

# Materials Advances

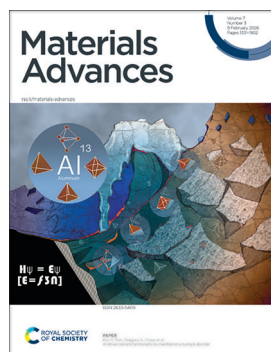
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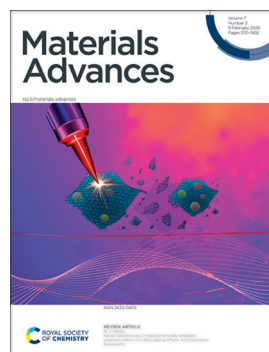
## IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 7(3) 1331-1902 (2026)



### Cover

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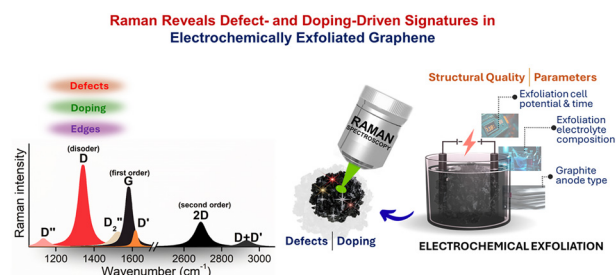
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## REVIEWS

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### Raman spectroscopy of electrochemically exfoliated graphene: defect evolution, doping effects, and interpretive frameworks

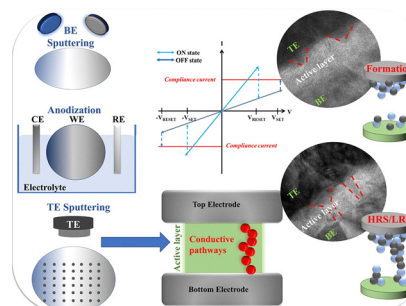
M. J. Madito



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### A brief overview of anodic memristors: fundamentals, classification and properties

Elena Atanasova, Andreas Greul, Achim Walter Hassel,  
Andrea Zaffora, Monica Santamaria and  
Andrei Ionut Mardare\*



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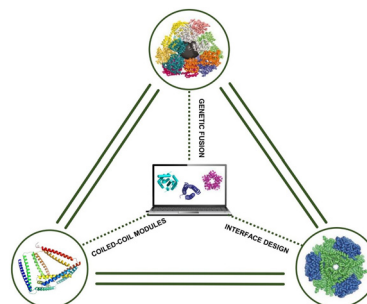


## REVIEWS

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### Self-assembling protein cages: from coiled-coil module to machine learning-driven *de novo* design of next-generation biomaterials

Arvind Kumar Gupta, Hana Esih, Helena Gradišar and Roman Jerala\*

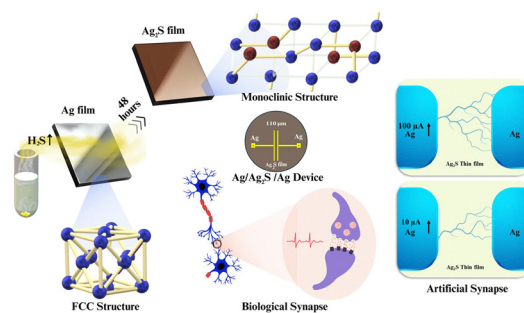


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### Controlled sulfidation of silver: a pathway to Ag<sub>2</sub>S for short-term synaptic emulation

Shreepooja Bhat, Namitha Bannur, Nanditha Thayyath Kizhakkeveetil, Rajashekhar Pujar and Gurusurthy Sangam Chandrasekhar\*

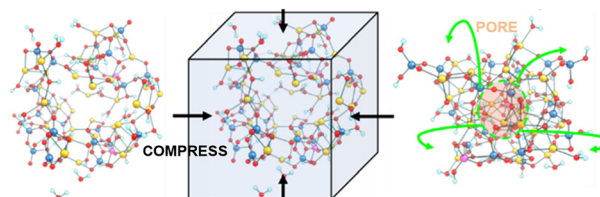


## PAPERS

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### AI-driven cement functionality by manifold structuring & disorder

