

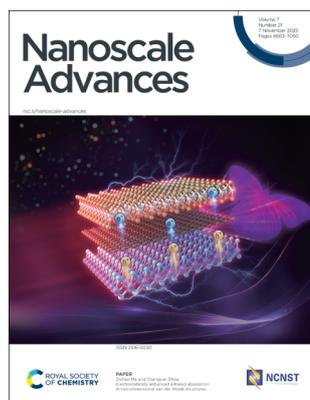
Nanoscale Advances

An open access journal publishing across the breadth of nanoscience and nanotechnology
rsc.li/nanoscale-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 2516-0230 CODEN NAADAI 7(21) 6663–7050 (2025)



Cover

See Zichao Ma and Changjian Zhou, pp. 6819–6827. Image reproduced by permission of Zichao Ma from *Nanoscale Adv.*, 2025, 7, 6819.

EDITORIAL

6674

Introduction to Advances in nanophotonics, plasmonics, and nano-optics

Viktoriia E. Babicheva,* Yu-Jung Lu, Alexander Shalin and Dattatray Late

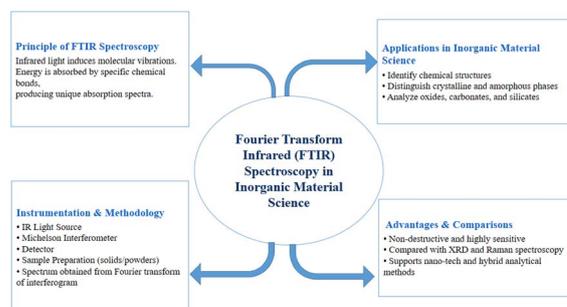


REVIEWS

6677

Fourier transform infrared spectroscopic technique for analysis of inorganic materials: a review

Kazi Al-Amin, Md. Kawsar,* Md. Tariqur Rahaman Bhuiyan Mamun and Md. Sahadat Hossain*



**GOLD
OPEN
ACCESS**

EES Solar

**Exceptional research on solar
energy and photovoltaics**

Part of the EES family

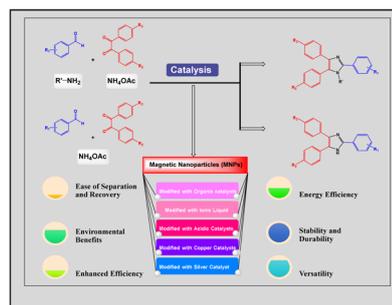
**Join
in** | Publish with us
rsc.li/EESSolar

REVIEWS

6703

Magnetic catalyst marvels: a sustainable approach to highly substituted imidazole synthesis

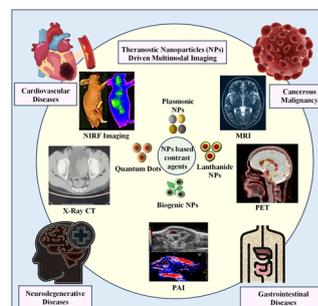
Mosstafa Kazemi,* Ramin Javahershenas,*
Jayanti Makasana, Suhas Ballal, Munther Kadheem,
Abhayveer Singh, Kattela Chennakesavulu
and Kamal Kant Joshi



6753

Novel advancements in nanomaterials-based contrast agents across multimodal imaging and theranostic applications

Harshita Tiwari, Swati Singh, Rajiv Kumar, Abhijit Mandal,
Abhishek Pathak, Navin Kumar Verma,* Lalit Kumar
and Vibhav Gautam*

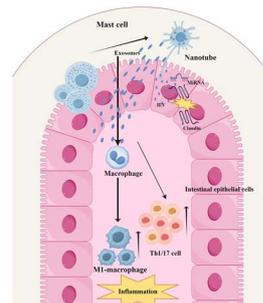


MINIREVIEW

6774

Mast cell-derived exosomes and claudin regulation in ulcerative colitis: emerging insights and therapeutic potential

