nearly three-dimensional Dirac fermions in an organic crystalline material unveiled by electron spin resonance

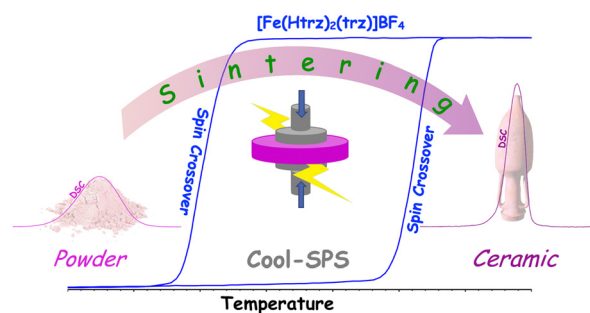
Ryuhei Oka, Keishi Ohara, Naoya Tajima, Toshihiro Shimada and Toshio Naito\*



1502

### Spin crossover molecular ceramics by Cool-SPS: consequences on switching features beyond microstructural effects

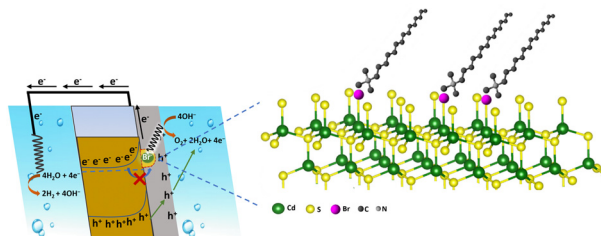
Liza El-Khoury, Nathalie Daro, Guillaume Chastanet, Patrick Rosa, Dominique Denux, Laetitia Etienne, Vincent Mazel, Michael Josse\* and Mathieu Marchivie\*



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### Profound influence of surface trap states on the utilization of charge carriers in CdS photoanodes

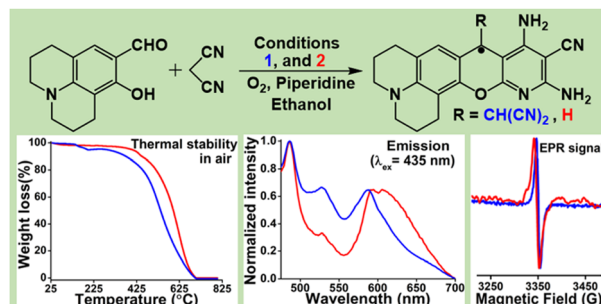
Elif Öykü Alagöz, Hadi Jahangiri and Sarp Kaya\*



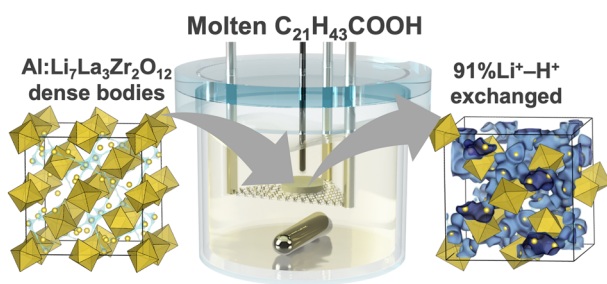
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### One pot oxygen mediated syntheses of stable radicals

Mohit Kulshrestha, C. N. Ramachandran,\* Rajesh G. Gonnade\* and Kalyan K. Sadhu\*



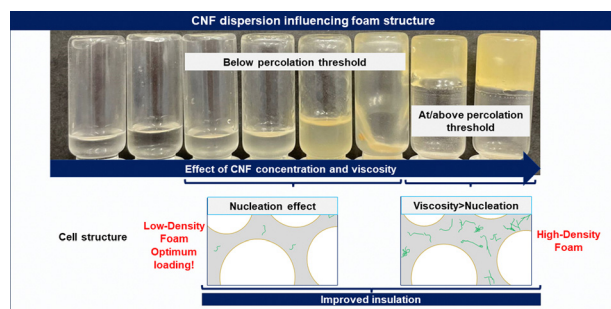
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### Proton conductivity of Li<sup>+</sup>-H<sup>+</sup> exchanged Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> dense membranes prepared by molten long-chain saturated fatty acids

Akihiro Ishii,\* Daisuke Kume, Shoki Nakayasu, Itaru Oikawa, Hiroshi Matsumoto, Hisashi Kato and Hitoshi Takamura

