

Materials Advances

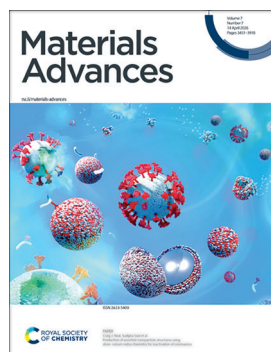
An open access journal publishing across the breadth of materials science

rsc.li/materials-advances

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

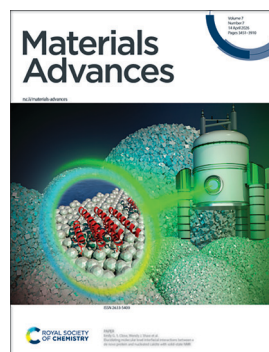
IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 7(7) 3451-3910 (2026)



Cover

See Craig J. Neal, Sudipta Seal *et al.*, pp. 3537–3544. Image reproduced by permission of Craig J. Neal from *Mater. Adv.*, 2026, 7, 3537.



Inside cover

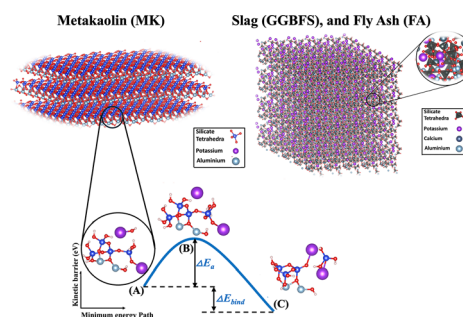
See Emily G. S. Close, Wendy J. Shaw *et al.*, pp. 3545–3558. Image reproduced by permission of Battelle Memorial Institute – Pacific Northwest National Laboratory from *Mater. Adv.*, 2026, 7, 3545.

REVIEWS

3464

Dissolution of pozzolanic materials: a critical review

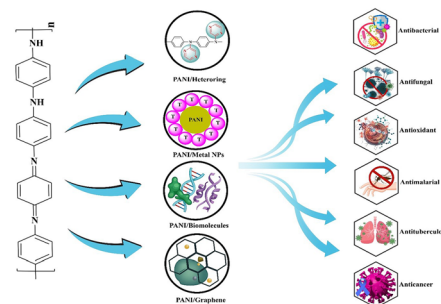
Mohammadreza Izadifar,* Reza Khorshidi, Neven Ukrainczyk, Reyhaneh Alborz and Eduardus Koenders



3495

Recent advancements in polyaniline-based composites for biological applications: a review

Chetna Kumari, Sapana Jadoun and Nirmala Kumari Jangid*



RSC Advances

At the heart of open access for
the global chemistry community

Editor-in-chief

Russell J Cox

Leibniz Universität Hannover, Germany

We stand for:



Breadth We publish work in all areas of chemistry and reach a global readership



Affordability Low APCs, discounts and waivers make publishing open access achievable and sustainable



Quality Research to advance the chemical sciences undergoes rigorous peer review for a trusted, society-run journal



Community Led by active researchers, we publish quality work from scientists at every career stage, and all countries

Submit your work now

rsc.li/rsc-advances

@RSC_Adv

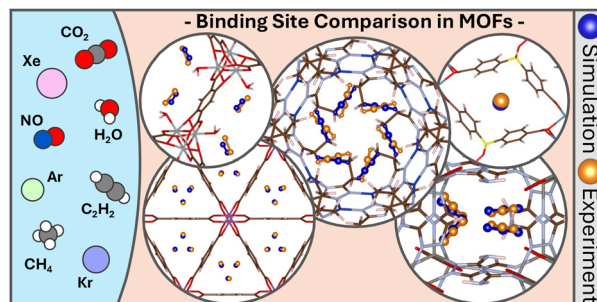


COMMUNICATIONS

3518

How well do conventional atomistic simulations predict adsorption binding sites in metal–organic frameworks compared to experiment?