Shao-han Li, Hao-ming Xu, Hong-li Huang*
and Yong-jian Zhou*

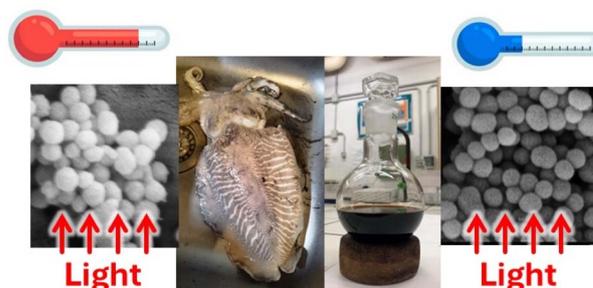


COMMUNICATIONS

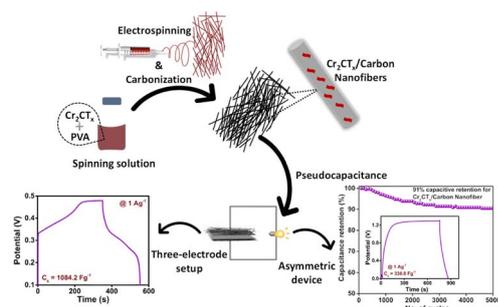
6786

A simple method to distinguish light scattering from light absorption by nanoparticles

Arianna Menichetti, Dario Mordini, Enrico Rampazzo,
Agata Pane, Silvia Vicenzi, Vasilis Petropoulos,
Giulio Cerullo, Fabrizio Mancin* and Marco Montalti*



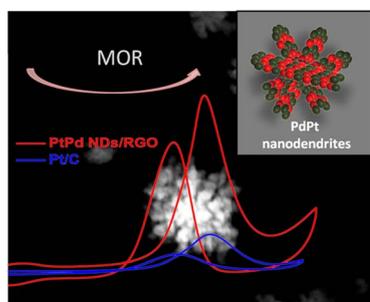
6791



Unveiling the supercapacitive behavior of electrospun Cr_2CT_x /carbon nanofiber membrane

R. Madhushree, K. R. Sunajadevi,* K. P. Chaithra, T. P. Vinod* and B. Saravanakumar

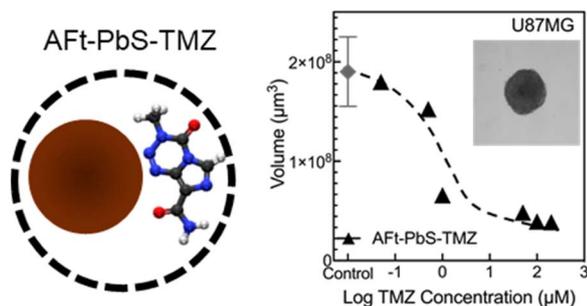
6796



Lattice add-ons with low-content Pd incorporated into Pt nanodendrites revealed active methanol oxidation *via* the fast removal of poisonous intermediates

Ammar Bin Yousaf,* Asad Ali and Peter Kasak*

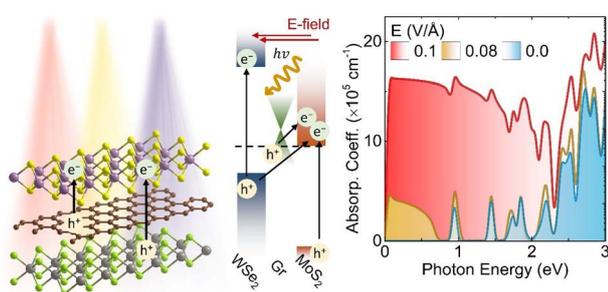
6808



Co-encapsulation of temozolomide and PbS quantum dots in apoferritin for transferrin receptor 1 targeting, imaging and treatment of glioblastoma

Reyhan Dilsu Colpan, Ellie B. Ward, Dongling Zhang, Binbing Ling, Umar Iqbal, Maria Moreno, Neil R. Thomas, Lyudmila Turyanska* and Tracey D. Bradshaw*

6819



Electrostatically enhanced infrared absorption in two-dimensional van der Waals structures

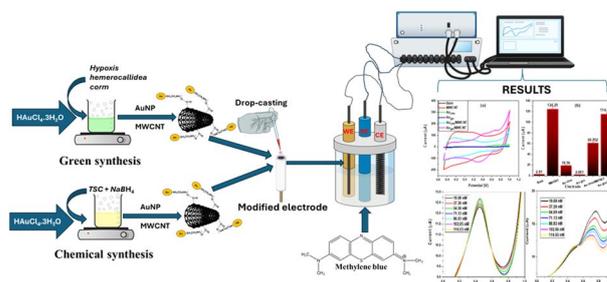
Zichao Ma and Changjian Zhou*



6828

A nano-powered green and chemically synthesized Au/MWCNT modified electrochemical sensor for methylene blue detection in river water

