

Materials Advances

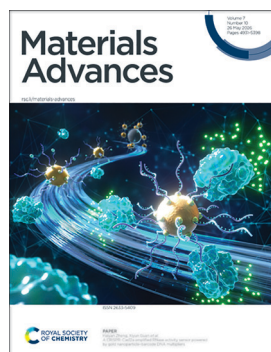
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Cover

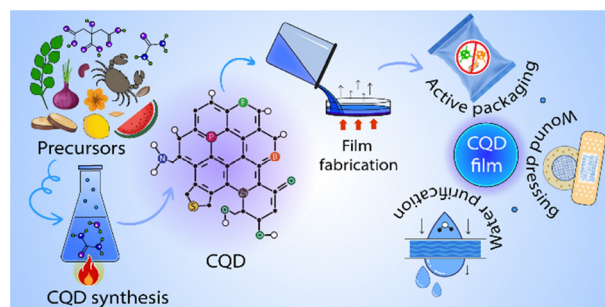
See Haiyan Zheng, Xiyun Guan *et al.*, pp. 4973-4982. Image reproduced by permission of Xiyun Guan from *Mater. Adv.*, 2026, 7, 4973.

REVIEW

4943

Carbon quantum dot-based thin films for multifunctional and sustainable applications

Arup Kumer Roy, Ayesha Binth Humayun, Yuv-raj Acharjee, Nusrat Jahan Usha and Sumit Majumder*

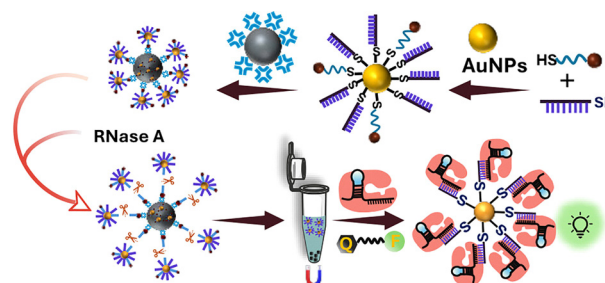


PAPERS

4973

A CRISPR-Cas12a amplified RNase activity sensor powered by gold nanoparticle-barcode DNA multipliers

Sathishkumar Munusamy, Rana Jahani, Jun Chen, Shuo Zhou, Juanhua Kong, Haiyan Zheng* and Xiyun Guan*



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Substituent-directed assembly of 1D and 2D silver aryl tellurolates with tunable emission

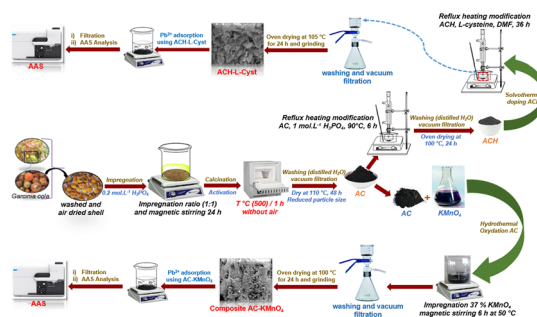
Komal Rani, Anietie W. Williams, Tarun Kaushik, Daniel W. Paley, Maggie C. Willson, Masha Aleksich, Patience A. Kotei, Mark R. Warren, Adrian P. Mancuso, Kerry Gilmore, Aaron S. Brewster* and J. Nathan Hohman*



4992

Ex situ modification of activated carbon through hydrothermal oxidation and sulphur@amine doping for highly efficient Pb²⁺ sorption: experimental and modelling approaches

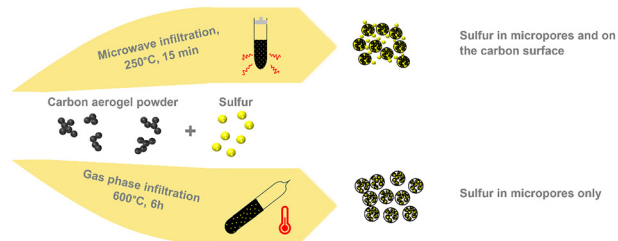
Idris-Hermann Tiotsop Kuete,* Cyrille Ghislain Fotsop, Alexandra Lieb and Franziska Scheffler*



5016

Capturing sulfur: a comparative study on sulfur infiltration techniques of carbon aerogels and novel methods for microstructural analysis