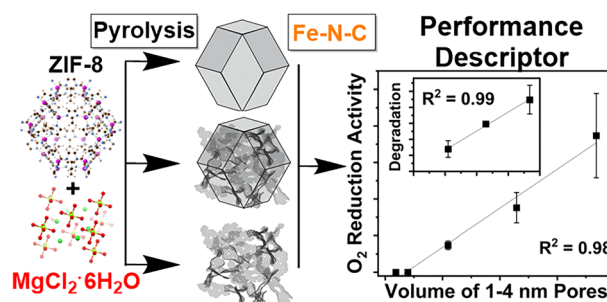
Jake Burner, Olivier Marchand, Sari Warshawsky, Marco Gibaldi and Tom K. Woo*



3524

Contribution of Mg-templated porosity to activity and durability in Fe–N–C O₂ reduction catalysts

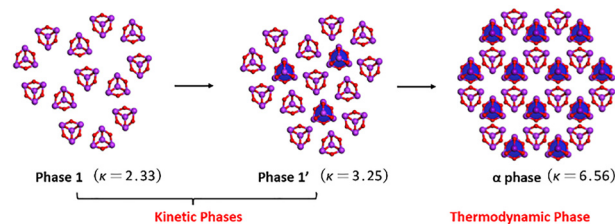
Angus Pedersen,* Jinjie Zhu, Jesús Barrio,* Joseph Parker, Robert D. Hunter, Sarah J. Haigh, Tim-Patrick Feller, Ifan E. L. Stephens and Maria-Magdalena Titirici*



3532

Interface phase engineering of monolayer Sb₂O₃ on Au(111)

Jiyuan Zhang, Haoyu Zhao,* Shuning Cai, Xueqing Yang, Yabin Zhang, Bingkai Yuan, Junyong Wang, Jingzhe Chen, Pengru Huang* and Gaolei Zhan*

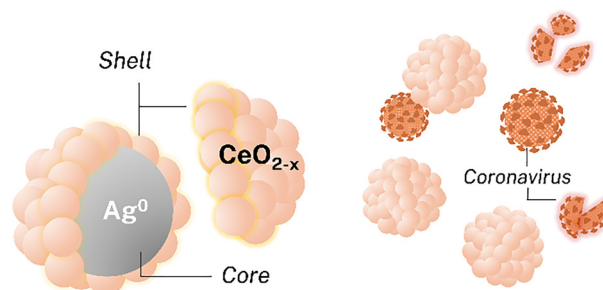


PAPERS

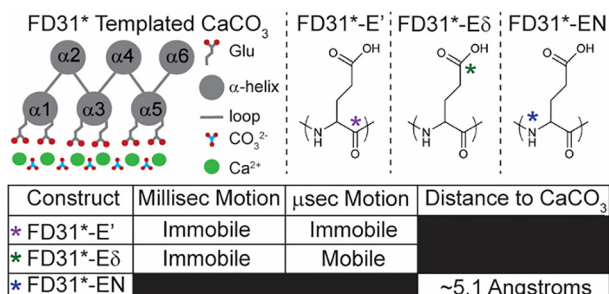
3537

Production of assorted nanoparticle structures using silver–cerium redox chemistry for inactivation of coronavirus

Craig J. Neal,* Muhammad Hassan Mehmood Kalyar, Elayaraja Kolanthai, Maria V. Bolen, Griffith D. Parks and Sudipta Seal*



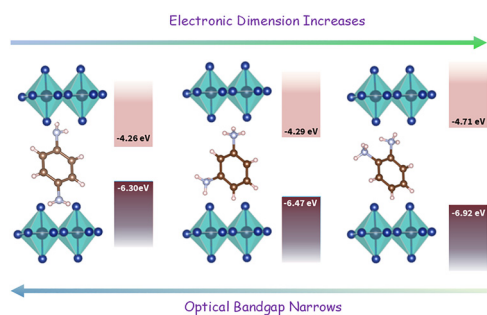
3545



Elucidating molecular level interfacial interactions between a *de novo* protein and nucleated calcite with solid-state NMR

Emily G. S. Close,* Andrew S. Lipton, Marlo Zorman, Harley Pyles, Thi Kim Hoang Trinh, Garry W. Buchko, Ying Chen, Chun-Long Chen, Christopher J. Mundy, David Baker and Wendy J. Shaw*

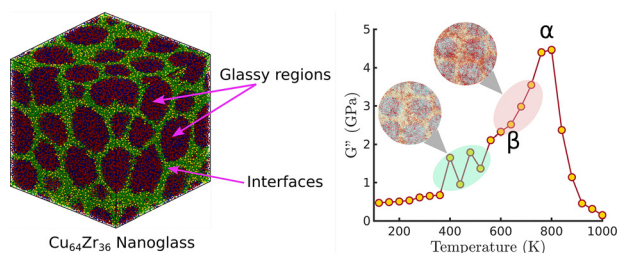
3559



Optoelectronic modulation *via* isomerism-induced structural effects in low-dimensional bismuth halide perovskites

