

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 5(16) 6335-6674 (2024)



Cover

See Ryota Teshima *et al.*, pp. 6368–6372.
Image reproduced by permission of Ryota Teshima from *Mater. Adv.*, 2024, 5, 6368.

EDITORIAL

6346

Introduction to Advanced materials for sensing and biomedical applications

Yogendra Kumar Mishra, Ajeet Kaushik and Avtar Singh

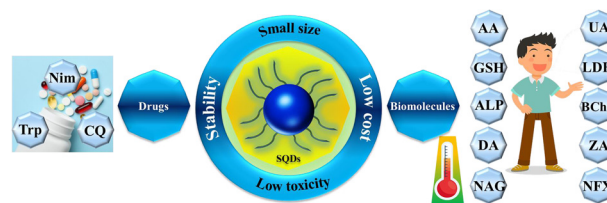


REVIEW

6351

Sulfur quantum dots for fluorescence sensing in biological and pharmaceutical samples: a review

Kawan F. Kayani,* Sewara J. Mohammed, Nian N. Mohammad, Ahmed M. Abdullah, Diary I. Tofiq, Muhammad S. Mustafa, Dler M. S. Shwan and Shujahadeen B. Aziz



Environmental Science journals

One impactful portfolio for
every exceptional mind

Harnessing the power of interdisciplinary
science to preserve our environment



rsc.li/envsci

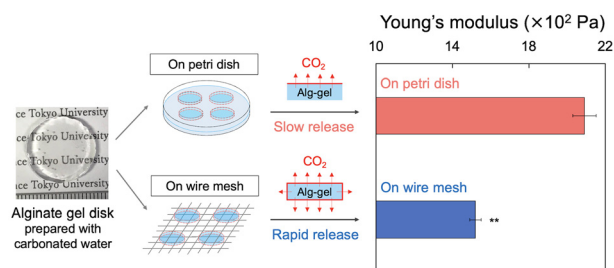
Fundamental questions
Elemental answers



6368

Effect of CO₂ release behavior on the crosslinking degree of alginate hydrogels prepared with CaCO₃ and carbonated water

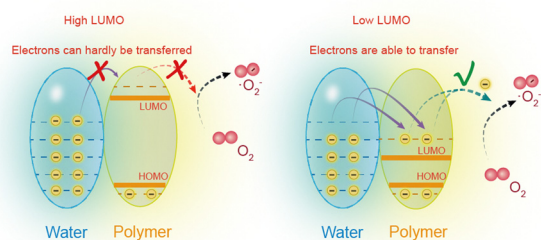
Ryota Teshima,* Shigehito Osawa, Kaoru Hirose, Yayoi Kawano, Akihiko Kikuchi, Takehisa Hanawa and Hidenori Otsuka



6373

A perspective on contact-electro-catalysis based on frontier molecular orbitals

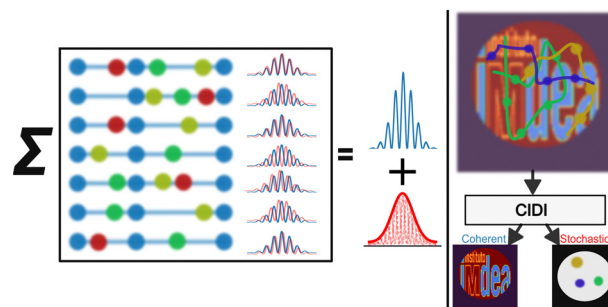
Ziming Wang, Xuanli Dong, Fu-Jie Lv and Wei Tang*



6378

Coherent X-ray imaging of stochastic dynamics

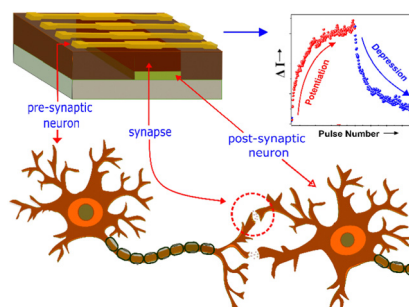
Arnab Sarkar and Allan S. Johnson*



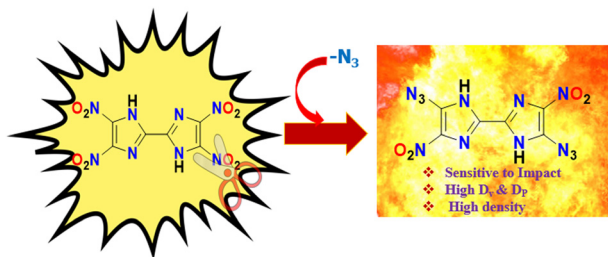
6388

Emulating synaptic plasticity with a poly[N-(3-(9H-carbazol-9-yl)propyl)methacrylamide] memristor