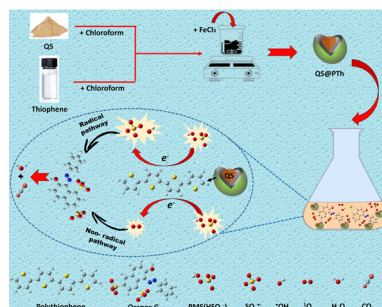
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### Dispersion engineering of cellulose nanofibres in polyols: for controlled microstructure of high-performance polyurethane foam

Hima Haridevan, David A. C. Evans, Darren J. Martin and Pratheep K. Annamalai\*

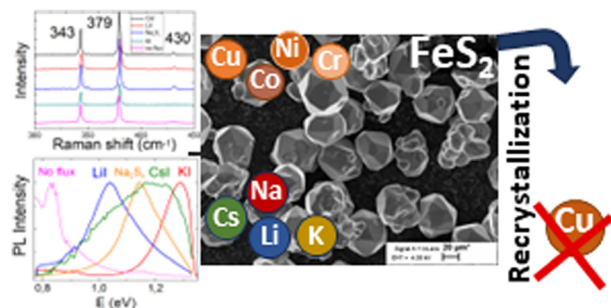
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### Efficient degradation of orange G dye using the quartz-sand@polythiophene composite for peroxydisulfate activation: a sustainable approach for advanced oxidation processes

Asma Amjlef,\* Abdellah Ait El Fakir, Salaheddine Farsad, Aboubakr Ben Hamou, Ayoub Chaoui, Saïd Et-Taleb\* and Nouredine El Alem

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### Characterization of FeS<sub>2</sub> pyrite microcrystals synthesized in different flux media

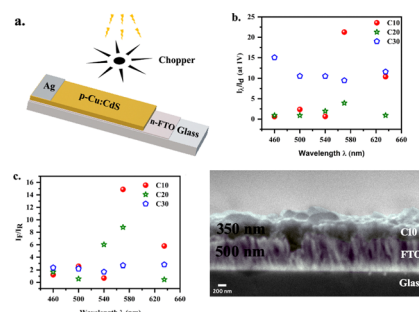
Katriin Kristmann,\* Taavi Raadik, Mare Altosaar, Mati Danilson, Jüri Krustok, Peeter Paaver and Yuriy Butenko



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### Fast response and multi-color photodetection in p-type Cu:CdS thin films

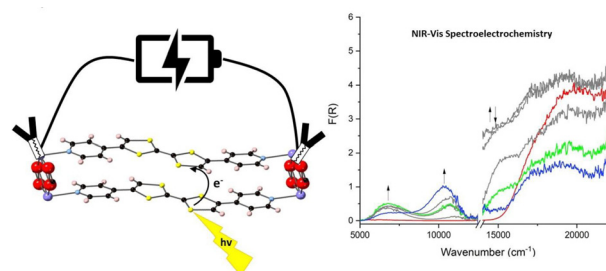
Ganesha Krishna V. S., Pawan Kumar, Gowrish Rao K. and Mahesha M. G.\*



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### The spatial dependence of intervalence charge transfer in an electroactive metal–organic framework

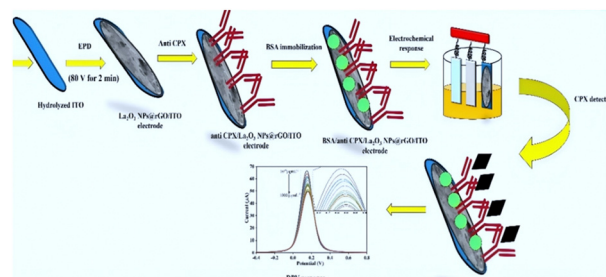
Eleanor R. Kearns, Bun Chan, Hunter J. Windsor, William Lewis and Deanna M. D'Alessandro\*



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### An electrochemical immunosensor based on a nanostructured lanthanum oxide-substituted reduced graphene oxide interface for ultralow ciprofloxacin detection in milk samples

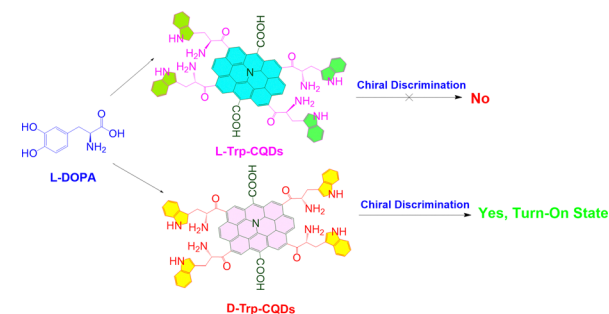
Navneet Chaudhary, Amit K. Yadav, Damini Verma, Jai Gopal Sharma and Pratima R. Solanki\*



