

# Materials Advances

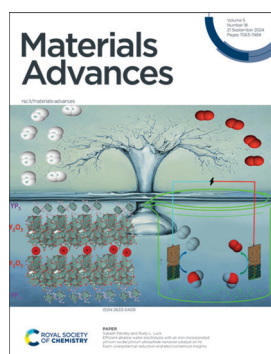
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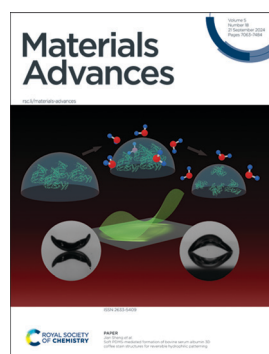
## IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 5(18) 7063-7484 (2024)



### Cover

See Subash Pandey and Rudy L. Luck, pp. 7147–7158. Image reproduced by permission of Rudy L. Luck from *Mater. Adv.*, 2024, 5, 7147. The background image was generated using AI at [Gemini.google.com/app](https://gemini.google.com/app)



### Inside cover

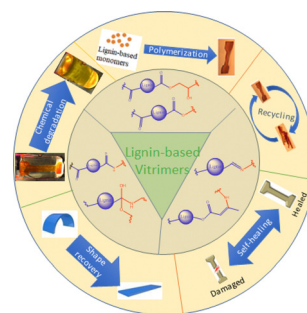
See Jian Sheng *et al.*, pp. 7159–7169. Image reproduced by permission of Kosuen Cheng, Kimberly Lopez, Maryam Jalali-Mousavi and Jian Sheng from *Mater. Adv.*, 2024, 5, 7159.

## REVIEWS

7075

### Lignin-based vitrimers: valorization and utilization of lignin in high-value applications

Peter K. Karoki, Shuyang Zhang, Yunqiao Pu and Arthur J. Ragauskas\*

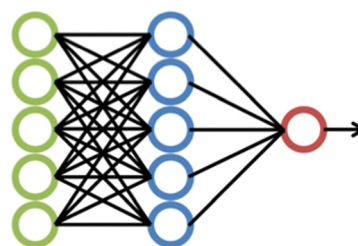


7097

### Machine learning for carbon dot synthesis and applications

Ali Nabi Duman\* and Almaz S. Jalilov\*

#### MACHINE LEARNING



#### PLQY



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## REVIEWS

7113

### Optical anti-counterfeiting with cholesteric liquid crystal emulsions: preparation, properties, and applications

Buchaiah Gollapelli,\* Supraja Potu,  
Rakeshkumar Rajaboina and  
Jayalakshmi Vallamkondu\*



7130

### The origin and evolution of molecular precursors for quantum dot synthesis

Mark Green

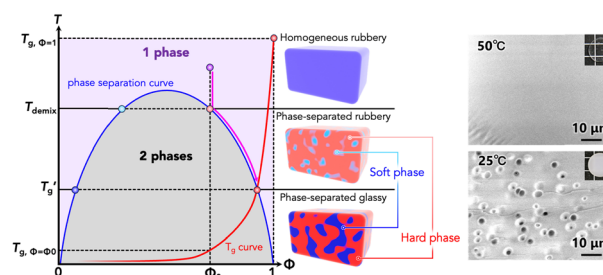


## COMMUNICATION

7140

### Phase separation-induced glass transition under critical miscible conditions

Mayu Watanabe, Dong Shi, Ryuji Kiyama,  
Kagari Maruyama, Yuichiro Nishizawa,  
Takayuki Uchihashi, Jian Ping Gong and  
Takayuki Nonoyama\*