Yadu Ram Panthi, Ambika Pandey, Adriana Šturcová, Drahomír Výprachtický, Stephen H. Foulger and Jiří Pflieger*



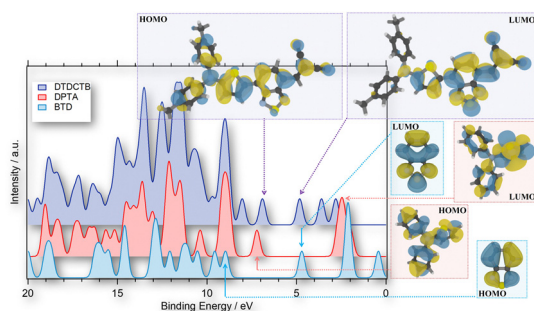
6399



One step synthesis of nitrogen-rich green primary explosives from secondary explosives: synthesis, characterization, and performance study

Parasar Kumar, Vikas D. Ghule and Srinivas Dharavath*

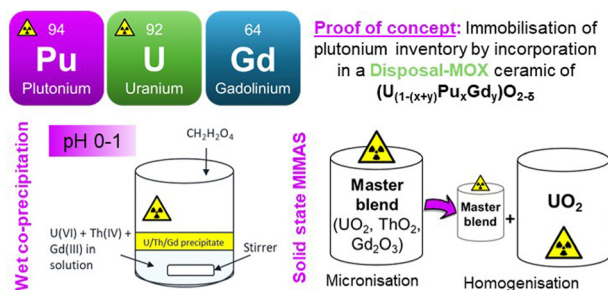
6405



Gas phase electronic structure of the DTDCTB small-molecule donor for vacuum-processed organic photovoltaics compared to its constituent building blocks

Ambra Guarnaccio,* Iulia Emilia Brumboiu,* Cesare Grazioli, Teng Zhang, Fredrik O. L. Johansson, Marcello Coreno, Monica de Simone and Carla Puglia

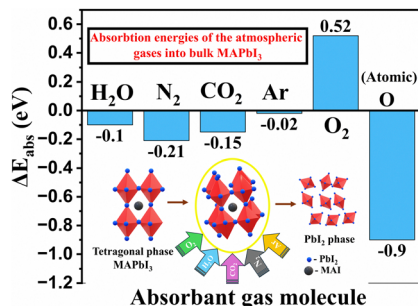
6416



A disposal-MOX concept for plutonium disposition

Max R. Cole, Lewis R. Blackburn, Latham T. Haigh, Daniel J. Bailey, Luke T. Townsend, Kristina O. Kvashnina, Neil C. Hyatt and Claire L. Corkhill*

6426



Unravelling the environmental degradation mechanism of perovskite thin films

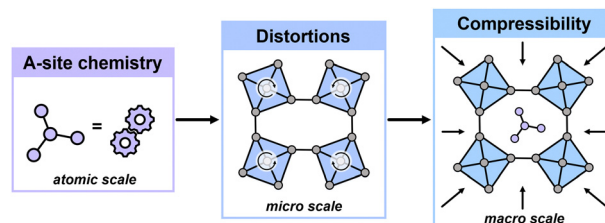
Nalini V, Gergely N. Nagy, Ariful Rahaman, Sreeram K. Kalpathy, Tiju Thomas, Sumangala T. P.* and Mousumi Upadhyay Kahaly*



6440

Tuning the mechanical properties of molecular perovskites by controlling framework distortions via A-site substitution

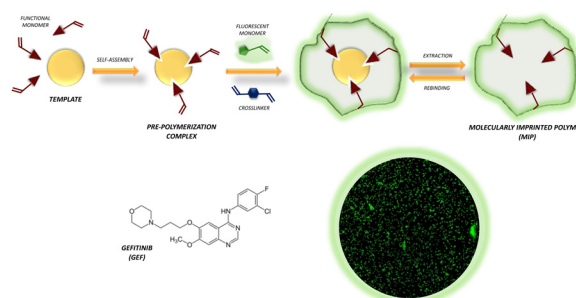
Silva M. Kronawitter, Shinjoo Park, Sebastian A. Hallweger, Emily Myatt, Jem Pitcairn, Matthew J. Cliffe, Dominik Daisenberger, Markus Drees and Gregor Kieslich*



