

# Materials Advances

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## IN THIS ISSUE

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### Cover

Image credit © Yuichiro Chino/Getty Images

## EDITORIAL

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### Introduction to advancements in synthesis of high-performance materials from Nature's building blocks

Eleftheria Roumeli and Samantha L. Kristufek\*

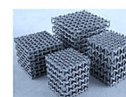
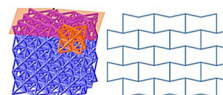


## REVIEWS

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### A review on mechanical metamaterials and additive manufacturing techniques for biomedical applications

Suhas P., Jaimon Dennis Quadros, Yakub Iqbal Mogul, Ma Mohin, Abdul Aabid,\* Muneer Baig and Omar Shabbir Ahmed



# RSC Applied Polymers

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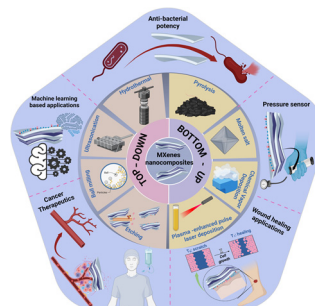
Fundamental questions  
Elemental answers

## REVIEWS

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### Translational paradigm of MXene nanocomposites: biophysical advancements to modern applications

Sriparna De, Shaikh Sheeran Naser, Aditya Nandi, Arpita Adhikari, Arbind Prasad, Kunal Sarkar, Adrija Sinha, Sushil Kumar Verma, Ateet Dutt, Dipankar Chattopadhyay, Nagendra Kumar Kaushik,\* Aishee Ghosh\* and Suresh K. Verma\*

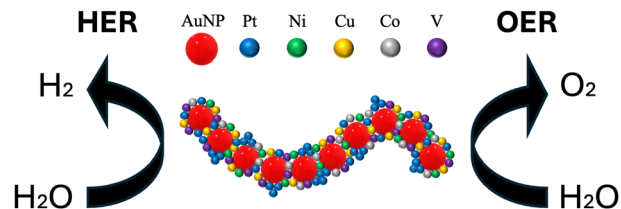


## COMMUNICATIONS

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### Facile tailoring of a multi-element nanocomposite for electrocatalysis

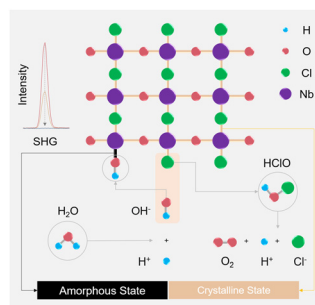
Mohamed Okasha and Vivek Maheshwari\*



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### Layered NbOCl<sub>2</sub> kinetic degradation mechanism and improved second-order nonlinear optical responses

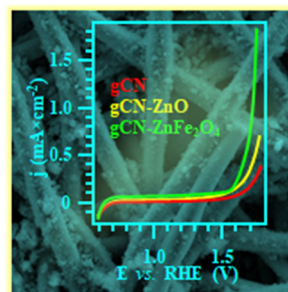
Jianlong Kang, Yiduo Wang, Li Zhou, Ahmed Asad, Defeng Xu, Zhihui Chen, Yingwei Wang,\* Jun He and Si Xiao\*



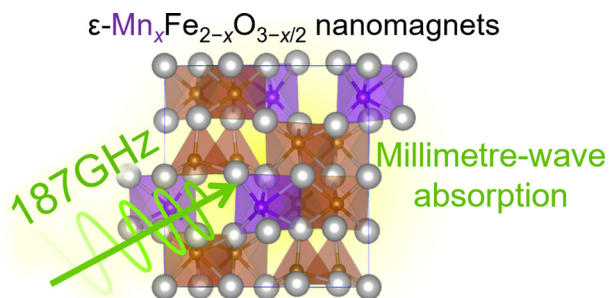
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### Nano- and ultra-dispersed ZnO and ZnFe<sub>2</sub>O<sub>4</sub> on graphitic carbon nitride as photoelectrocatalysts for the ethanol oxidation reaction

Tommaso Sturaro, Mattia Benedet, Mattia Brugia, Giacomo Marchiori, Gian Andrea Rizzi, Alberto Gasparotto, Davide Barreca,\* Oleg I. Lebedev and Chiara Maccato