Bharath Bhaskarbhat, S. K. Mukaddar, Altaf Pasha, Jan Grzegorz Matecki, Suman Kalyan Sahoo, Srinivas Budagumpi and R Geetha Balakrishna*

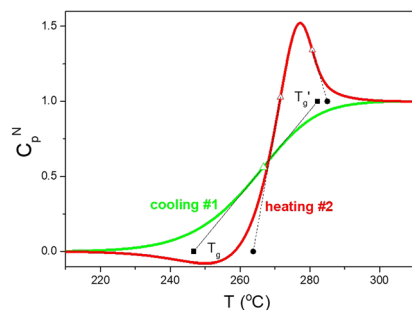
3567



Atomistic origins of viscoelasticity and β -relaxation in $\text{Cu}_{64}\text{Zr}_{36}$ metallic glass and nanoglass

Param Punj Singh, Dhyanesh Baskaran, Omar Adjaoud, Karsten Albe and Raghavan Ranganathan*

3576



The glass transition width and its dependence on fragility, nonexponentiality and nonlinearity

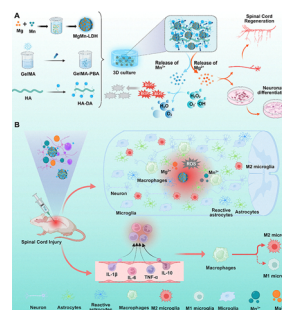
Jiří Málek



3586

ROS-scavenging and oxygen-generating MgMn-LDH integrated smart injectable hydrogel for microenvironment-reprogrammable spinal cord injury repair

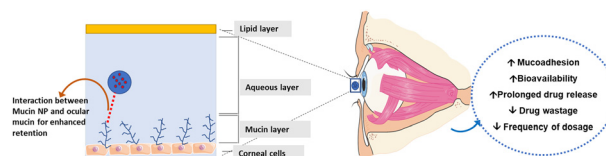
Lian Ren, Xiaobin Zhou, Longbao Feng and Guodong Sun*



3608

Natural gum-modified mucin nanocarriers with enhanced mucoadhesion and *trans*-cornea infiltration for controlled drug delivery in ocular uveitis therapy

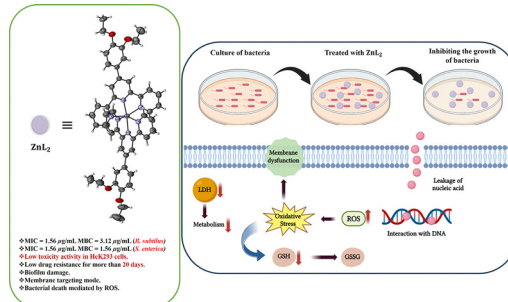
Wahida Binte Naz Aurthy, Nondita Datta, Siew Yee Wong, Xu Li, Asma Rahman, Md. Latiful Bari, Ishiaque Anwar and M. Tarik Arifat*



3627

Harnessing the zinc(II) bis-terpyridine complex to overcome drug resistance: mechanistic insights into antibacterial activity

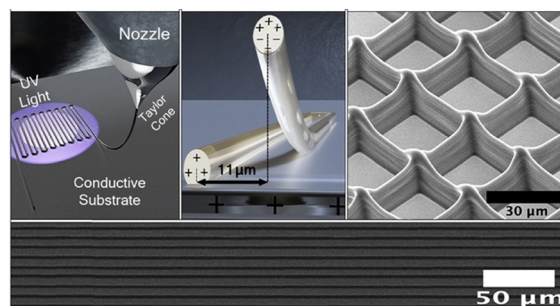
Sourav Sutradhar, Saurabh Gupta, Parnashabari Sarkar, Dipankar Das, Kamaldeep Paul* and Biswa Nath Ghosh*



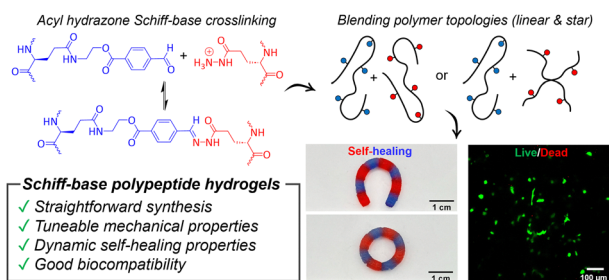
3645

Delayed crosslinking enables ultra-high-resolution melt electrowriting of responsive liquid crystal elastomers