6446

Exploring crosslinker effects on fluorescent molecularly imprinted polymers for improved gefitinib delivery in lung cancer theranostics

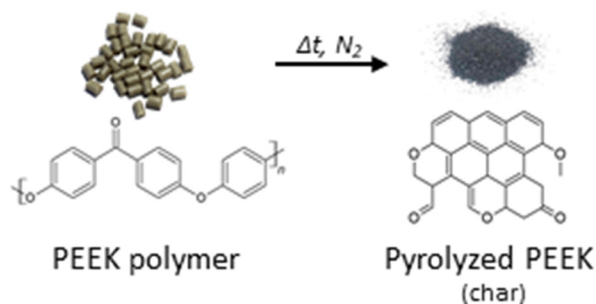
Marco Dattilo, Marisa Francesca Motta, Francesco Patitucci, Claudia Ferraro, Ortensia Ilaria Parisi* and Francesco Puoci



6458

Microporous carbonaceous adsorbent prepared from a pyrolyzed polymer

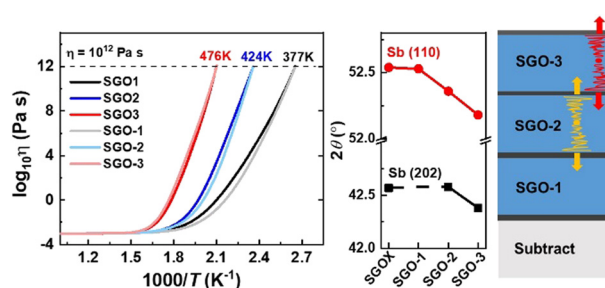
Jaroslav Lang,* Jan Bednárek, Michal Ritz, Martin Kormunda, Tomáš Zelenka, Michal Vaštyl, Anna Gavlová, Zdeňka Kolská and Marta Férová



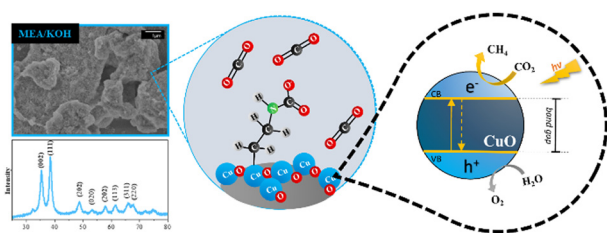
6469

Crystallization kinetics of stacked phase-change films for multi-level storage

Yimin Chen,* Ce Fan, Nan Han, Kexing Peng, Chenjie Gu, Zijun Liu, Guoxiang Wang, Tiefeng Xu, Junqiang Wang and Xiang Shen*



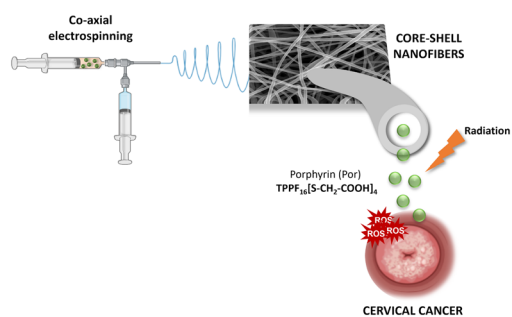
6479



Unveiling the influence of alkaline modifiers in CuO synthesis on its photocatalytic activity for CO₂ reduction

Jéssica C. de Almeida, Thais Aparecida Rodrigues, Gelson T. S. T. da Silva, Caue Ribeiro* and Vagner R. de Mendonça*

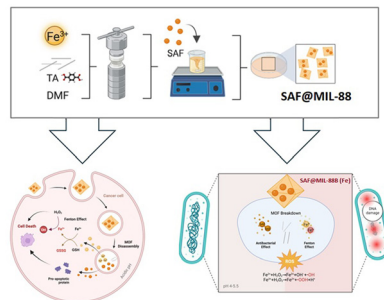
6489



Localized cancer photodynamic therapy approach based on core-shell electrospun nanofibers

Sofia M. Costa,* Leandro M. O. Lourenço, Ricardo C. Calhelha, Isabel Calejo, Cristina C. Barrias, Raul Figueiro and Diana P. Ferreira*