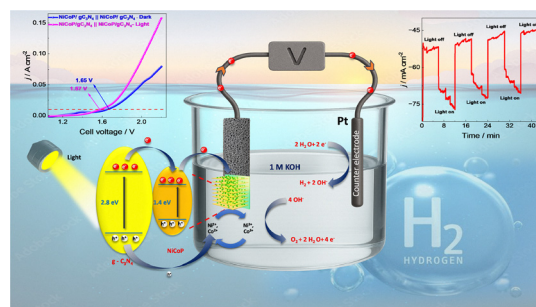
Mohammed S. Salha, Henry Adenusi, David H. Setiadi, Rickey Y. Yada, David H. Farrar, Devis Di Tommaso, Kun V. Tian\* and Gregory A. Chass\*



1417

### Photo-assisted water splitting over a NiCoP/g-C<sub>3</sub>N<sub>4</sub> heterostructure: understanding the role of visible light in electrochemical water splitting

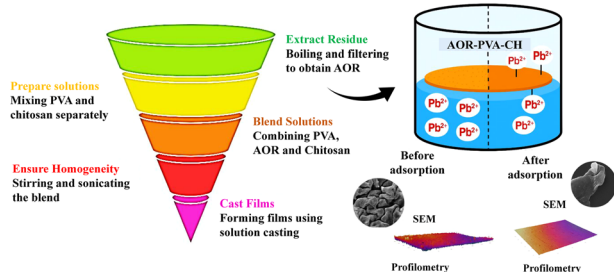
Mahesha P. Nayak, John D. Rodney, Sushmitha S and Badekai Ramachandra Bhat\*



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## Creating Sustainable Adsorbent Films

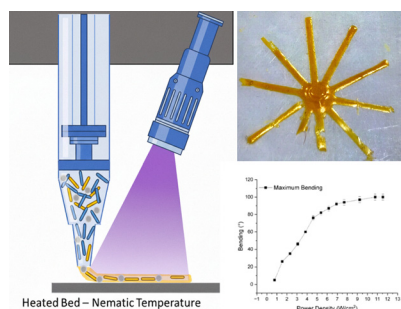
## Adsorption Process of Lead Ions



## Sustainable fabrication of arecanut waste-based polymer blend adsorbents for enhanced lead(II) ion removal from water

Jasmine Jose, Binish CJ, Jobish Johns, Aniz CU, Sony J. Chundattu and Vijayasankar AV\*

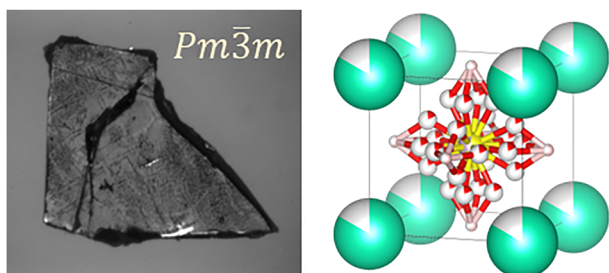
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## 4D printing of unaligned LCE: a facile approach to print photo mobile polymers

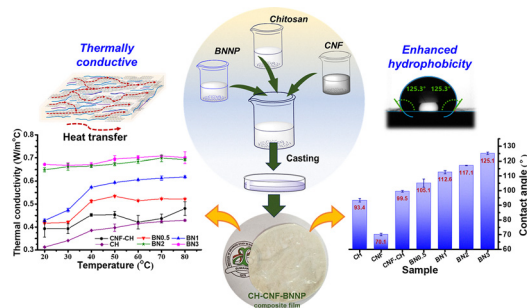
Domenico Sagnelli,\* Amalia D'Avino, Bryan Guilcapi, Tommaso Fasolino, Anna De Girolamo Del Mauro, Fausta Loffredo, Fulvia Villani, Giuseppe Nenna\* and Lucia Petti\*