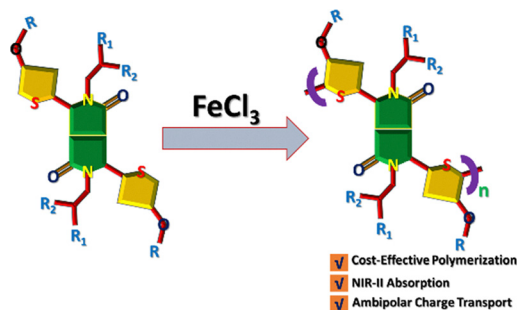
Marina Schwan,* Jessica Kröner, Henrike Niehoff, Peter Wagner and Barbara Milow



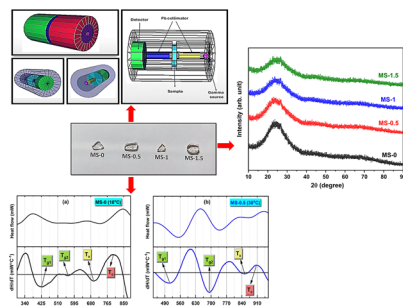
5030

Facile synthesis of ultralow-band-gap alkoxythiophene-flanked diketopyrrolopyrrole homopolymers via FeCl₃-mediated oxidative polymerization

Samala Venkateswarlu, Ravinder Singh, Songbo Cui, Andrew Stella, Jimmy Papazotos, Naixin Zhao, Yi Yuan, Haitao Liu, Xu Li, Jinliang Wang and Yuning Li*



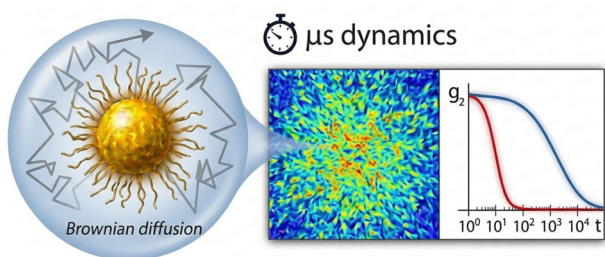
5041



Influence of Sm_2O_3 substitution on the mechanical properties, crystallization kinetics, radiation shielding and Judd–Ofelt analysis of borosilicate glasses

Santosh Kumar, Savidh Khan,* Km Abida, F. E. Mansour, R. B. Malidarreh, H. M. H. Zakaly and A. Saleh

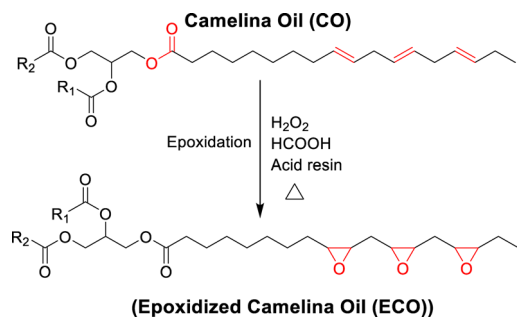
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XPCS at the microsecond frontier: diffusion of PEGylated nanoparticles in water

Nele N. Striker, Florian Schulz, Claudia Goy, Jonathan Correa, Adriana Simancas, Francesco Dallari, Daniele Marzi, Randeer Pratap Gautam, Carlos Arauz-Moreno, Robert P. C. Bauer, William Chèvremont, Marco Cammarata, Heinz Graafsma, Frédéric Caupin and Felix Lehmkuhler*

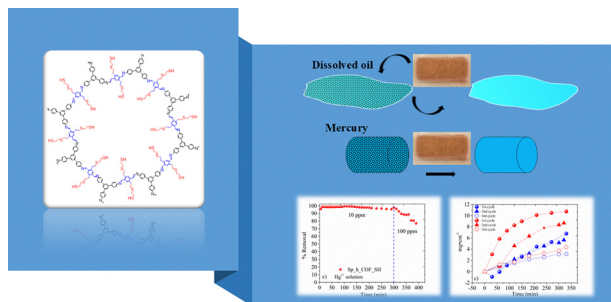
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Epoxidized camelina oil as a renewable plasticizer to develop highly toughened and flexible polylactic acid films

Muhammad Arshad, Malik Hassan, Arturo Rodriguez-Urbe, Amar K. Mohanty* and Manjusri Misra*

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Dissolved oil and mercury(II) adsorption under dynamic conditions by thiol-terminated COF-modified sponges

