

# Materials Advances

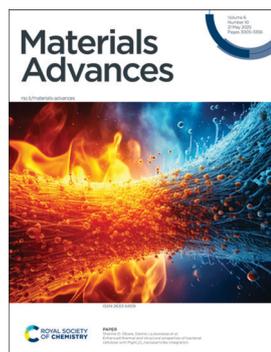
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### Cover

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### Inside cover

See Tae-Hyuk Kwon, Pooi See Lee *et al.*, pp. 3073–3083. Image reproduced by permission of Noah Al-Shamery from *Mater. Adv.*, 2025, 6, 3073.

## EDITORIAL

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### Introduction to structure–property relationships in alloys

Xiaoxiang Wu,\* Seok Su Sohn, Zhongji Sun and Qingqing Ding

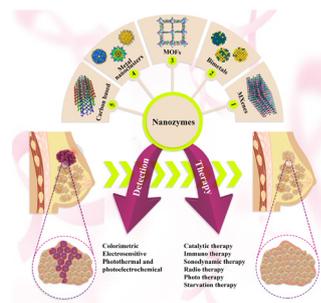


## REVIEWS

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### A comprehensive review on the recent applications of nanozymes in breast cancer therapy and diagnosis

Amir Kashtiaray, Mahdi Karimi, Mostafa Ghafari-Gorab and Ali Maleki\*



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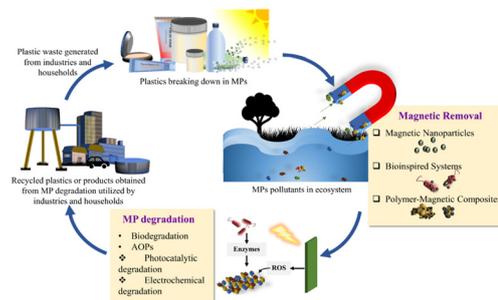
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## REVIEWS

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### Magnetic separation and degradation approaches for effective microplastic removal from aquatic and terrestrial environments

Akash Srivastava, G. L. Devnani and Priyanka Gupta\*

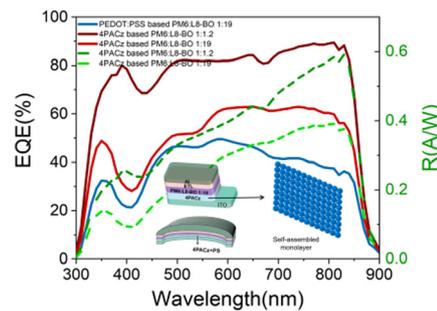


## COMMUNICATION

3058

### Efficient self-powered near-infrared organic photodetectors with a self-assembled transport layer

Jiazhen Cao, Xing Guo, Haimei Wu, Jingjing Chang and Qingzhen Bian\*

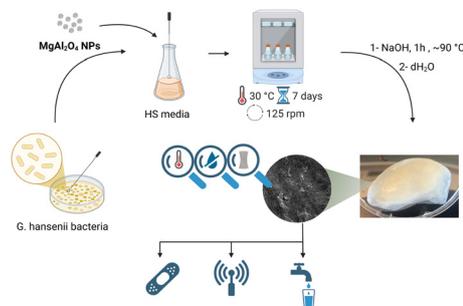


## PAPERS

3063

### Enhanced thermal and structural properties of bacterial cellulose with MgAl<sub>2</sub>O<sub>4</sub> nanoparticles integration

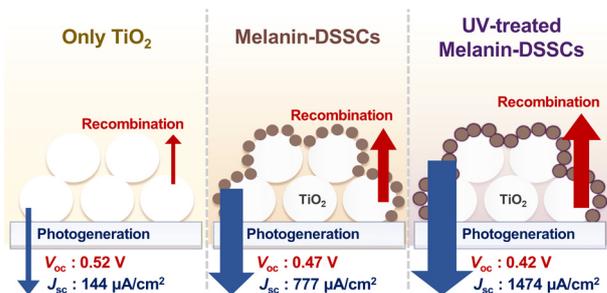
Abed Alqader Ibrahim, Anthony L. Dellinger, Jacob Coscarelly, Gayani Pathiraja, Sherine O. Obare\* and Dennis LaJeunesse\*