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X-ray and neutron diffraction studies of single-crystal cubic  $\text{Cs}_2(\text{HSO}_4)(\text{H}_2\text{PO}_4)$ 

Grace Xiong and Sossina M. Haile\*

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## Enhanced performance of biobased composite films: the role of boron nitride nanoplatelets in tuning their hydrophobic, chemical resistance, thermal and electrical properties

Bitupan Mohan, Rahul Sonkar, Mridusmita Barman and Devasish Chowdhury\*



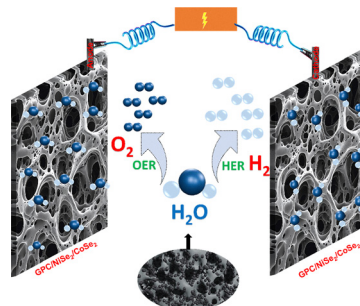


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### *In situ* synthesis of bimetallic selenides on green porous carbon: density functional theory-proven electrocatalysts for efficient water splitting

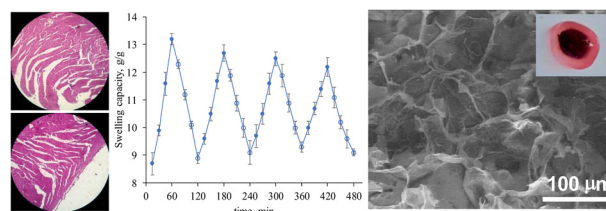
Anjana Sajeevan, Nijash Neermunda, Sampath Karingula, Pooja, Soumyajit Jana, Ravindar Pawar and Yugender Goud Kotagiri\*



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### Fabrication of a superabsorbent and pH-responsive glucomannan-based hydrogel: crosslinking, characterization, toxicological evaluation, and sustained-release of itopride

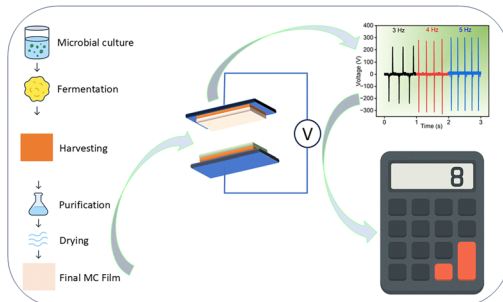
Fasiha Amjad, Arshad Ali, Muhammad Ajaz Hussain,\* Muhammad Tahir Haseeb, Muhammad Farid-ul-Haq, Izza Ajaz, Muhammad Sher and Muhammad Imran



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### An edible microbial cellulose-based triboelectric nanogenerator: a sustainable approach for energy harvesting

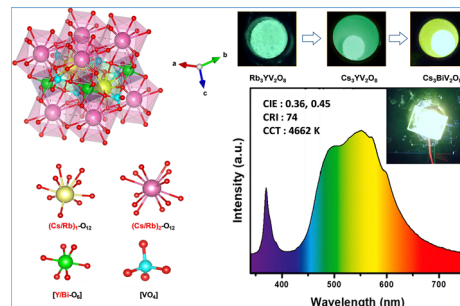
Raj Ankit, Simranjeet Kaur, Shinar Athwal, Taranveer Kaur and Jayant Kolte\*



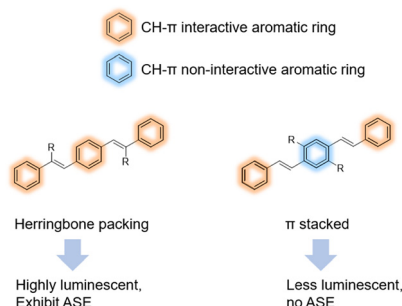
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### Single-host white light emission in self-activated $\text{Rb}_{3-x}\text{Cs}_x\text{Y}_{1-y}\text{Bi}_y\text{V}_2\text{O}_8$ : crystal engineering for high-performance indoor lighting