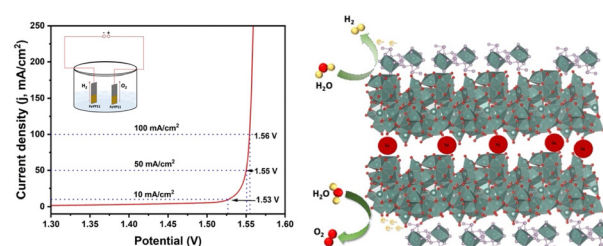


## PAPERS

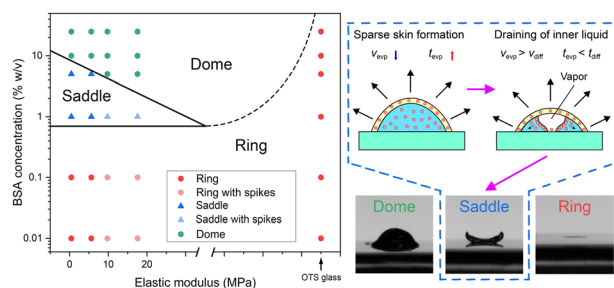
7147

### Efficient alkaline water electrolysis with an iron-incorporated yttrium oxide/yttrium phosphide nanorod catalyst on Ni foam: overpotential reduction and electrochemical insights

Subash Pandey and Rudy L. Luck\*



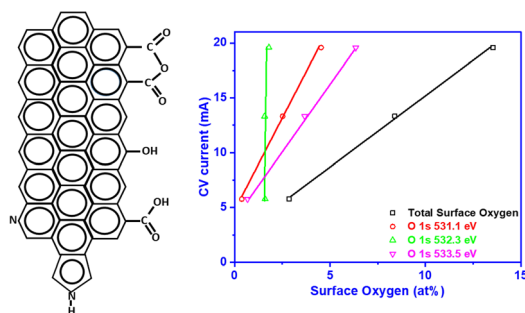
7159



### Soft PDMS-mediated formation of bovine serum albumin 3D coffee stain structures for reversible hydrophilic patterning

Samuel Kok Suen Cheng, Kimberly Lopez, Maryam Jalali-Mousavi and Jian Sheng\*

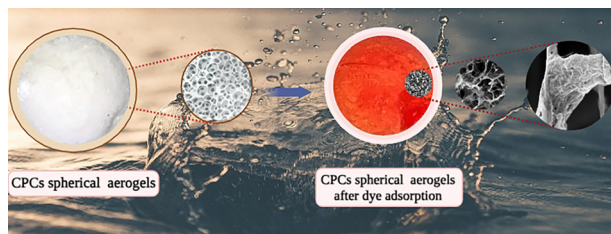
7170



### Spectroelectrochemical study of carbon structural and functionality characteristics on vanadium redox reactions for flow batteries

Ha H. Phan, Jon G. Bell, Greg A. Mutch, Alan J. McCue, Anh N. Phan\* and K. Mark Thomas\*

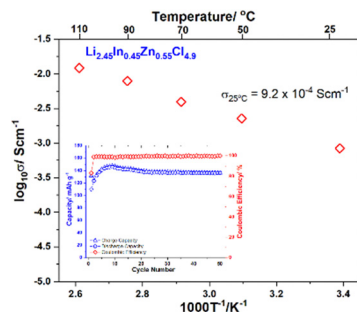
7199



### Functional porous protein nanofibrils/polysaccharides aerogel beads for efficient dyes removal from water

Mandana Dilamian, Majid Montazer, Hossein Yousefi, Daniel E. Otzen and Dina Morshedi\*

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### Preparation of $\text{Li}_{2+x}\text{In}_x\text{Zn}_{1-x}\text{Cl}_{4+2x}$ ( $0 \leq x \leq 0.5$ ) solid electrolyte and its application in all-solid-state Li-ion batteries

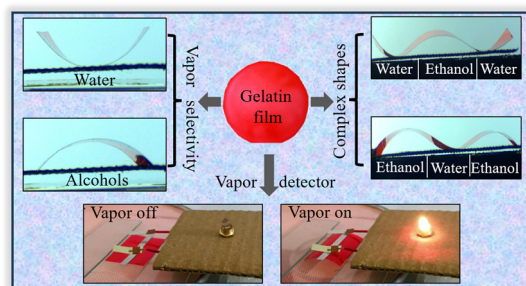
Nguyen Thi Minh Nguyet, Tran Viet Toan, Luu Tuan Anh, Luong Thi Quynh Anh, Tran Anh Tu and Nguyen Huu Huy Phuc\*