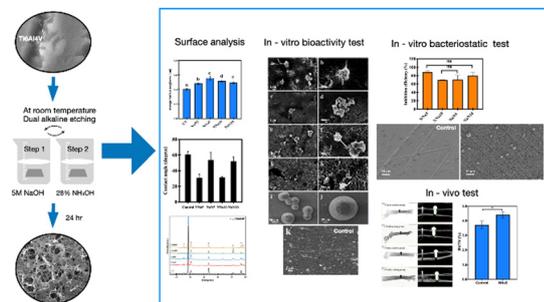
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### From black pigment to green energy: shedding light on melanin electrochemistry in dye-sensitized solar cells

Noah Al-Shamery, Jun-Hyeok Park, Seung Rok Kim, Florian Heppner, So Yeon Yoon, Thomas Bredow, Tae-Hyuk Kwon\* and Pooi See Lee\*



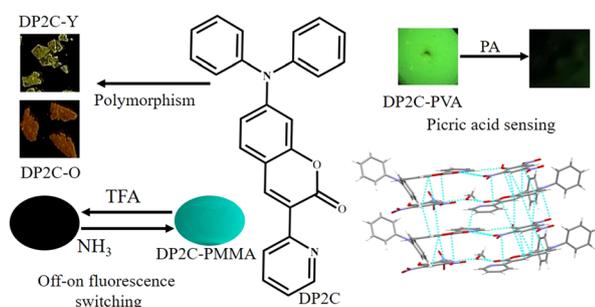
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### Dual alkali etching for osseointegration and reduced bacterial adhesion: a feasible alternative to SLA

Sushmita Chettri, Huasi Zhou, Wei Zhu, Håkan Engqvist, Deepa Seetharaman\* and Wei Xia\*

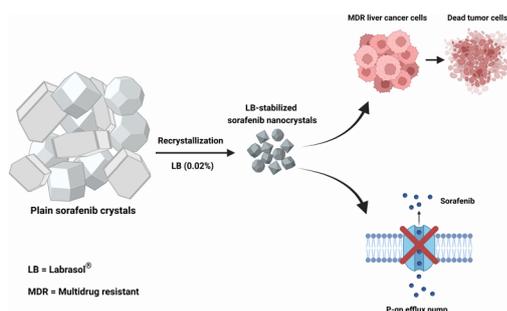
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### Dual-state emission triphenylamine-coumarin fluorescent polymorphs: halochromic reversible fluorescence switching and $\pi$ - $\pi$ stacking facilitated picric acid sensing

Sasikala Ravi, Subramanian Karthikeyan, Mehboobali Pannipara, Abdullah G. Al-Sehemi, Dohyun Moon\* and Savarimuthu Philip Anthony\*

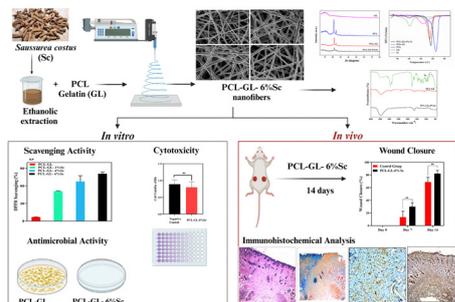
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### Sorafenib nanocrystals enhance bioavailability and overcome multidrug resistance in liver cancer cells: an approach based on P-gp inhibition strategy

Mohamed Nasr,\* Sameh Saber, Heba I. Elagamy, Soha M. El-Masry, Haydy Asad, Ahmed A. E. Mourad, Ahmed Gaafar Ahmed Gaafar and Shaimaa K. Mostafa

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### Promising wound healing activity of *Saussurea costus* loaded PCL-gelatin nanofibers