Mehrzad Javadzadeh, María Fernández-Melero, Jesús del Barrio and Carlos Sánchez-Somolinos*



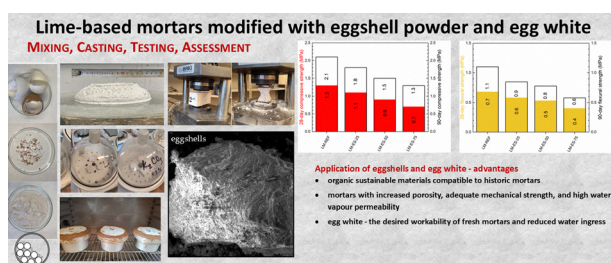
3655



The influence of polymer topology and side chain functionality on the Schiff-base reactivity of biocompatible polypeptide hydrogels

Robert D. Murphy,* Franz Lobianco, Viviane Chiaradia, Josué M. Galindo, Tom Hodgkinson and Andreas Heise

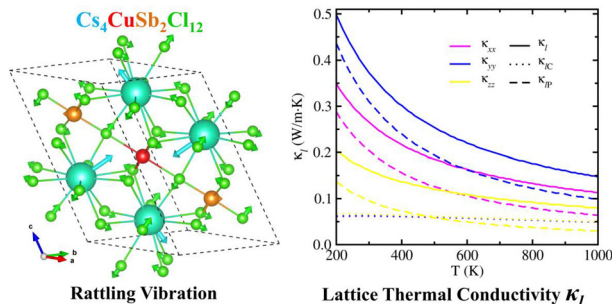
3662



Experimental assessment of lime-based mortars modified with eggshell powder and egg white – towards development of materials for repair of historic buildings

Zbyšek Pavlík,* Adam Pivák, Martina Záleská, Grzegorz Łagód, Milena Pavlíková and Ondřej Jankovský

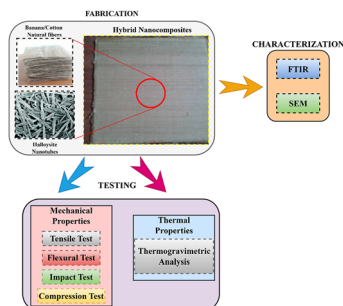
3672



Theoretical insights into lattice dynamics and thermal transport properties of lead-free quadruple halide perovskite $\text{Cs}_4\text{CuSb}_2\text{Cl}_{12}$

Un-Sok Pak,* Dok-Song Che Gal, Song-Myong Jang and Un-Gi Jong*

3681



Effect of halloysite nanotube addition on mechanical and thermal performance of banana/cotton hybrid natural fiber-reinforced polymer nanocomposites

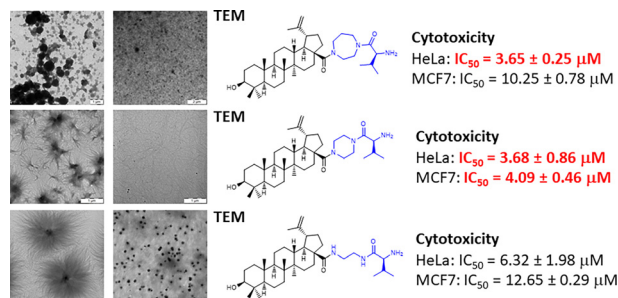
G. Umachitra, P. S. Sampath, A. Karthik, M. S. Senthilkumar, K. Ramachandran, L. Rajeshkumar* and M. Sathishkumar*



3690

Nano-assembly and cytotoxicity of the L-valine–polyamine conjugates of betulinic acid

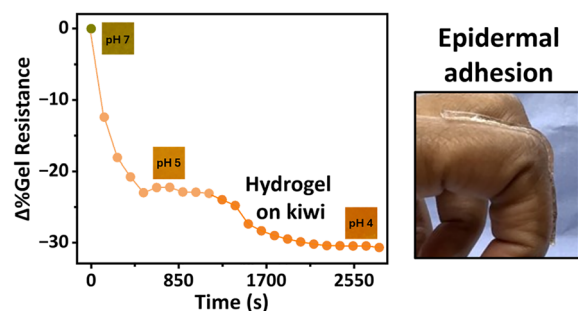
Martina Wimmerová, Miroslav Šlouf, Marie Kvasnicová, Lucie Rárová, David Šaman and Zdeněk Wimmer*