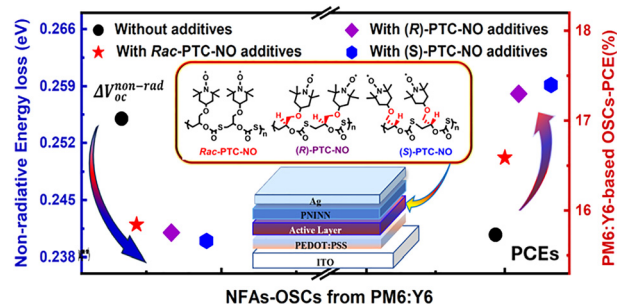
Panagiota Bika, Nadia Todorova, Theopisti Lymperopoulou, Lamprini-Areti Tsakanika, Maria-Anna Gatou, Elias Sakellis, Nikolaos Zacharopoulos, Vassilis Psycharis, Apostolos Kalafatis, Thomas Stergiopoulos, Dimitrios Tsoukleris, Evangelia A. Pavlatou and Panagiotis Dallas*



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Suppressing the non-radiative energy loss in non-fullerene-based organic solar cells *via* solid additives of racemic and isotactic nitroxide radical polymonothiocarbonates

Yuyan Tao, Xuanyu Zhou, Xiao Zheng, Huiyuan Peng, Min Gyu Kang, Pengzhi Guo, Xunchang Wang, Renqiang Yang, Ergang Wang, Hanyoung Woo and Yangjun Xia*

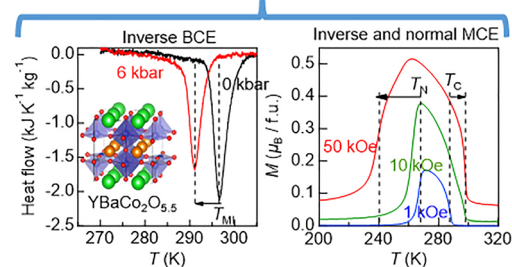


5116

Barocaloric and magnetocaloric effects in the A-site layer-ordered double perovskite $\text{YBaCo}_2\text{O}_{5.5}$

Mayuri Ito, Masato Goto,* Kevin Iputera and Yuichi Shimakawa*

Caloric effects by multiple external fields

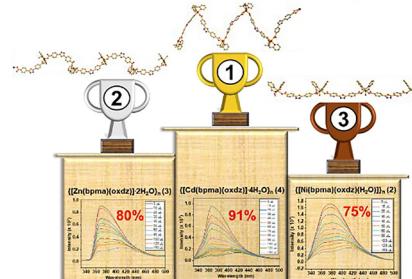


5123

Highly stable fluorescent coordination polymer materials for the ultrafast detection of nitrofurans in aqueous media at ppb levels

Alokananda Chanda and Sanjay K. Mandal*

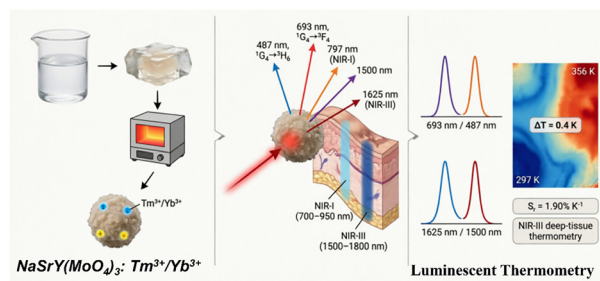
Luminescence-based detection of nitrofurans by helical 1D CPs



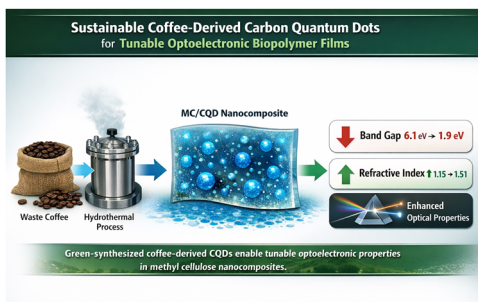
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Luminescent thermometry in $\text{NaSrY}(\text{MoO}_4)_3$: $\text{Tm}^{3+}/\text{Yb}^{3+}$: achieving high thermal sensitivities across the visible and near-infrared-I/III windows

Mariem Yanguï, Kamel Saidi,* Christian Hernández-Álvarez, Mohamed Dammak and I. R. Martín