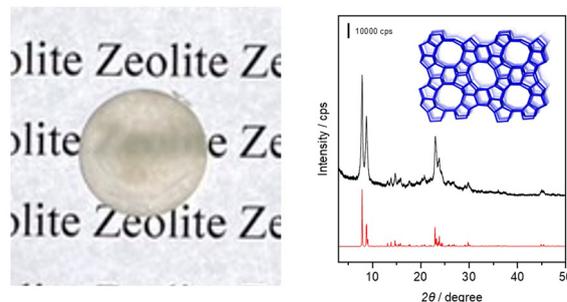
Jude Majed Lababidi, Mostafa Fytory, Abd Elrahman Abouzid, Jihad El-Qassas, Aya T. Gad, Osama M. Ahmed, Nagwa El-Badri\* and Hassan Mohamed El-Said Azzazy\*



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### Preparation of translucent silicalite-1 bulk ceramics by spark plasma sintering

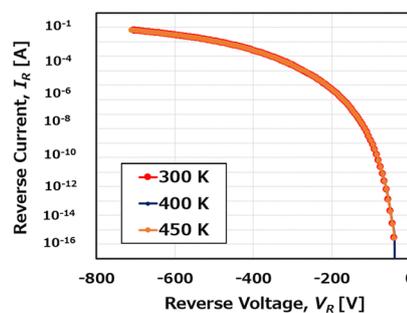
Masanori Takemoto, Yoshiaki Ito, Yuka Yoshihara, Shiori Odagiri, Yuta Shuseki, Kenta Iyoki, Tatsuya Okubo, Atsunobu Masuno and Toru Wakihara\*



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### Vertical p-GaN/n-Ga<sub>2</sub>O<sub>3</sub> heterojunction diode with high switching performance

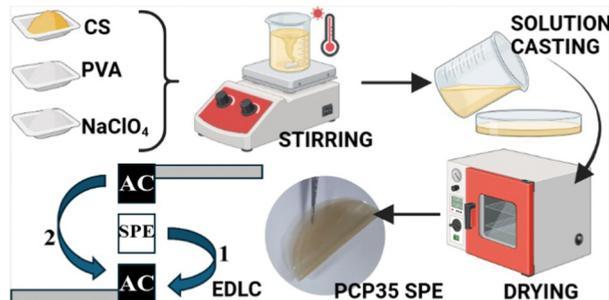
Phuc Hong Than,\* Tho Quang Than and Yasushi Takaki



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### Eco-friendly solid polymer electrolytes doped with NaClO<sub>4</sub> for next-generation energy storage devices: structural and electrochemical insights

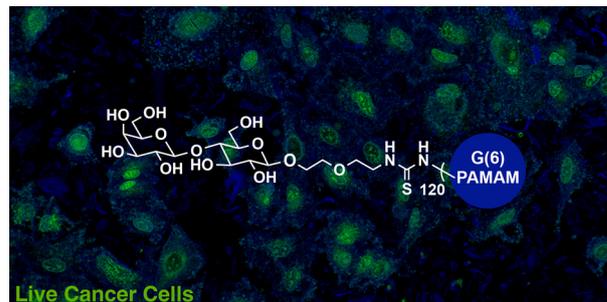
Vipin Cyriac, Ismayil,\* Kuldeep Mishra, Ankitha Rao, Riyadh Abdekadir Khellouf, Saraswati P. Masti and I. M. Noor



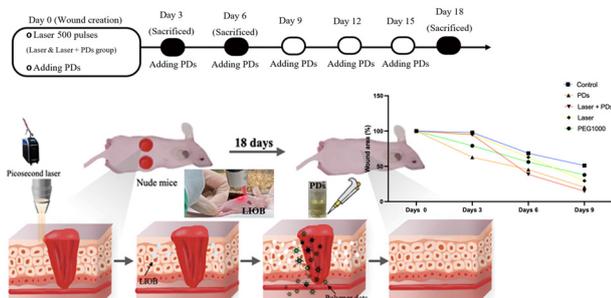
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### The toxicity, uptake, and impact on galectin-3 mediated apoptosis of lactose functionalized PAMAM dendrimers

Mackenzie S. Fricke, Magalee R. Frometa, Yannic Kerkhoff, Samuel P. Bernhard, Ramat S. Tahir, Elisa Quaas, William H. Totten, Rainer Haag, Katharina Achazi and Mary J. Cloninger\*