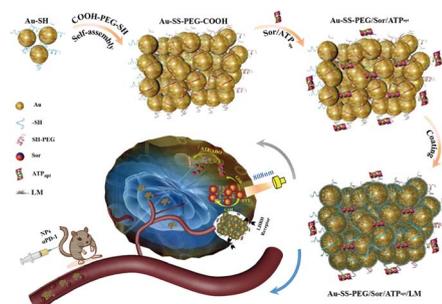
Seleke J. Mokole and Omolola E. Fayemi*



6851

A stepwise responsive Au-SS-PEG/Sor/ATP_{aptamer}/LHRH-MPG^{ANLS} drug delivery vector system for overcoming drug resistance in immunotherapy of hepatocellular carcinoma

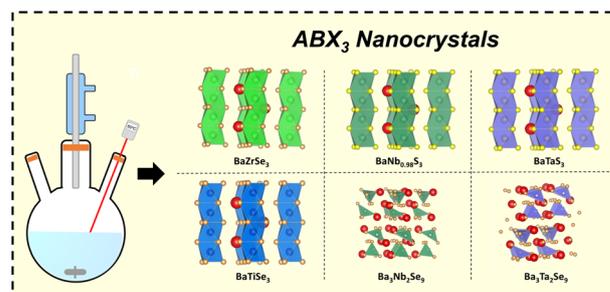
Mengting Tong, Guangpeng Chen, Yong Dong, Yubin Pan, Yanan Xue and Da Li*



6864

Hexagonal ABX₃ nanocrystals: rod-shaped BaNbS₃ and BaTaS₃; BaTiSe₃, BaZrSe₃, and other selenide derivatives for optoelectronic applications

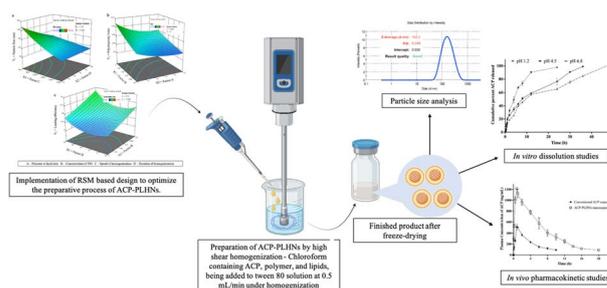
Shubhanshu Agarwal, Sofia Rodriguez Perilla, Matheus Rios Marques, Daniel C. Hayes, Kiruba Catherine Vincent and Rakesh Agrawal*



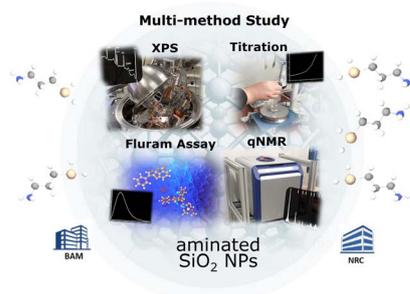
6874

Improving oral bioavailability of acalabrutinib using polymer–lipid hybrid nanoparticles: design, optimization, and *in vivo* pharmacokinetic evaluation

Swagata Sinha, Punna Rao Ravi,* Sahadevan Rajesh Rashmi and Lakshmi Koumudi Devaraju



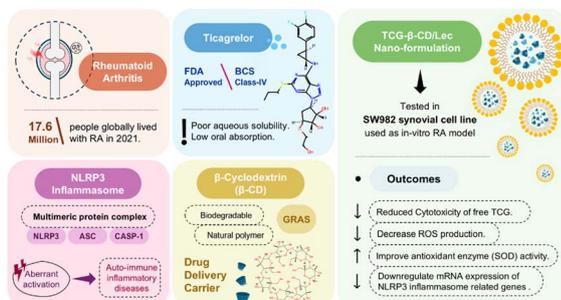
6888



Quantifying surface groups on aminated silica nanoparticles of different size, surface chemistry, and porosity with solution NMR, XPS, optical assays, and potentiometric titration

Isabella Tavernaro,* Isabelle Rajotte, Marie-Pier Thibeault, Philipp C. Sander, Oltion Kodra, Gregory Lopinski, Jörg Radnik, Linda J. Johnston, Andreas Brinkmann* and Ute Resch-Genger*