3698

Towards a wearable format for transducing responsive swelling in hydrogels

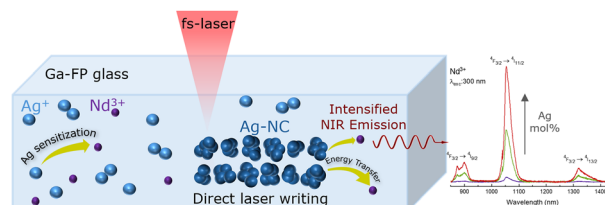
Rinki Singh,* Dinakaran Thirumalai, Tanya Levingstone and Aoife Morrin*



3708

Energy transfer from Ag species to Nd^{3+} in Ga–fluoride–phosphate glasses: near-infrared emission enhancement via controlled heat treatment and femtosecond laser inscription

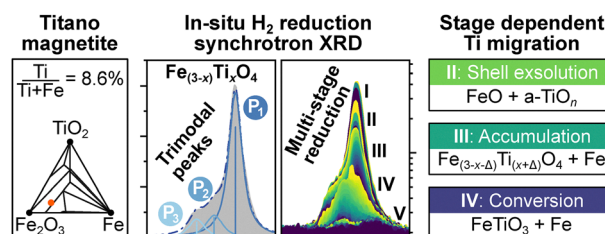
Vinicius D. Jesus,* Leonnam G. Merizio, Gustavo Galleani, Guillaume Raffy, Mathis Carpentier, Yannick Petit,* Thierry Cardinal and Andrea S. S. de Camargo*



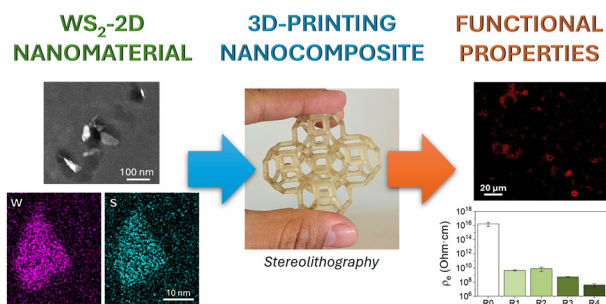
3722

In situ synchrotron X-ray diffraction studies of the high-temperature hydrogen reduction of New Zealand titanomagnetite ironsand

Morgan Lowther,* Bridget Ingham, Martin J. Ryan, Sigit Prabowo, Mohammad Nusheh, Raymond J. Longbottom, Bavinesh Maisuria, Sarah Spencer, Brian J. Monaghan, Mark H. Reid and Chris W. Bumby



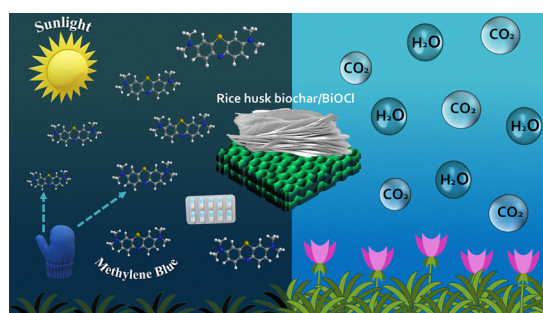
3736



Additive manufacturing of semiconductive polymer nanocomposites loaded with tungsten disulfide nanosheets

Luisa M. Valencia Liñán, Alberto Sanz de León,* Sergio I. Molina and Miriam Herrera

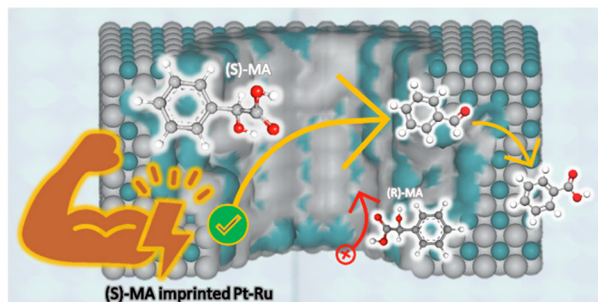
3747



Rice husk biochar-boosted BiOCl nanoplates: a sunlight-responsive route to wastewater detoxification and pathway insights for methylene blue degradation