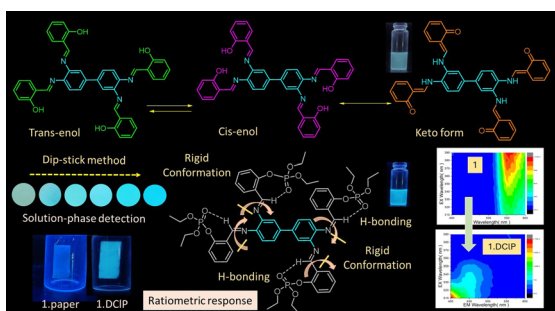
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### Mn-substitution effects on the magnetic and zero-field ferromagnetic resonance properties of $\epsilon\text{-Fe}_2\text{O}_3$ nanoparticles

Jessica MacDougall, Asuka Namai,\* Onno Strolka and Shin-ichi Ohkoshi\*

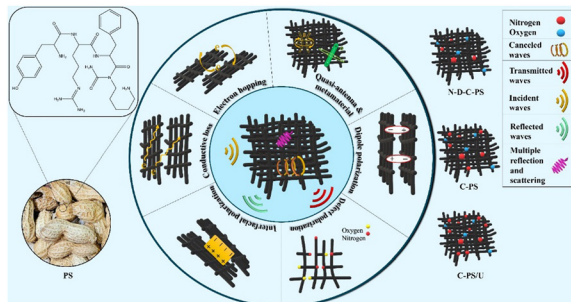
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### Comparative analysis of monomeric vs. dimeric salen fluorescent probes: transition from a turn-on to ratiometric response towards nerve gas agents in organic to aqueous media

Sourav Mondal and Nilanjan Dey\*

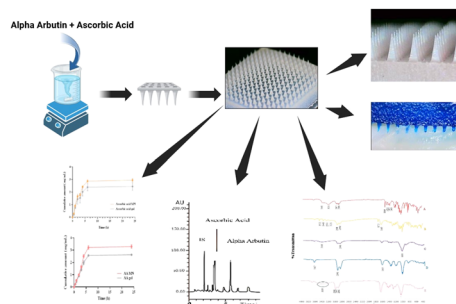
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### Evaluating nitrogen-doping and elimination effect in peanut shell-derived composites for improving microwave absorption using PMMA as a matrix

Haniyeh Dogari, Niloofar Salimi-Turkamani, Hossein Ghafari\* and Reza Peymanfar\*

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### Innovative dissolving microneedles for enhanced delivery of alpha arbutin and ascorbic acid: a novel LC-MS quantification approach

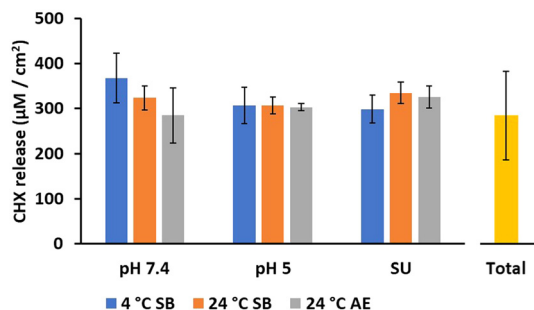
Ola Tarawneh,\* Sara Almasri, Ala A. Alhusban, Mohammad Hailat, Lama Hamadneh, Juhaina M. Abu Ershaid, Zeyad Hailat and Yahia F. Makableh



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### A novel multilayer antimicrobial urinary catheter material with antimicrobial properties

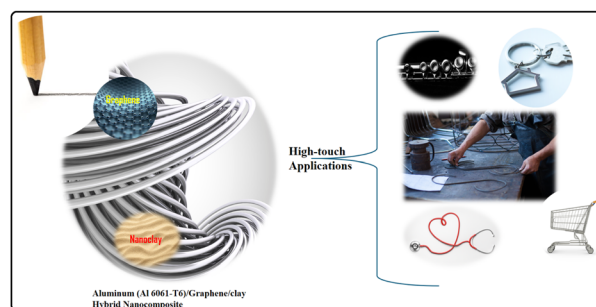
Benjamin Gambrell, Fabrizio Pertusati, Iqbal Shergill, Stephen Hughes and Polina Prokopovich\*