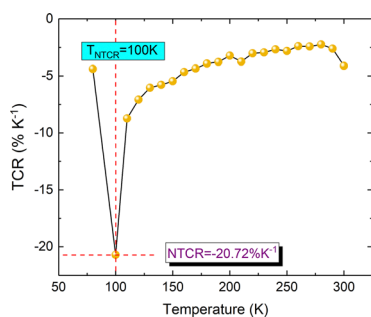
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Sustainable hydrothermal synthesis of ultrasmall carbon quantum dots from drinking coffee and their impact on optoelectronic properties of the methyl cellulose biopolymer

Hawkar A. Mohammed, Sulaiman Y. M. Alfaifi, Dara M. Aziz, Govar H. Hamasalih, Bakhet A. Alqurashy, Shujahadeen B. Aziz* and Sambasivam Sangaraju*

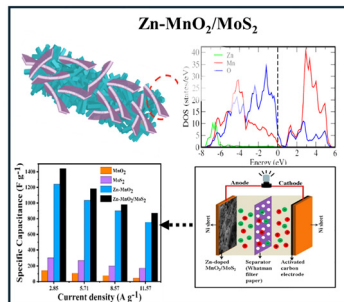
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Pr_{0.7}Ca_{0.3}Mn_{0.8}Cr_{0.2}O₃ as a promising candidate for sensor and thermistor applications: investigation of TCR, SF, β , and α parameters

R. Hanen, Y. Moulahi* and H. Rahmouni

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Unlocking high-energy and long-life supercapacitors via Zn–MnO₂/MoS₂ heterostructure engineering

Muhammad Shoaib Bilal, Muhammad Arslan, Saqib Javed, Amina Zafar, Atia Khalid, Shafqat Karim, Naeem Ahmad, Athar Javed, Abdul Ghaffar,* Amjad Nisar* and Mashkoor Ahmad*

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Boron-fused pyrazolyl zinc salen as a self-powered ultra-sensitive sensor for picomolar nicotine detection in realistic smoke environments

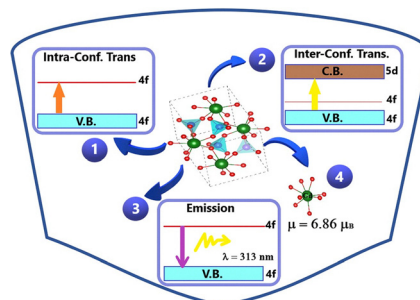
Sasmita Dhala, Prakash Nayak, Indrajit Mondal, Chinmaya Sahoo, Satyaprasad P. Senanayak* and Krishnan Venkatasubbaiah*



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Study of the structural, optical, and electronic properties of gadolinium orthophosphate: a combination of experimental and theoretical studies

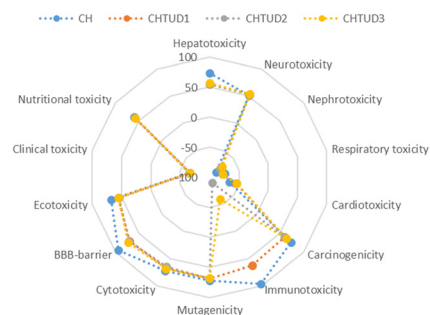
I. Abdelrhafor,* L. H. Omari,* M. Lassri, S. Tarik, A. El Hachmi, H. Lassri, E. K. Hlil and E. Dhahri



5215

Novel chitosan hybrid fluorinated thiourea derivatives as dual anti-microbial and anti-biofilm agents: tailoring molecular interactions, *in silico* toxicity, and docking simulation

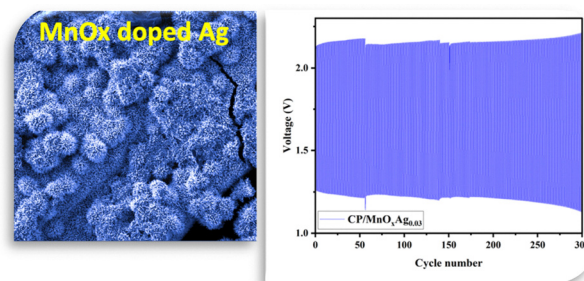
Moustafa S. Abusaif,* Ahmed Ragab,* Mohamed A. Salem, Nabila A. Maziad and Yousry A. Ammar



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Optimizing silver incorporation in MnO_x air cathodes to balance power density and cycling stability in rechargeable Zn–air batteries