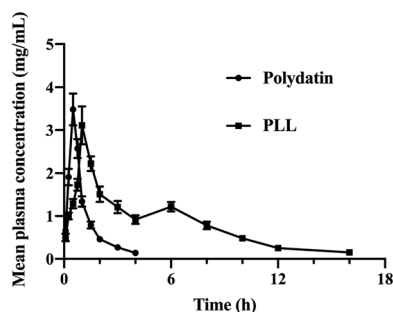
6501



Synthesis and characterization of safranal@MIL-88B(Fe) nanostructures and their preliminary anticancer and antibacterial characteristics

Alia Alkaabi, Khansa Ahsan, Nayla Munawar, Abdelouahid Samadi, Hesham El-Maghraby, Amr Amin and Yaser Greish*

6516



Advancing diabetes treatment: novel formulation of polydatin long-circulating liposomes and their glucose-regulating impact on hyperlipidemia-induced type 2 diabetic mice

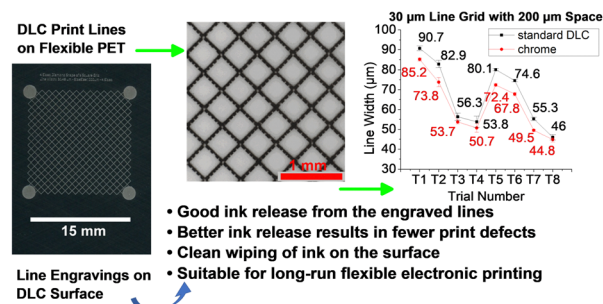
Kepei Zhang, Junlan Chen, Faisal Raza, Hajra Zafar, Ye Xu, Ran Li, Kamran Hidayat Ullah and Shigao Zhou*



6535

DLC-engineered flat gravure surface: enabling sustainable fabrication to replace chrome for printing conductive line electrodes in flexible electronics

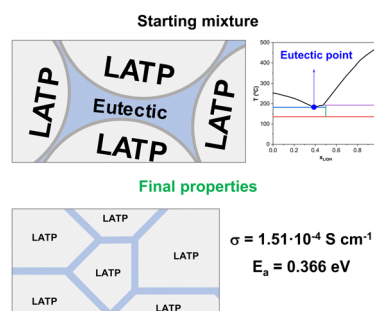
Chandramohan Seetharamiahsrinivasaraju,* Ronit Shetty, Donald K. Cohen, Priyanka Sharma* and James R. Springstead



6554

Hydroflux-assisted cold sintering: eutectic mixtures for boosting ionic conductivity in LATP solid-state electrolytes

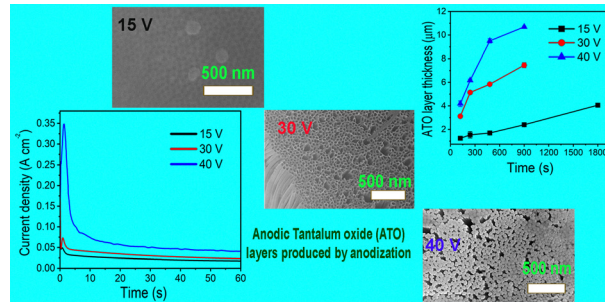
Andrés Mormeneo-Segarra, Sergio Ferrer-Nicomedes, Nuria Vicente-Agut* and Antonio Barba-Juan



6560

Understanding the morphological evolution of anodic tantalum oxide nanostructures in acidic medium

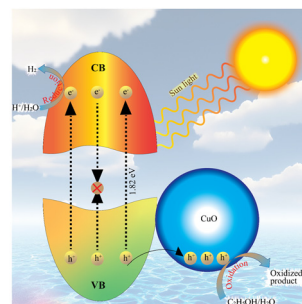
Biswaranjan D. Mohapatra,* Kinga Pawlik, Izabela Darowska, Łukasz Gondek, Marcin Pisarek and Grzegorz D. Sulka*



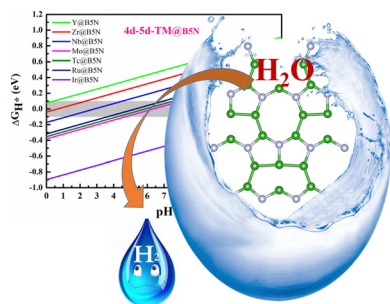
6572

Insights into the development and performance of CuO/CuFe₂S_xO_{4-x} catalysts: an effective approach for renewable hydrogen generation

Ejaz Hussain,* Muhammad Jalil, Muhammad Zeeshan Abid, Javeria Mansab, Raed H. Althomali, Shuxin Wang, Abdul Rauf and Khezina Rafiq*