J. S. Revathy, Monalisha Behera, Shisina S, Jatin Dhanuka, Sudipta Som,\* R. K. Dubey and Subrata Das\*



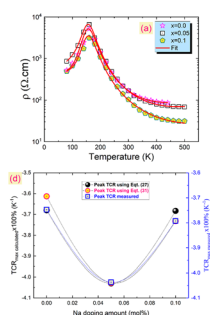
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## Crystal engineering focusing on intermolecular CH- $\pi$ interactions in the 1,4-distyrylbenzene backbone for organic crystal laser media

Takumi Matsuo,\* Daisuke Furusho, Shinsuke Inagi and Shotaro Hayashi\*

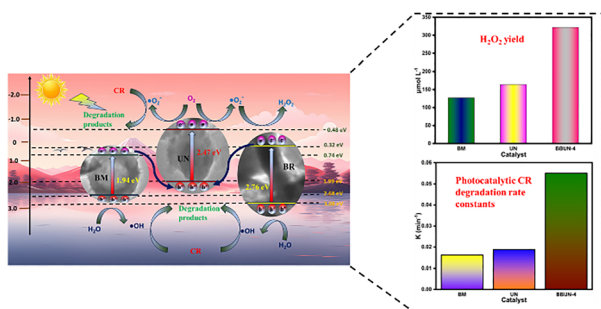
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## TCR parameter study for examining the possibility of the usefulness of perovskite $\text{Pr}_{0.8}\text{K}_{0.2-x}\text{Na}_x\text{MnO}_3$ ( $x = 0.0, 0.05$ and $0.1$ ) systems for thermistor and bolometer applications

Issam Ouni\* and Hedi Rahmouni

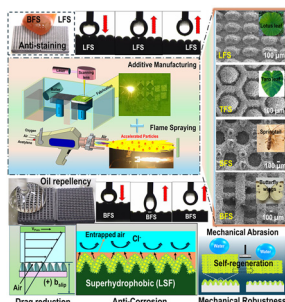
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## Amplified photocatalytic performance of UiO-66- $\text{NH}_2$ /BiOI@ $\alpha$ - $\text{Bi}_2\text{O}_3$ ternary heterojunctions towards Congo red degradation and $\text{H}_2\text{O}_2$ production

Anubhav Naik, Kundan Kumar Das, Prakash Chandra Sahoo and Rashmi Acharya\*

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## Bioinspired superhydrophobic surfaces for anti-corrosion and drag reduction using additive manufacturing for marine applications

Aishwarika Raj Sharma, Harpreet Arora and Harpreet Singh Grewal\*

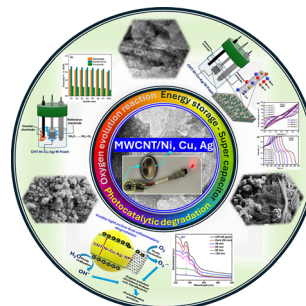


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### Synergistic effects of metal-modified carbon nanotubes: experimental characterization and theoretical modeling for energy and environmental solutions

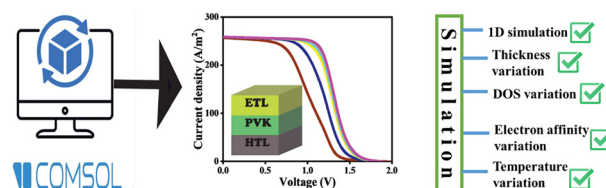
Govindhasamy Murugadoss,\* Nachimuthu Venkatesh, Narthana Kandhasamy, Irina Zaporotskova, Durai Govindarajan, Natesan Kumaresan, Kamalan Kirubakaran, Uday Kumar Khanapuram\* and Soorathep Kheawhom\*



1604

### Optimization of lead-free BiFeO<sub>3</sub> perovskite solar cells for efficient solar-energy conversion in futuristic green technologies