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### Investigation of the mechanical properties of an aluminum (Al 6061-T6)/graphene/bentonite hybrid nanocomposite experimentally and through finite element analysis study

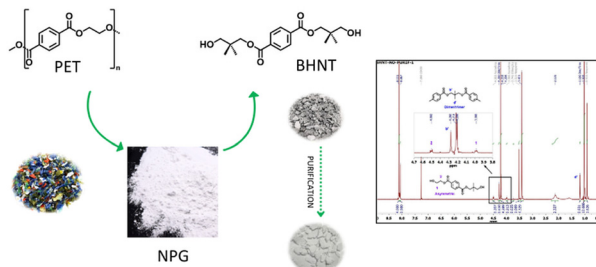
Hasan Bawa'neh, Bashar Lababneh, Ahmad M. Malkawi and Ayat Bozeya\*



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### Neopentyl glycol as an alternative solvent for the chemical recycling of complex PET waste

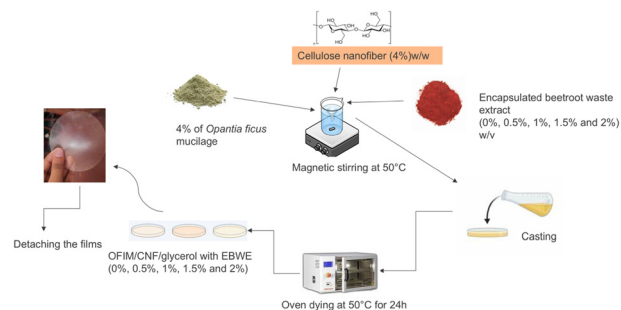
Izotz Amundarain,\* Sheila López-Montenegro, Asier Asueta, Sixto Arnaiz and Beñat Pereda-Ayo



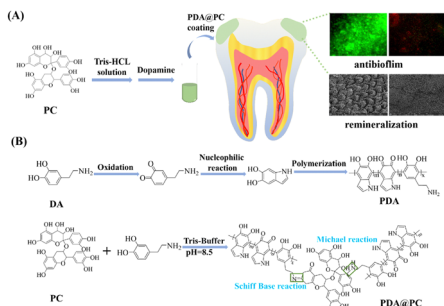
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### Fabrication of active and intelligent bio-based edible films using encapsulated beetroot powders for smart packaging

Mkhari Tshamisane, Jerry O. Adeyemi and Olaniyi A. Fawole\*



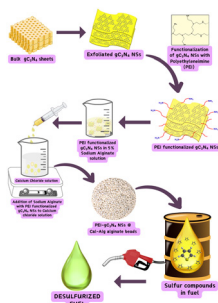
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### Mussel-inspired novel coating with cariogenic biofilm inhibition and *in situ* remineralization properties for caries treatment

Jiaolong Wang, Min Ge, Huizhen Wang, Haiyan Yao, Yunyun Deng and Junchao Wei\*

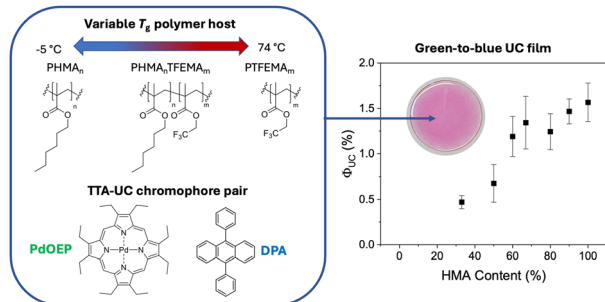
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### Poly(ethyleneimine)-exfoliated $g\text{-C}_3\text{N}_4$ nanosheets implanted in alginate beads and their application towards adsorptive desulfurization

M. Christina Nilavu, A. Santhana Krishna Kumar,\* Himanshu Aggarwal\* and N. Rajesh\*

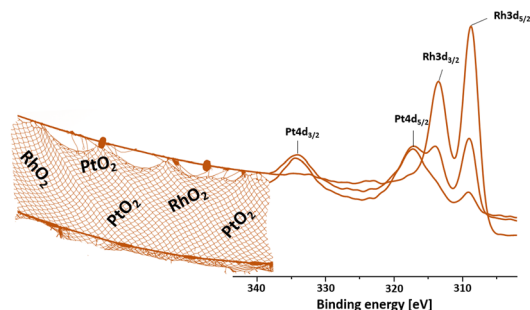
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### Methacrylate-based copolymers as tunable hosts for triplet-triplet annihilation upconversion