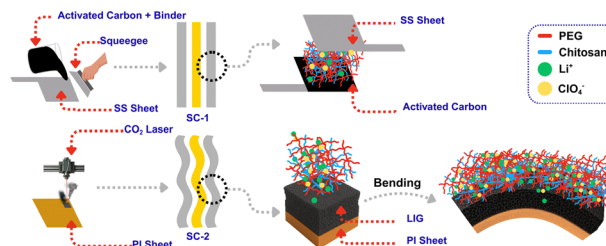
Saloua Merazga, Yahia Chelali, Fatahine Mohamed, Alonso Moreno Zuria and Mohamed Mohamedi*



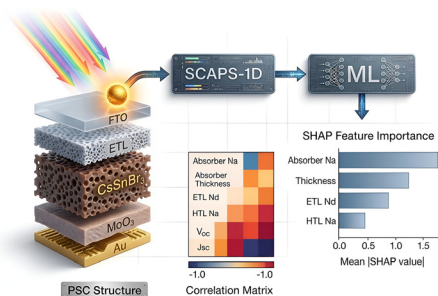
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Laser-induced graphene electrode and eco-friendly chitosan–poly(ethylene)glycol–LiClO₄ electrolytes for all-solid state flexible supercapacitors

Jadan Resnik Jaleel UC, Somashekara Bhat,* Y. N. Sudhakar and Vipin Cyriac



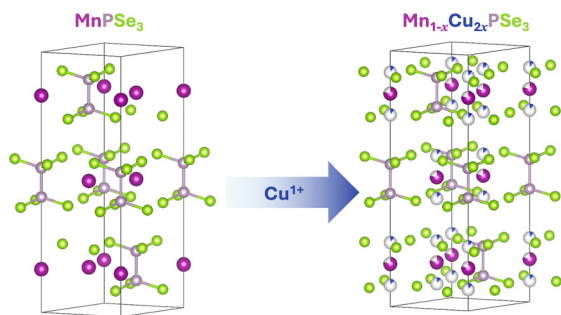
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Explainable machine learning-interpreted numerical analysis of CsSnBr₃ perovskite solar cells with diverse electron transport layers

M. Humayet Islam, Tanzir Ahamed,* Md. Shihab Uddin,* M. Jalal Uddin, M. M. Alam,* Md. Ali Hossain, Md Masum Billah, Md. Hasanuzzaman Dipu and Fernaz Narin Nur

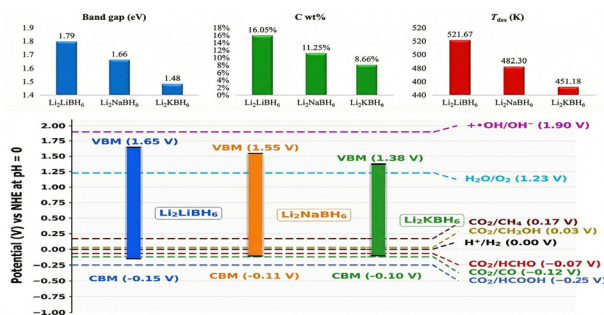
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Tuning magnetic order and spin–exciton interactions in MnPSe₃ via Cu substitution

Mohamed Nawwar, Alexander Blackston, Sogol Lotfi, Ziling Deng, Alexander Reifsnnyder, David McComb, Wolfgang Windl, Vicky Doan-Nguyen Trigg and Roberto C. Myers*

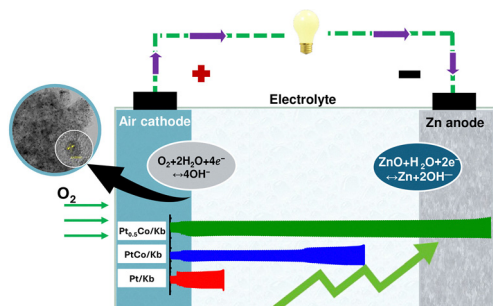
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DFT and AIMD predictions of Li₂XBH₆ (X = Li, Na, K) double perovskites for efficient hydrogen storage and photocatalytic applications

Partha Podder, Joy Kumar Sharkar, Md. Al-Amin, R. M. Tanvir, Siyam Sheikh, Md Tarikal Nasir, A. Rayhan and S. Mahmud*

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Integrating PtCo nanoparticles into graphitic carbon for rechargeable zinc–air batteries