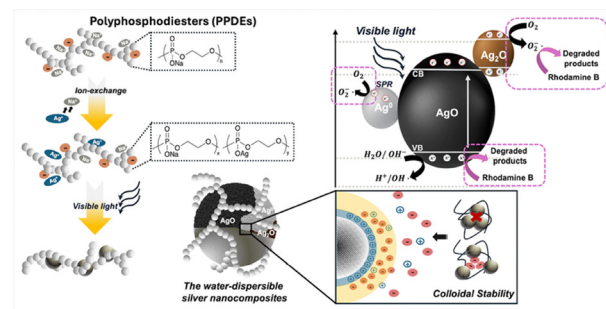
Muhammad Umar Salman\* and Shahid Atiq\*



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### Visible light-driven photocatalytic properties of polyphosphodiester-protected silver nanocomposites

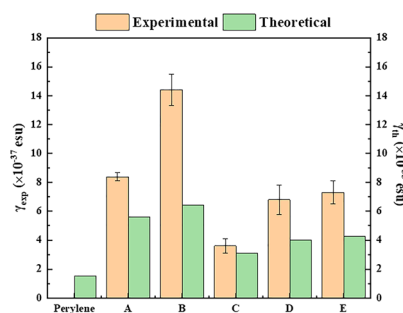
Thanaporn Jullabuth, Yota Okuno, Hideya Kawasaki, Satoshi Ichikawa and Yasuhiko Iwasaki\*



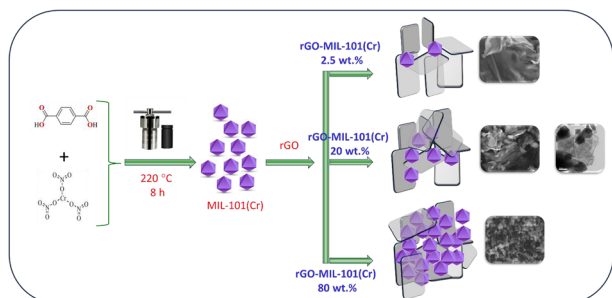
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### Functionalization tuning of the nonlinear optical response of perylene diimide derivatives

George Skentzos, Efrosyni Pramatioti, Nathalie Zink-Lorre, Ana María Gutiérrez-Vilchez, Eleni Nikoli, Ruben Canton-Vitoria, Aggelos Avramopoulos,\* Nikos Tagmatarchis,\* Fernando Fernández-Lázaro\* and Stelios Couris\*



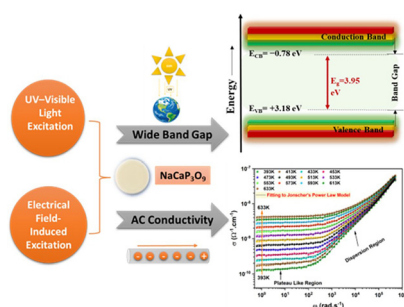
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### Synergistic potential of MIL-101(Cr) and reduced graphene oxide (rGO) in designing high-performance ammonia sensors

Shrinivas C. Motekar, Govind G. Umarji, Amol G. Kadlag, Bharat B. Kale and Sudhir S. Arbuj\*

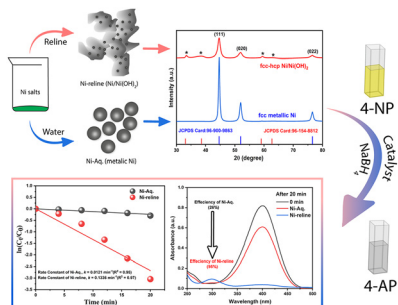
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### Enhanced optical, electrical and charge transport properties of $\text{NaCaP}_3\text{O}_9$ ceramics for emerging advanced technologies

Mayssa Karray, Iheb Garoui, Saber Nasri, Nourah A. Alsobai, Noweir Ahmad Alghamdi and Abderrazek Oueslati\*