7230

## Vapor selective and controlled actuation of gelatin-based soft actuators

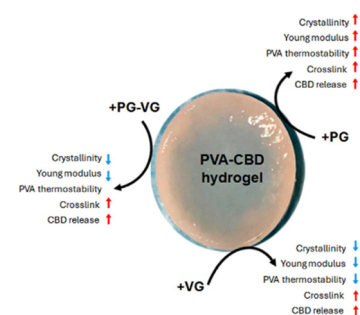
Vipin Kumar, Sarah Ahmad Siraj and Dillip K. Satapathy\*



7244

## Design, characterization, and release profile of a cannabidiol (CBD)-rich polyvinyl alcohol hydrogel

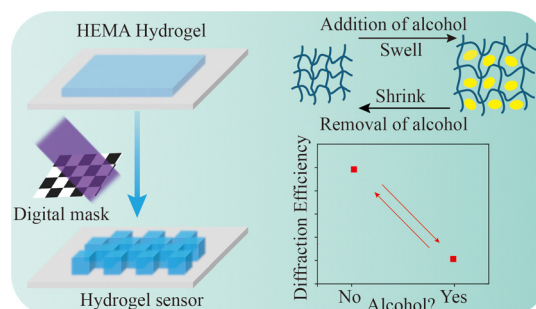
Shujun Cui, Maryam Bahraminia, Mahmoud Rouabhia,\* Abdelhabib Semlali, François Béland and Ze Zhang



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## DMD-based optical printing of PHEMA hydrogel gratings for sensitive and rapid alcohol sensing

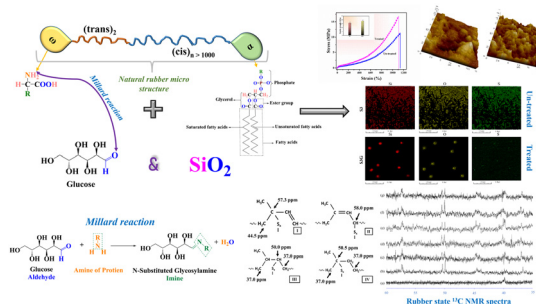
Jing Xu, Fanglei Guo, Carmen Bartic, Koen Clays and Yovan de Coene\*



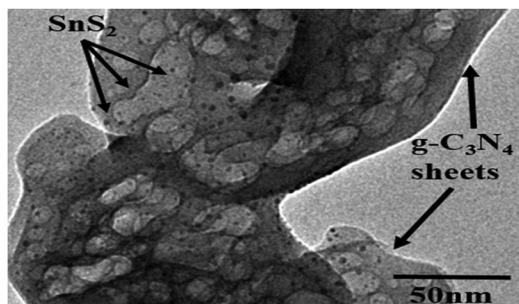
7264

## A step towards a green and sustainable method to understand the effect of glucose on a silica filled natural rubber composite

Abhijit Bera, Masaki Yamano, Seiichi Kawahara\* and Santanu Chattopadhyay\*



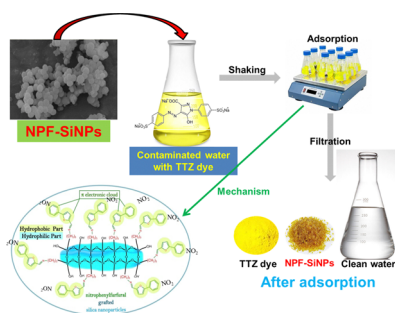
7278



### Pioneering the design of S-scheme SnS<sub>2</sub>/g-C<sub>3</sub>N<sub>4</sub> nanocomposites *via* sonochemical and physical mixing methods for solar degradation of cationic rhodamine B dye