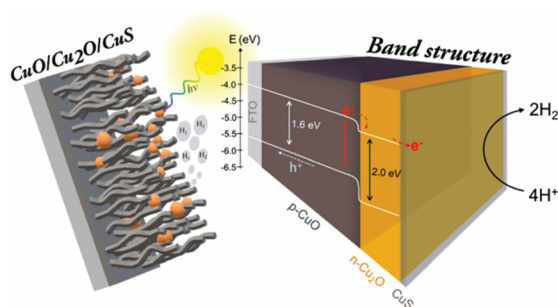
6586



Single-atom transition metals doping two-dimensional B_xN materials ($X = 2, 3, 5$) with promising electrocatalytic activity for efficient hydrogen production in the entire pH range

Yuhua Wei, Feng Gao,* Hong Liu, Wei Qi, Sichao Du, Hao Xie and Duo Xiao

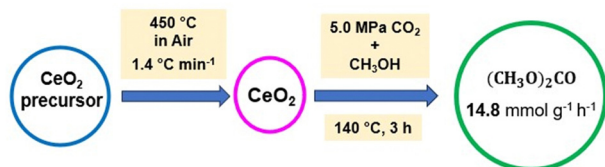
6596



Enhanced photoelectrochemical water splitting using nanostructured films: p-CuO sensitized with polyhedral n-Cu₂O particles and CuS as photocathode

Hugo Leandro Sousa Santos and Lucia Helena Mascaro*

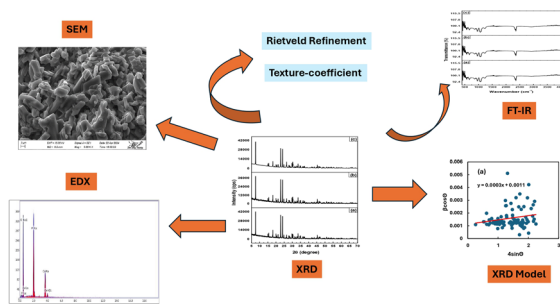
6605



Porous ceria materials for efficient direct conversion of carbon dioxide and methanol to dimethyl carbonate

Zhuxian Yang, Justin Tay Zheng, Xinhuan Lu, Monica Mengdie Lin, Dongming Cai, Yankun Wang, Wen-Yueh Yu,* Yanqiu Zhu and Yongde Xia*

6618



Sustainable synthesis and characterization of nano-triple superphosphate from solid marine wastes

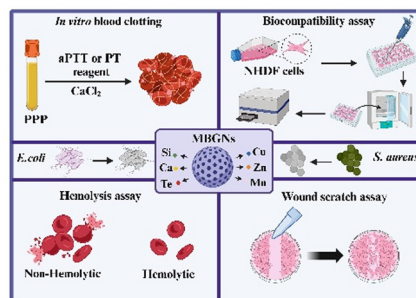
Md. Kawcher Alam, Md. Sahadat Hossain, Mohammad Saimon Islam, Newaz Mohammed Bahadur and Samina Ahmed*



6630

The effect of mesoporous bioactive glass nanoparticles incorporating various metallic ions (Cu, Zn, Mn, Te) on wound healing

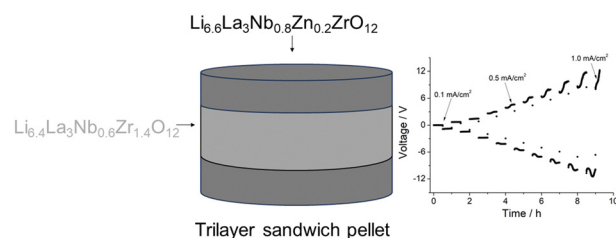
Sara Pourshahrestani,* Ehsan Zeimaran, Christina Janko, Christoph Alexiou, Andrea Kerpes, Adrian Würz, Marcus Fischer, Hana Kaňková, Martin Hartmann and Aldo R. Boccaccini*



6648

Experimental and computational study of Zn doping in $\text{Li}_{5+x}\text{La}_3\text{Nb}_{2-x}\text{Zr}_x\text{O}_{12}$ garnet solid state electrolytes

Bo Dong,* Bassey Oboho, Linhao Li, Xiao Tao, Pengcheng Zhu, Mark P. Stockham, Chuan Li, Roger Smith, Yongliang Li, Yulong Ding, Pooja Goddard* and Peter R. Slater*



6661

Fabrication of composite scaffolds using hydroxyapatite, epoxy resin and silica for load-bearing applications

Md. Kawcher Alam, Md. Sahadat Hossain, Newaz Mohammed Bahadur and Samina Ahmed*