Michael J. Bennisson, Abigail R. Collins, Larissa Gomes Franca, Georgina H. Burgoyne Morris, Niamh Willis-Fox, Ronan Daly, Joshua K. G. Karlsson, Bethan L. Charles and Rachel C. Evans\*

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### Reactivity of gaseous PtO<sub>2</sub> and RhO<sub>2</sub> with LaNiO<sub>3</sub> thin films: a systematic XPS study

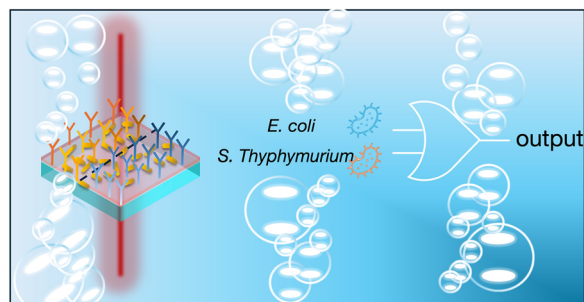
Julie Hessevik,\* Henrik H. Sønsteby, Helmer Fjellvåg and Anja O. Sjøstad\*



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### Logic-OR gate gold nanorod-based plasmonic biosensor for multipathogen detection and photothermal disinfection

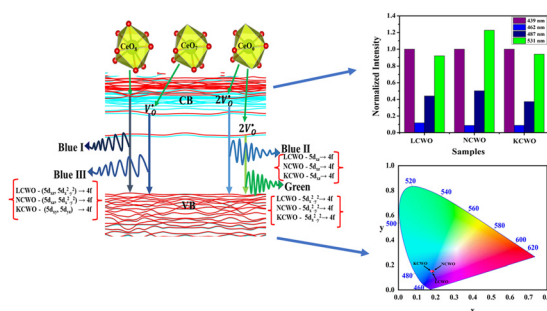
Francesca Petronella,\* Daniela De Biase, Carlo Santini, Arianna Avitabile, Maria Laura Sforza, Federica Zaccagnini, Antonio d'Alessandro and Luciano De Sio\*



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### Influence of alkali metal ions on the defect induced photoluminescence properties of double tungstate compounds $ACe(WO_4)_2$ ( $A = Li, Na, K$ ): experimental and *ab initio* theoretical study

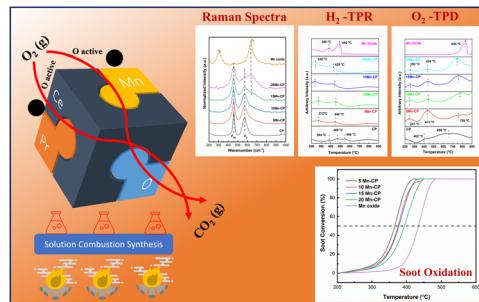
Nibedita Haldar\* and Tanmoy Mondal



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### Diesel soot oxidation over Mn–Pr–Ce oxide catalysts: structural changes and the impact of Mn doping

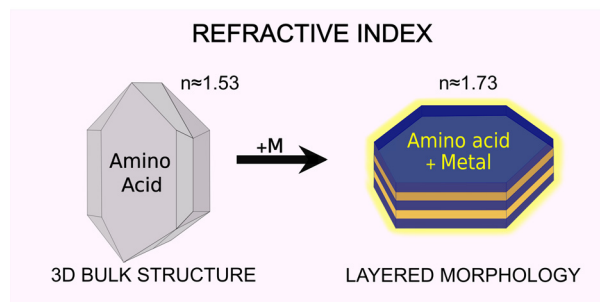
Sunaina S. Patil, Hari Prasad Dasari,\* Rahul Kumar Shirasangi and Harshini Dasari\*