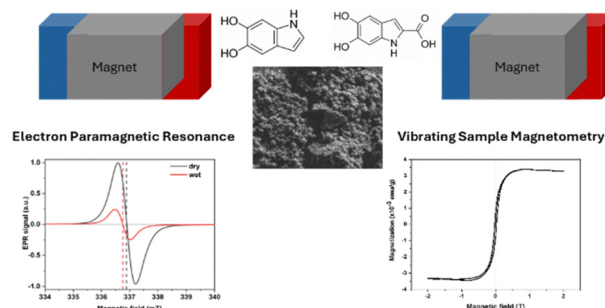
M. Jareer, Ana Maria Borges Honorato, Mohmmad Khalid, Mathew K. Francis, Safa Sanaz and Samaneh Shahgaldi*



5327

Spin dynamics and magnetization in Sepia melanin by electron paramagnetic resonance and vibrating sample magnetometry

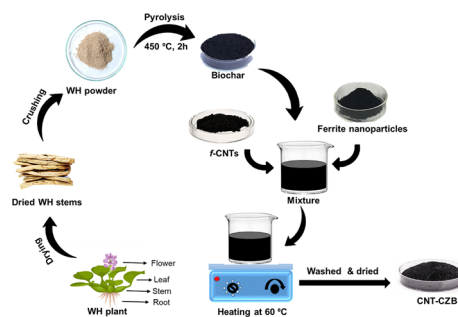
Shahid Khaleel, Christian Lacroix,* Darren Hall, Marjorie Cavarroc, David Ménard* and Clara Santato*



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Carbon nanotube incorporated magnetic biochar derived from water hyacinth for chromium removal from tannery effluent

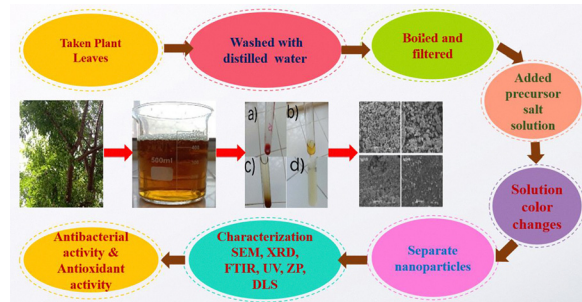
M. Hedayet Ullah and Mohammad Jellur Rahman*



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Role of metabolites in regulating size distribution, structural stability, morphology and biological performance of green-synthesized silver nanoparticles via *Celtis australis* extract

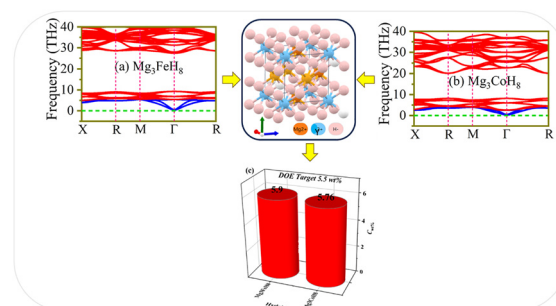
Salah Ud Din, Sharoz Waheed, Abdulhameed Khan, Jamoliddin Razzokov, Aziz Ibragimov and Sirajul Haq*



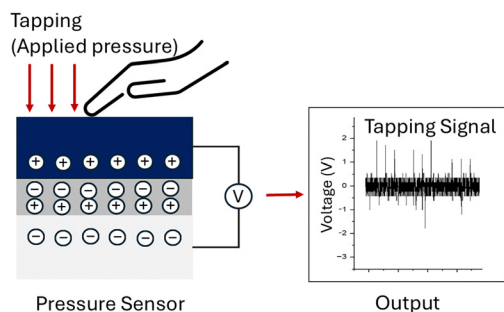
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Exploring structural, electronic, mechanical, and hydrogen storage properties of Mg_3ZH_8 (Z = Fe, Co): a density functional theory study

Md. Hasan Mia,* Md. Zahid Hasan, A. Arunkumar* and S. AlFaify



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Self-healing pseudo-piezoelectric pressure sensors from sustainable and recyclable materials

Cephas Amoah, Maria Jose Rojas Herrera, William Quentin Stroebel and W. G. Skene*

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Valorisation of bourbon distillery waste into single-source hybrid lithium-ion capacitors

Josiel Barrios Cossio, Juan Luis Gómez-Urbano, Sandesh Darlami-Magar, Rodney Andrews, Ignacio Martin-Gullon, Andrea Balducci and Marcelo I. Guzman*