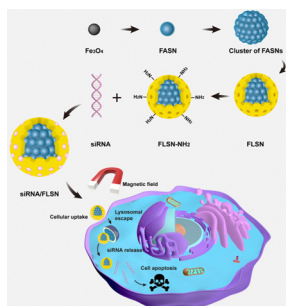
1614

### Chiral discrimination of L-DOPA via L/D-tryptophan decorated carbon quantum dots

Aram Rezaei,\* Mohammed Ahmed Hamad, Hadi Adibi, Huajun Zheng and Khdir Hamza Qadir



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### Development of magnetic nanoparticles with double silica shells of different porosities for efficient siRNA delivery to breast cancer cells

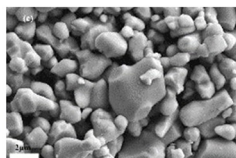
Qing Bao, Xiangyu Liu, Yan Li, Tao Yang, Hui Yue, Mingying Yang\* and Chuanbin Mao\*

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Silver paint

Ti<sub>2</sub>O<sub>3</sub> film  
(1×2.5cm)

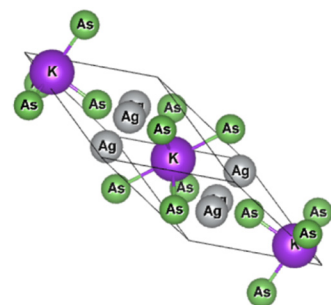
FTO glass



### Ti<sub>2</sub>O<sub>3</sub> film electrode for water treatment via electrochemical chlorine evolution

Yishu Zhang, Caroline Kirk\* and Neil Robertson\*

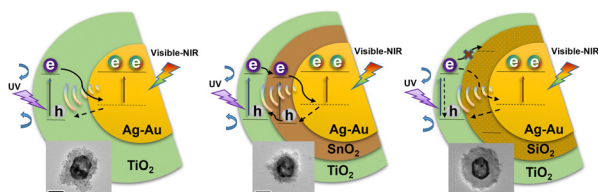
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### New findings on a Zintl phased K<sub>3</sub>Ag<sub>3</sub>As<sub>2</sub> ternary semiconductor compound for photovoltaic applications by first-principles methods

Magdalene Mutheu Kimuyu, Robinson Musembi,\* Julius Mwabora and Francis Nyongesa

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### TiO<sub>2</sub> core-shell and core-dual-shell nanoparticles with tunable heterojunctions and visible to near-infrared extinctions

Riddhiman Medhi, Sarawut Plengjaroensirichai, Nhat Ngo, Maria D. Marquez, Pannaree Srinoi, Hung-Vu Tran, Allan J. Jacobson, Tai-Chou Lee and T. Randall Lee\*

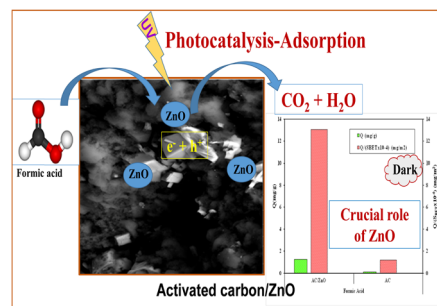




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### Synergy between activated carbon and ZnO: a powerful combination for selective adsorption and photocatalytic degradation

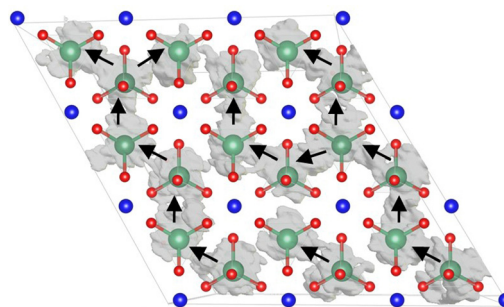
Wided Salah, Wahid Djeridi, Ammar Houas and Leila Elsellami\*



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### Oxide ion dynamics in hexagonal perovskite mixed conductor $Ba_7Nb_4MoO_{20}$ : a comprehensive *ab initio* molecular dynamics study

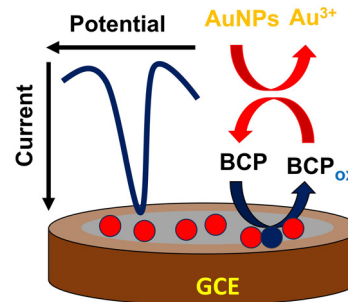
Bettina Schwaighofer, Markus Appel, Miguel Angel Gonzalez\* and Ivana Radosavljevic Evans\*