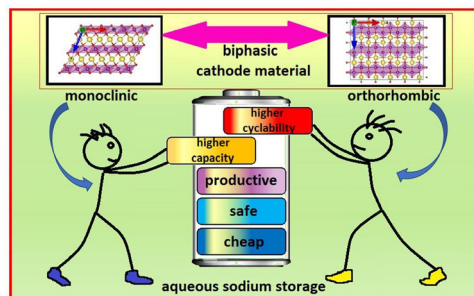
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### Role of metal atoms in the refractivity of cysteine- and phenylalanine-based metal–organic crystals

Noam Brown, María Camarasa-Gómez, Angelica Niazov-Elkan, Ashwin Ramasubramaniam, Ehud Gazit,\* Leeor Kronik\* and Oded Hod\*



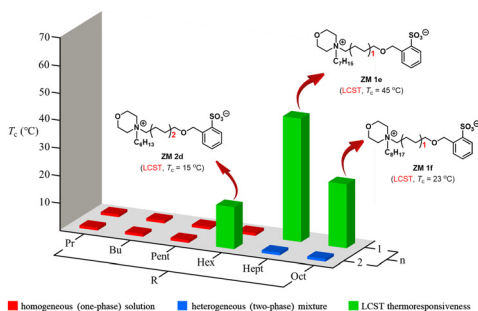
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## High-performance biphasic $\text{Na}_x\text{MnO}_2$ electrodes for cost-effective and high-power aqueous sodium batteries and capacitors

Andrii Boichuk,\* Tetiana Boichuk, Mahesh Eledath-Changarath, Marie Krečmarová, Rafael Abargues, Pablo P. Boix, María C. Asensio, Saïd Agouram and Juan F. Sánchez-Royo\*

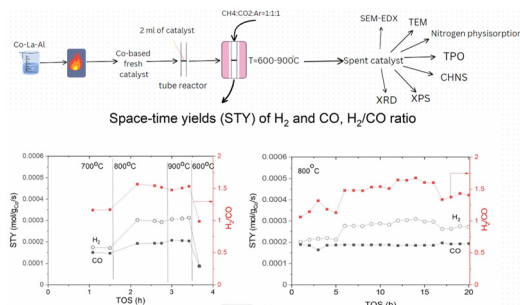
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## Small-molecule zwitterionic morpholinium sulfonates as non-cytotoxic materials exhibiting LCST thermo-responsive phase separation in water

Yu-Hsin Chung, Jianbo Jia, Wen-Yi Chen, Pin-Hsuan Chen, Bing Yan\* and Yen-Ho Chu\*

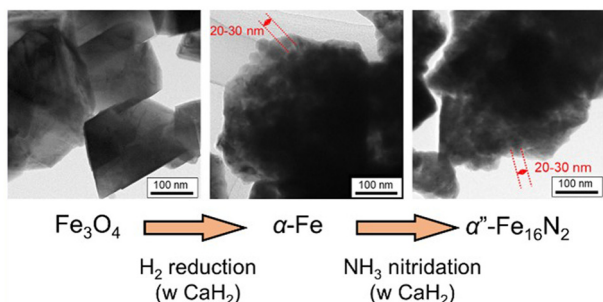
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## Dry methane reforming over lanthanide-doped Co–Al catalysts prepared via a solution combustion method

Dinmukhamed Shoganbek, Mark Martinez-Klimov, Olha Yevdokimova, Anssi Peuronen, Mika Lastusaari, Atte Aho, Svetlana A. Tungatarova, Tolkyn S. Baizhumanova, Daulet A. Zhumadullaev, Manap Khan Zhumabek, Yermek A. Aubakirov, Alua Manabayeva, Päivi Mäki-Arvela and Dmitry Yu. Murzin\*

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## Synthetic route for high-yield $\alpha'$ - $\text{Fe}_{16}\text{N}_2$ submicron-sized powder using $\text{CaH}_2$ drying agent

Takayuki Tsuchida,\* Jun Fukushima, Masahiro Tobise and Hirotsugu Takizawa



## CORRECTION

1198

**Correction: 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\*

## RETRACTION

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**Retraction: Influence of carbon additions on microstructures and mechanical properties in additive manufactured superalloys**

Mingjun Xie, Yan Zhao,\* Jianjun Guan, Yanhong Yang\* and Yuting Fu