Lovneet Kaur, Palkaran Sethi and Soumen Basu*

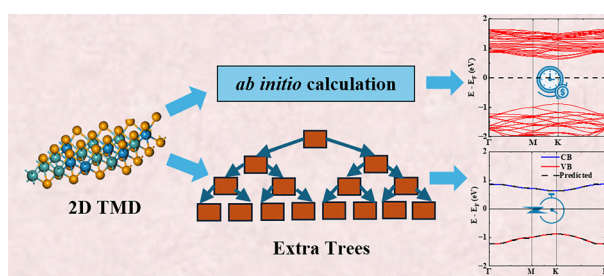
3761



Highly stable chiral bimetallic mesoporous platinum–ruthenium electrodes for enantioselective recognition

Sopon Butcha,* Natthaphong Kaewwan, Krissanapat Yomthong, Zikkawas Pasom, Alexander Kuhn and Chularat Wattanakit

3767



Machine learning-enabled prediction of the electronic band-edge shapes and properties of 2D transition metal dichalcogenide alloys

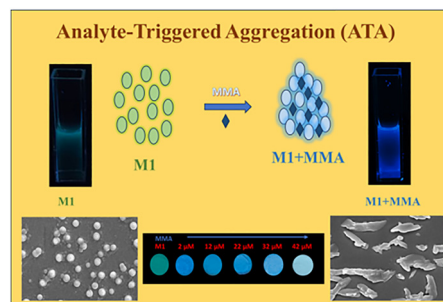
Tarvir Anjum Aditto, Vivek Chowdhury, Hafiz Imtiaz* and Ahmed Zubair*



3781

Smartphone-assisted urinary methylmalonic acid sensing using an imidazole-based probe via the analyte-triggered aggregation mechanism

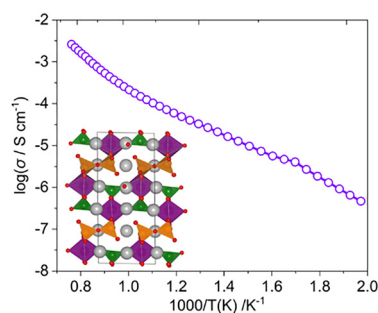
Bharat Kaushik, Ajeet Singh, Annu Agarwal, Nancy Punia and Inamur Rahaman Laskar*



3792

Dual ionic conductivity in $\text{Ba}_3\text{InGa}_2\text{O}_{7.5}$: correlating structure and electrochemical properties

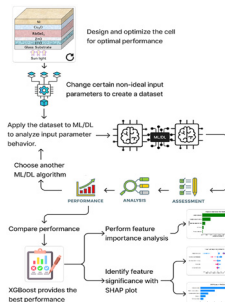
Oliver J. Wagstaff,* Archie D. Collins, John S. O. Evans and Ivana Radosavljević Evans



3800

Investigating the impact of non-ideal conditions on the performance of an RbGeI_3 perovskite solar cell through a combination of SCAPS-1D, machine learning and deep learning approaches

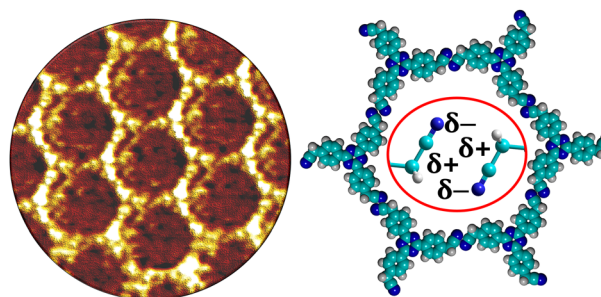
Tanvir Mahtab Khan,* Md. Atik Shams, Most. Marzia Khatun, Tahmid Ahamed, Manjuara Akter, Shajedul Hasan Arman, Mirza Md. Shakil, Hafiz Al Asad and Sheikh Rashel Al Ahmed*



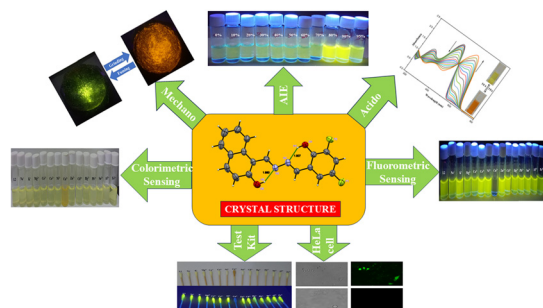
3822

Dipole-assisted nanoporous networks on surfaces

Huanjing Luo, Andrea Minoia, Vipin Mishra, Dariane Fadoras, Filippo Giovanni Fabozzi, Roberto Lazzaroni, Stefan Hecht, Kunal S. Mali* and Steven De Feyter*