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### Red gum-capped gold nanoparticles for electrochemical sensing of bromocresol purple in water

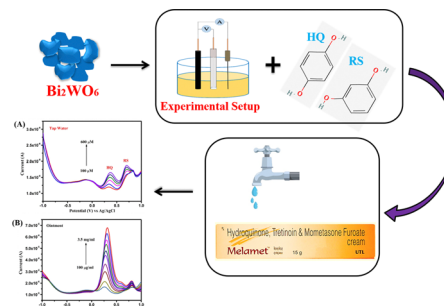
Moustafa Zahran,\* Magdi Abdel Azzem and Mona El-Attar



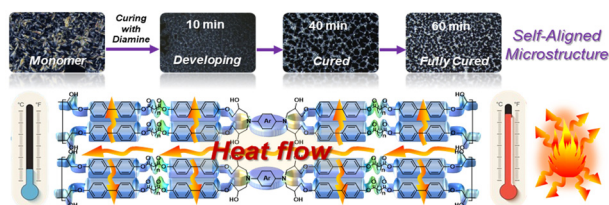
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### Bismuth tungstate nanocomposites for simultaneous detection of hydroquinone and resorcinol

Thatchanamoorthy Thenrajan, Madasamy Madhu malar, Sangeetha Kumaravel, Rajendran Rajaram, Subrata Kundu\* and Jeyaraj Wilson\*



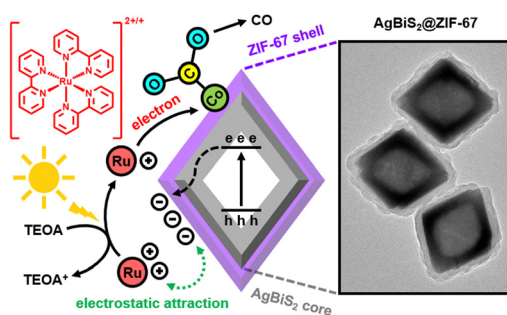
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### Enhancement of thermal conducting properties in epoxy thermoset systems using an aligned liquid-crystalline mesophase

Thi En Trinh and Hyeonuk Yeo\*

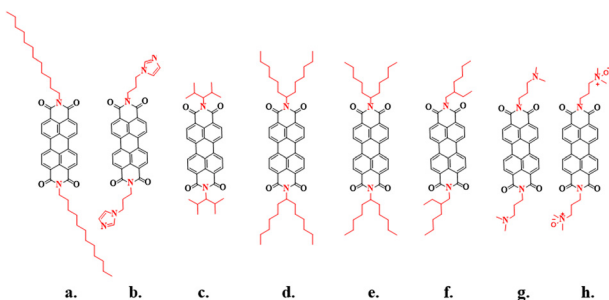
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### Enhanced light driven CO<sub>2</sub> conversion based on silver bismuth sulfide hollow octahedrons coated with amorphous metal-organic frameworks

Meng-De Dai, Qian Zhang, Hao Dong and Ya-Wen Zhang\*

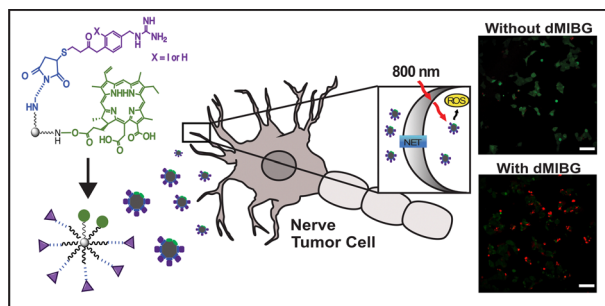
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### Synthesis and characterization of O-PDI for futuristic optoelectronic and rectifier applications

Akash and J. P. Tiwari\*

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### Efficient and highly biocompatible 8-arm PEG-Chlorin e6 nanosystems for 2-photon photodynamic therapy of adrenergic disorders

Natalie S. Potter, Zhen Wang, Evan C. Bornowski, Scott D. Swanson, John P. Wolfe, Alan McLean\* and Raoul Kopelman



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## Hole doping at Sn sublattice of the buckled honeycomb SnX (X = S and Se) monolayer: an efficient functionalization approach

D. M. Hoat\* and J. Guerrero-Sanchez