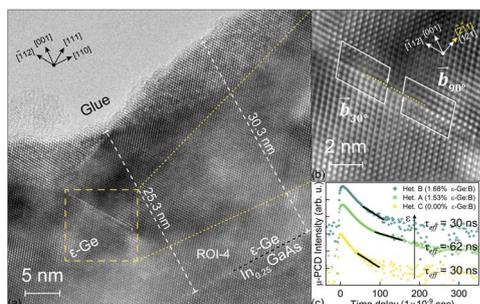
6901



Synthesis, characterization and *in vitro* evaluation of ticagrelor and its nano-formulation targeting the NLRP3 inflammasome pathway in synovial cells

Zainab Najam, Anum Gul,* Muhammad Kawish, Muhammad Raza Shah, Tooba Aslam and Nida Dastagir

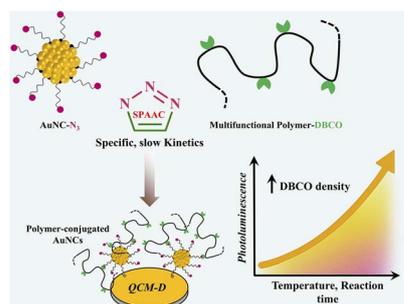
6915



Heavy boron doping effects on biaxially tensile strained germanium (>1.5%) investigated via structural characterization, effective lifetime assessment and atomistic modeling

Shuvodip Bhattacharya, Steven W. Johnston and Mantu K. Hudait*

6929



Bioorthogonal conjugation of NIR luminescent gold nanoclusters with multifunctional polymers: insights into binding efficiency, kinetics, and optical properties

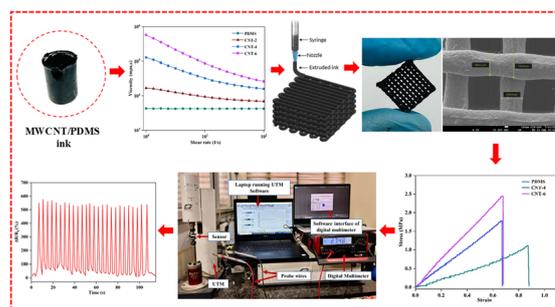
Furhan Abdul Rezak, Pelin Catal, Lola Mantout, Fernande Da Cruz, Didier Boturyn, Jean-Luc Coll, Arnaud Favier, Galina V. Dubacheva* and Xavier Le Guével*



6941

Development of flexible piezoresistive pressure sensors via direct ink writing of MWCNT/PDMS nanocomposite inks: rheological and electromechanical characterization

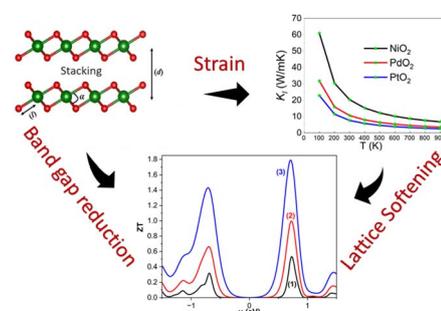
Jashanpreet Singh Sidhu,^{*} Aviral Misra and Arvind Bhardwaj



6954

Enhanced thermoelectric performance, inter-layer coupling effects and reduced lattice thermal conductivity in two-dimensional transition metal oxides

Aadil Fayaz Wani, Kulwinder Kaur,^{*} Baljinder Kaur, Sikander Iqbal, Shobhna Dhiman and Shakeel Ahmad Khandy^{*}

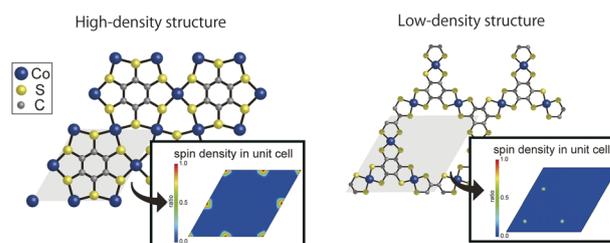


6964

Strain effects on the electronic properties of cobalt-based coordination nanosheets

Kento Nishigomi, Yu Yi, Souren Adhikary, Kazuhito Tsukagoshi and Katsunori Wakabayashi^{*}