Ali Alsalmeh, Mustafa Hesham, Ayman Soltan, Nagy N. Mohammed, A. Qassim Nejm, M. F. Abdel Messih, Islam A. Hussein and M. A. Ahmed\*

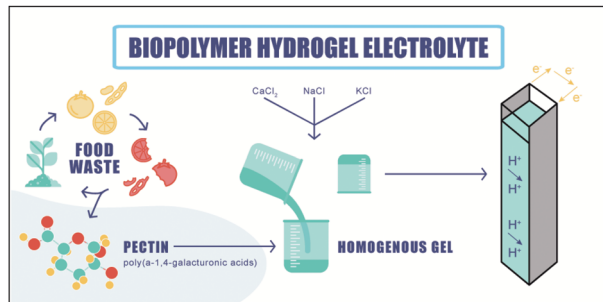
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### Nitrophenylfurfural grafted amino functionalized silica nanoparticles for adsorptive removal of tartrazine dye from water

Syed Salman Shafqat,\* Bushra Zafar, Syeda Amna Masood, Syed Rizwan Shafqat, Hafeez Ullah Khan, Asad Syed, Ali H. Bahkali, Sadaf Mutahir, Muhammad Asim Khan, Guobao Xu and Muhammad Nadeem Zafar\*

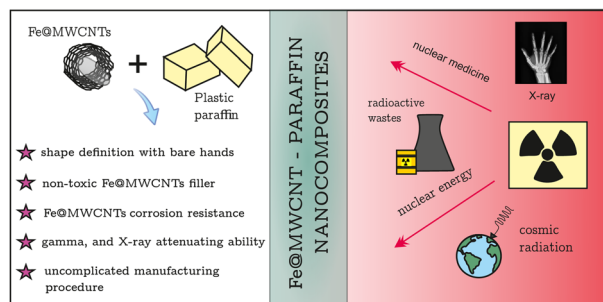
7312



### Novel biopolymer pectin-based hydrogel electrolytes for sustainable energy storage

Nathan W. Wilson and Gerardine G. Botte\*

7327



### Soft, ternary, X- and gamma-ray shielding materials: paraffin-based iron-encapsulated carbon nanotube nanocomposites

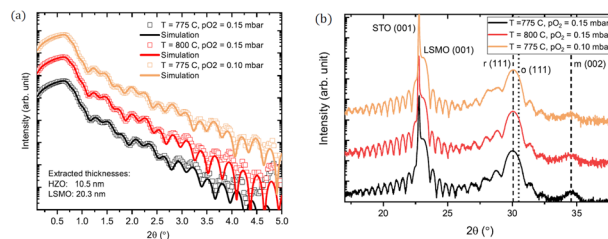
Jolanta Sobczak, Adrian Truskiewicz, Krzysztof Cwynar, Szymon Ruczka, Anna Kolanowska, Rafał G. Jędrzyak, Sylwia Waśkiewicz, Marzena Dzida, Sławomir Boncel\* and Gawet Żyła\*



7342

## Synthesis of rhombohedral $\text{Hf}_{0.5}\text{Zr}_{0.5}\text{O}_2$ and analysis by X-ray diffraction through dynamical diffraction simulations

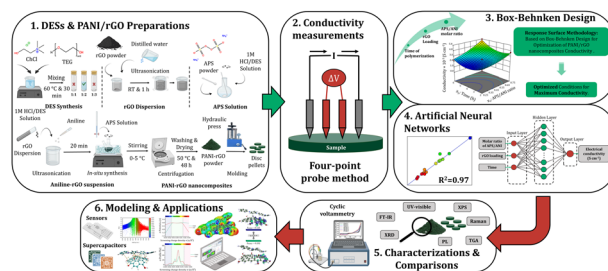
Kit de Hond, Guus Rijnders and Gertjan Koster\*



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## Comprehensive investigation of multifunctional polyaniline/reduced graphene oxide nanocomposites synthesized from deep eutectic solvents: experimental, RSM, ANN and computational studies