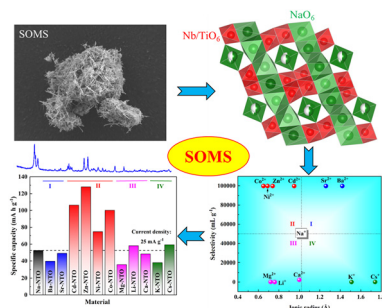
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### Reline-assisted synthesis of fcc-hcp $\text{Ni/Ni(OH)}_2$ nanocatalyst for effective reductive hydrogenation of 4-nitrophenol

Md. Minhajul Alam Khan, Shawon Saha, Sumaya Nur Mithila, Yeasin Arafat Tarek, Akter Hossain Reaz and Shakhawat H. Firoz\*

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### Niobium-oxide-based octahedral molecular sieves as novel anode materials for sodium-ion batteries

Y. Bhaskara Rao, Naser Tavajohi\* and C. André Ohlin\*

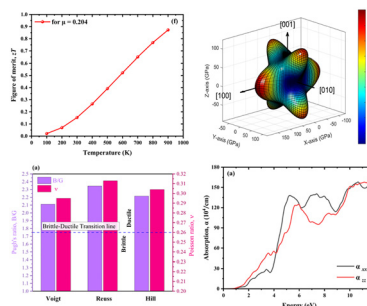




1704

## First-principles investigation of CuBiSeCl<sub>2</sub>: a quaternary halide chalcogenide material for advanced optoelectronic and thermoelectric energy harvesting and conversion technologies

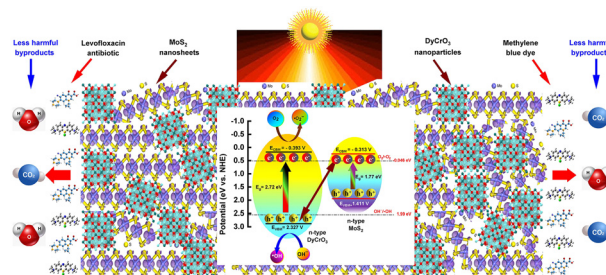
Zihad Hossain, Md. Riad Khan, Sanzida Naznin Mim, Md. Emon Hassan, Mohammad Abdur Rashid and Md. Lokman Ali\*



1721

## Enhanced photocatalytic degradation of pollutants via MoS<sub>2</sub>-integrated DyCrO<sub>3</sub> nanostructures

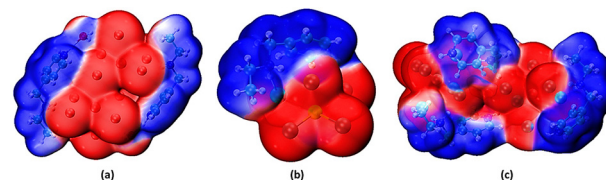
Md. Mahbubar Rahman, Md. Sobuj Hossain, Tasnim Jahan and M. A. Basith\*



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## Comprehensive structure–property–function correlation in three hybrid Bi(III) and Sb(III) metal halide compounds based on 4-ethylaminomethylpyridine: comparative insights into optical, dielectric, and antibiological activities

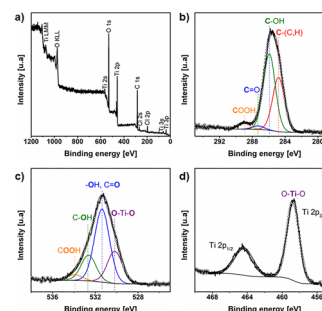
Amin Alibi, Sameh Sellami, Fatma El Abed, Nour Elleuch, Jerome Lhoste, Guillaume Duval and Mohamed Boujelbene\*



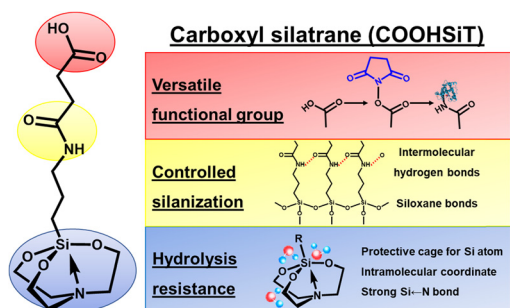
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## Stabilization of nanoporous Si/graphite composite anodes by ultrathin titanicones coatings