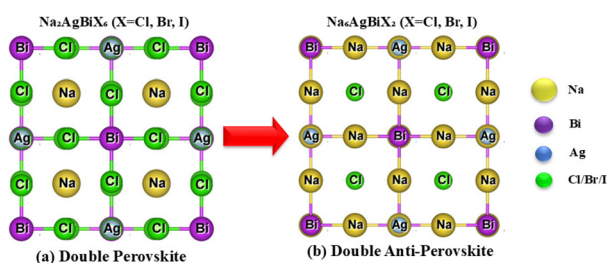
3833



Design and synthesis of an AIE-active naphthaldehyde hydrazone-based ligand: mechanochromic, acidochromic, and sensing studies

Ram Kumar Mandal, Pankaj Haloi, Abhinav Jain, Sourav Sutradhar, Jebiti Haribabu, Diego Quezada, Daniel Moraga and Pranjit Barman*

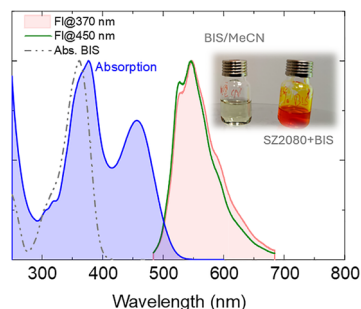
3846



Computational exploration of the diverse functional properties of double antiperovskite materials Na₆AgBiX₂ (X = Cl, Br, I)

Bisma Asghar, M. Usman Saeed, Zeeshan Ali, Shahan Ali, Irsan Saeed, A. H. Reshak, Hosam O. Elansary, Ihab Mohamed Moussa, Sohail Mumtaz* and Y. Saeed*

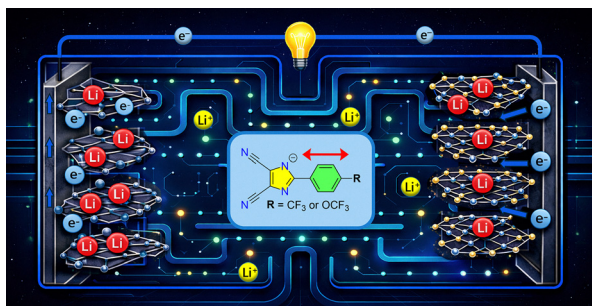
3864



Donor–acceptor complexes between photoinitiators and hybrid organic–inorganic SZZ2080™ photoresist

Marius Navickas,* Dimitra Ladika, Edvinas Orentas, Martynas Talaikis, Gediminas Niaura, Mantas Grigalavičius, Mantas Gaidys, Ricardo J. Fernández-Terán,* Mangirdas Malinauskas and Mikas Vengris

3875



Tailoring lithium dicyanoimidazolidone: structure–property relationships

Daniel Pokorný, Tomáš Syrový, Milan Klikar, Patrik Pařík, Zuzana Burešová, Lenka Řeháčková and Filip Bureš*

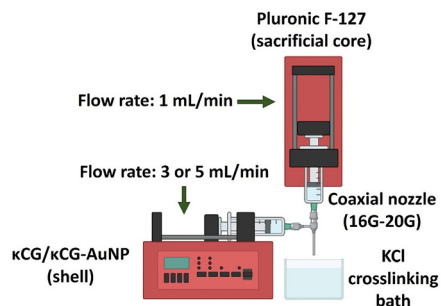


PAPERS

3885

Rheology and coaxial extrusion of acellular and cell-laden hollow conduits of pristine kappa carrageenan and gold–kappa carrageenan nanocomposite hydrogels

Sanchari Swarupa, Mata Subhashita, Nikita Chauhan, Jitendra Bahadur, Sharad Gupta and Prachi Thareja*



CORRECTION

3907

Correction: Bismuth selenide topological insulator materials for green energy devices: prospects and applications

Razieh Khaki, Mahmood Moradi,* Gholam Hossein Bordbar, Hana Kazemi, Saeid Davatolhagh and Meysam Pazoki*