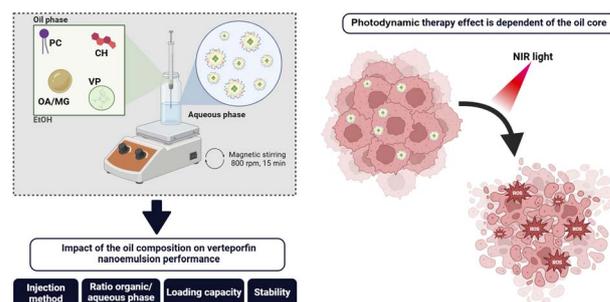
Cobalt-Based Coordination Nanosheets



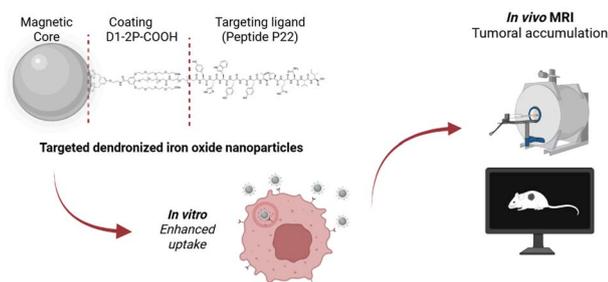
6972

Impact of oil phase composition on the efficacy of nanoemulsions for verteporfin-mediated photodynamic therapy in ovarian cancer

Laura Fuentes Varela, María Emilia Vasquez, Carmen Abuín Redondo, Andrea Estrella Arias-Díaz, Miguel Abal, Clotilde Costa, Roberto Piñero, Irene Villa, Ekaterina A. Kukushkina, Lucía Lama, Antía Cabezas, Rafael López López^{*} and Ana B. Dávila-Ibáñez^{*}



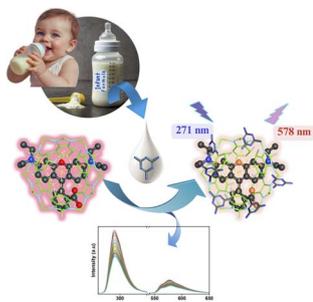
6987



In vitro and *in vivo* validation studies of optimized iron oxide nanoparticles carrying targeting ligands for a new therapeutic strategy in head and neck cancers

Sonia Furguele, Thomas Gevert, Barbara Freis, Maria Los Angeles Ramirez, Géraldine Descamps, Sébastien Boutry, Lionel Larbanoix, Dorianne Sant'Angelo, Anne Trelcat, Sven Saussez, Sylvie Bégin-Colin, Fabrice Journe and Sophie Laurent*

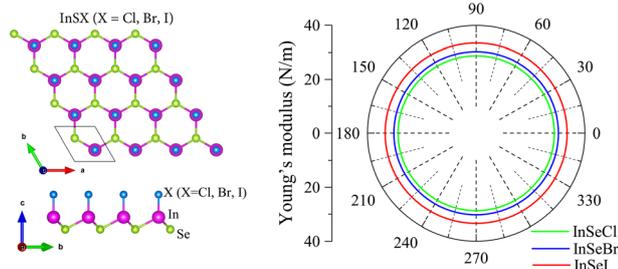
7003



Hierarchically porous RhB-encapsulated ZIF-7 as a dual-emission fluorescence probe for ultrasensitive detection of melamine in infant formulations

Sreevidhya K. B. and Suvadhan Kanchi*

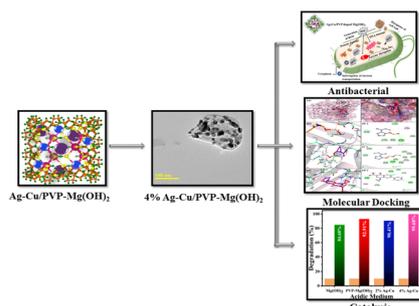
7015



First-principles investigation of the electronic, piezoelectric and transport properties of InSeX ($X = \text{Cl, Br, I}$) monolayers

D. Vo Dat, Tuan V. Vu, A. I. Kartamyshev, Thi H. Ho, Hoang-Thinh Do, Vu Khac Hoang Bui, Phan T. H. Linh and Nguyen D. Hien*

7028



Synergistic catalytic and antibacterial activity, along with *in silico* molecular docking of bimetallic silver-copper-doped PVP-Mg(OH)_2 nanostructures

Zarqa Altaf, Muhammad Imran,* Ali Haider,* Iram Shahzadi, Zernab Mateen, Anwar Ul-Hamid, Ahmed M. Fouda and Muhammad Ikram



7040

A Pitstop-2 analog impairs viability of aggressive lung cancer cells by disrupting nuclear pore integrity

Silvio Terra Stefanello,* Caren Rigon Mizdal, Christian Paul Konken, Günter Haufe and Victor Shahin*