Tomas Kazda, Raul Zazpe, Antonín Šimek, Jhonatan Rodriguez-Pereira, Ondřej Klvač, Juliana T. Hetzel, Ludek Hromadko, David Pavlinak, Sitaramanjaneya Mouli Thalluri, Mato Knez, Kurt W. Kolasinski\* and Jan M. Macak\*



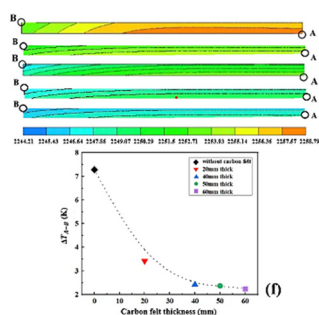
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## Controlled silanization and biomolecular conjugation *via* ultra-stable carboxyl silatrane for neurofilament light chain detection

Van-Truc Vu, Pei-Yun Hsiao, Ting-Chou Chang, Lai-Kwan Chau\* and Chun-Jen Huang\*

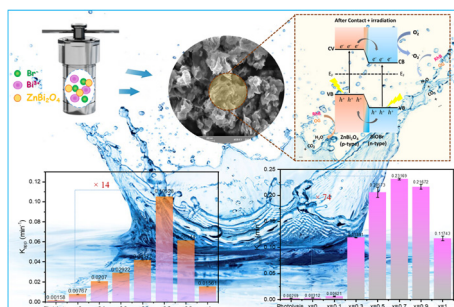
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## A numerical study on the effect of temperature gradient on the growth stability of Yb:YAG crystals grown using the EFG method

Qiming Fan, Bowen Jiang, Lu Zhang, Shaoqing Cui, Yexi Huang, Ning Jia, Hongji Qi and Mingyan Pan\*

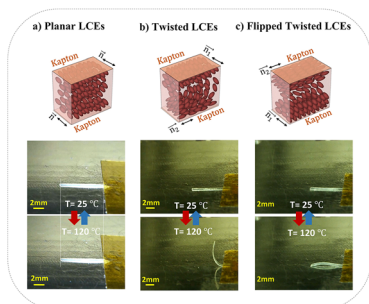
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## Construction of p-ZnBi<sub>2</sub>O<sub>4</sub>/n-BiOBr heterojunctions for efficient visible-light photocatalytic degradation of dyes

L. Mllaoiy,\* B. Bakiz,\* A. Bouddouch, S. Villain, A. Taoufyq, F. Guinneton, J.-R. Gavarri and A. Benlhachemi

1805



## Surface-induced alignment of liquid crystal elastomers on commercial polyimide-based films

Elaheh Asgari,\* Alexandre Robichaud, Paul-Vahé Cicek and Andy Shih

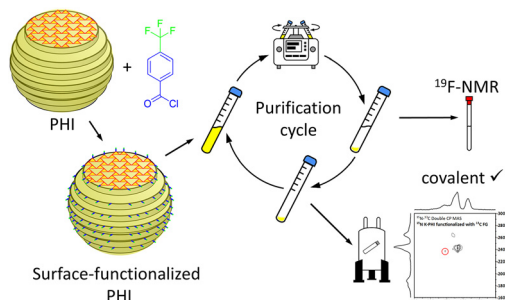


## PAPERS

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**Covalent surface functionalization of carbon nitrides: a case study of poly(heptazine imide)**

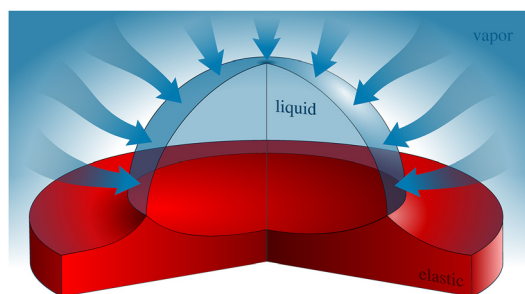
Florian Binder, Igor Moudrakovski, Nils L. Kötter, Saunak Das, Kathrin Küster, Sebastian Bette and Bettina V. Lotsch\*