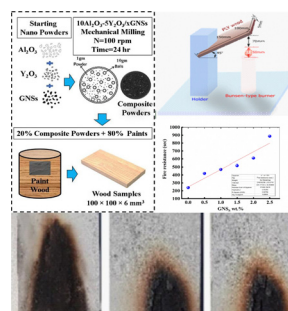
Abir Boublia, Zahir Guezout, Nacerddine Haddaoui, Michael Badawi, Imane Lakikza, Ilyas Belkhettab, Ouahiba Moumeni, Saoussen Imene Aouni, Manawwer Alam and Yacine Benguerba\*



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## Low cost paints reinforced with an $\text{Al}_2\text{O}_3/\text{Y}_2\text{O}_3/\text{graphene}$ nanocomposite for fire-resistant wood coating applications

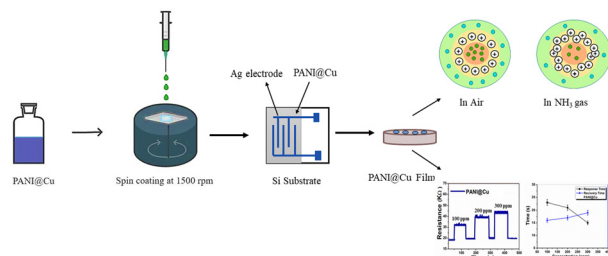
Ahmed El-Tantawy, Ibrahim M. Hassan, Omayma A. El-kady, Ahmed. I. Ali,\* Jong Yeog Son\* and Nasser. M. Ayoub



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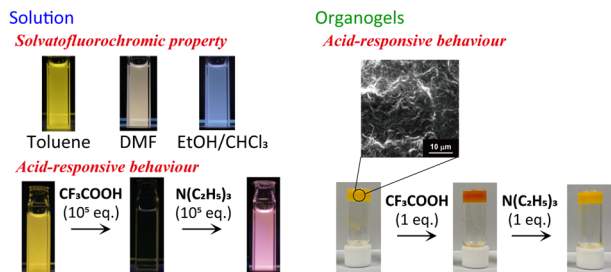
## Gas sensing properties of a Cu-doped PANI nanocomposite towards ammonia

Arunima Verma and Tanuj Kumar\*



7401

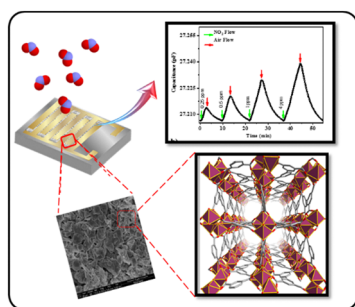
## Hydrogen-bonding fluorenone-based donor–acceptor–donor triads



## Multi-stimuli-responsive behaviours of fluorenone-based donor–acceptor–donor triads in solution and supramolecular gel states

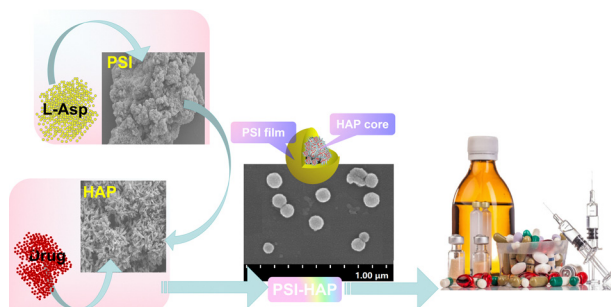
Mao Suzuki, Atsushi Seki,\* Syota Yamada and Ken'ichi Aoki

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The deployment of an NOTT-300 (Al) MOF thin film as a NO<sub>2</sub> capacitive sensor under ambient conditions

Mohamed Rachid Tchalala, Osama Shekhah, Youssef Belmabkhout, Hao Jiang, Khaled N. Salama\* and Mohamed Eddaoudi\*