1825

**Condensation on soft substrates: a mesoscopic perspective**

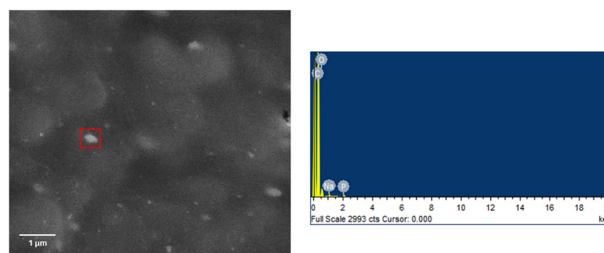
Christopher Henkel,\* Ambre Bouillant, Jacco H. Snoeijer and Uwe Thiele



1840

**Nanostructured lignin carriers for efficient flame retardant delivery in natural rubber composites**

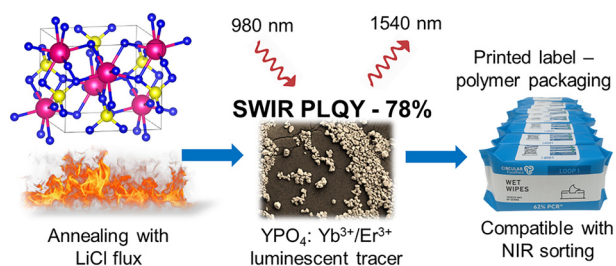
Periklis D. Alikiotis and Tizazu H. Mekonnen\*



1852

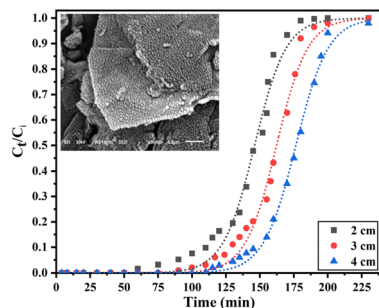
**Boosting the brightness of short-wave infrared emission in  $\text{YPO}_4:\text{Yb}^{3+}/\text{Er}^{3+}$  phosphors: optimal photoluminescence quantum yield versus particle size**

Krishnan Rajagopalan,\* Guojun Gao, Lucas J. B. Erasmus, Dmitry Busko, Bryce S. Richards and Andrey Turshatov\*



## PAPERS

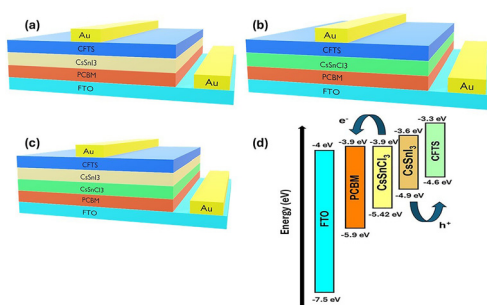
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### Eco-inspired synthesis of a melamine formaldehyde-reinforced onion peel biochar/alginate composite for efficient lead ion removal from wastewater

Sarah A. Felemban\* and Alaa O. Baryan

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### Numerical investigation of high-performance bilayer tin-based perovskite solar cells with SCAPS-1D

Hariharan Rajasekaran, Thangaraji Vasudevan and Lung-Chien Chen\*

## CORRECTIONS

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### Correction: A multiplexed tension sensor reveals the distinct levels of integrin-mediated forces in adherent cells

Xiaojun Liu, Jiangtao Li, Xiaoyun Wang, Feng Shao, Xingyou Hu, Juan Li, Lei Yu, Jicheng Zang,\* Guixue Wang\* and Yongliang Wang\*

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### Correction: Optimization of photodegradation of crystal violet dye and biomedical applications of greenly synthesized NiO nanoparticles

Abu Bakar Siddique, Muhammad Ashraf Shaheen,\* Shakra Shafeeq, Azhar Abbas, Yasir Zaman, Muhammad Zahid Ishaque and Muhammad Aslam