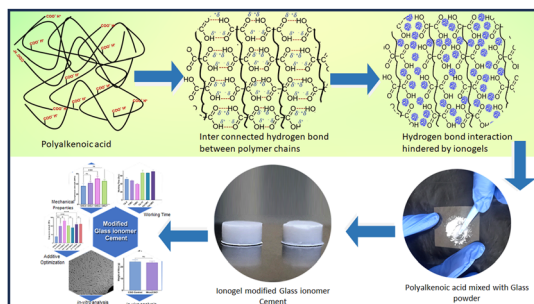
7419



## Studies of a novel nano sustained-released drug delivery system with a hydroxyapatite core and polysuccinimide coating structure

Fengbo Yu, Qiang Wang, Dan Liu, Xingjun Fan, Lei Tong, Guangzhi Shen and Fengguo Zhai\*

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## Ionogel impregnated glass ionomer cement and the effect of nanoparticle additives

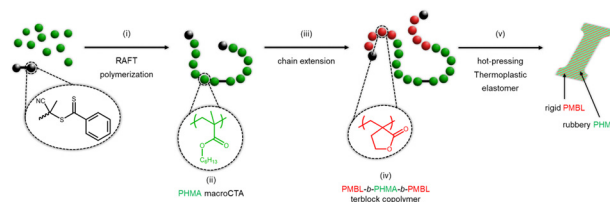
Sreejith Sasidharan Lathikumari and Manju Saraswathy\*



7446

### Synthesis of a thermoplastic elastomer from $\alpha$ -methylene- $\gamma$ -butyrolactone for high temperature applications

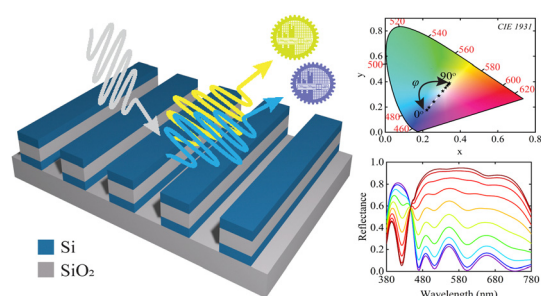
Friso G. Versteeg, Théophile Pelras, Giuseppe Portale and Francesco Picchioni\*



7455

### A polarization tunable incident angle tolerant dielectric metasurface-based color filter

Soikot Sarkar, Dip Sarker and Ahmed Zubair\*

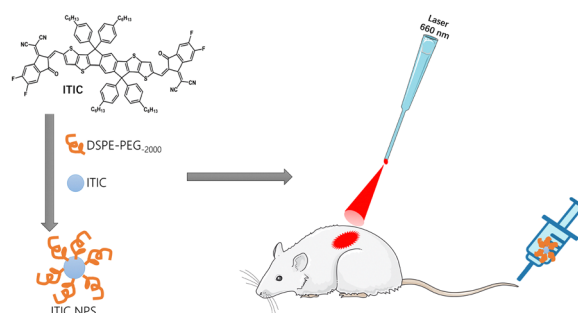


An ingenious Si-SiO<sub>2</sub>-Si grating dielectric metasurface structure was engineered to obtain structural colorization.

7467

### Synthesis of a new photosensitizer for laser-mediated photodynamic therapy to kill cancer cells in gliomas

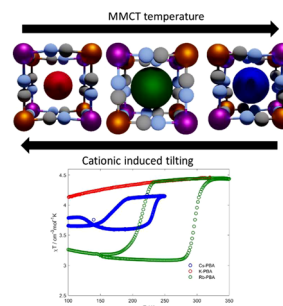
Guangshu Liang, Yining Yang, Daofu Cheng, Yuyan Ma and Linping Yan\*



7473

### Controlling A<sub>x</sub>Mn[Fe(CN)<sub>6</sub>] charge transfer pathways through tilt-engineering for enhanced metal-to-metal interactions

A. Regueiro, J. Castells-Gil, C. Shen, I. Mikulska, C. Allen, L. Bogani\* and R. Torres-Cavanillas\*



## CORRECTION

7481

**Correction: Imidazolium-based ionic liquids support biosimilar flavin electron transfer**

Grace I. Anderson, Alec Agee and Ariel L. Furst\*