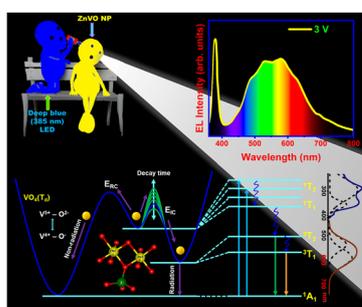
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### Bioactive hyperbranched polymer dot combined laser-induced optical breakdown for accelerating wound repair and regeneration in a nude mice model

Chang-Cheng Chang, Hoi-Man Iao, Siao-Cian Fan, Yi-Hsuan Tu, Jia-Chee Siew, Kang-Chiao Ma, Yu-Hsuan Lee, Hsiu-Mei Chiang, Ching-Chang Cheng and Tzong-Yuan Juang\*

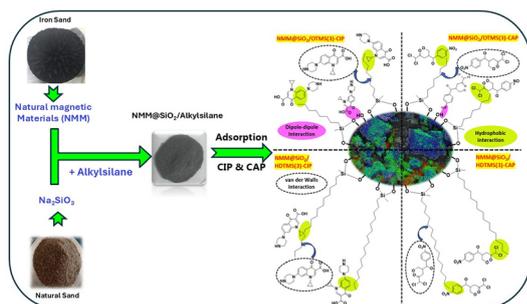
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### Fabrication and characterization of rare earth-free nanophosphor based devices for solid-state lighting applications

M. Rakshita, Aachal A. Sharma, Payal P. Pradhan, K. A. K. Durga Prasad, M. Srinivas and D. Haranath\*

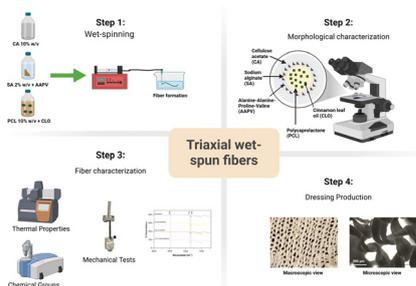
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### Effectiveness comparison of octyltrimethoxysilane and hexadecyltrimethoxysilane functionalized on natural silica-coated magnetic materials for ciprofloxacin and chloramphenicol adsorption

Johnson Nune Naat, Suyanta Suyanta and Nuryono Nuryono\*

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### Pioneering wound care solutions: triaxial wet-spun fibers with bioactive agents for chronic wounds – part I (production and characterization of the triaxial fibers)

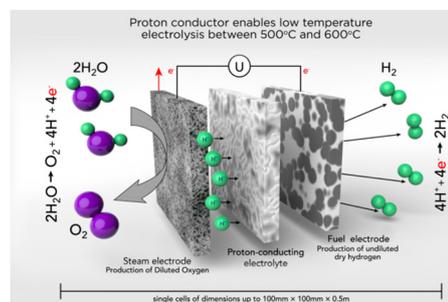
Catarina S. Miranda, Elina Marinho, Diana Rocha, Carla Silva, M. Manuela P. Silva, Inge Schlapp-Hackl, Wenwen Fang, Michael Hummel, Susana P. G. Costa, Natália C. Homem and Helena P. Felgueiras\*



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## Toward highly efficient protonic electrolysis cells for large-scale hydrogen production at moderate temperatures

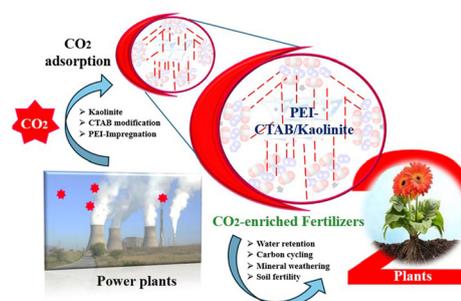
Leonard Kwati,\* Kuninori Miyazaki, Christian Dellen, Mariya E. Ivanova, Wendelin Deibert, Julia Wolter, Wilhelm A. Meulenber, Olivier Guillon, Veeramani Vedyappan, Tatsumi Ishihara and Hiroshige Matsumoto



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## Environmental materials: CO<sub>2</sub>-adsorbing clays for enhancing soil fertility and agricultural sustainability

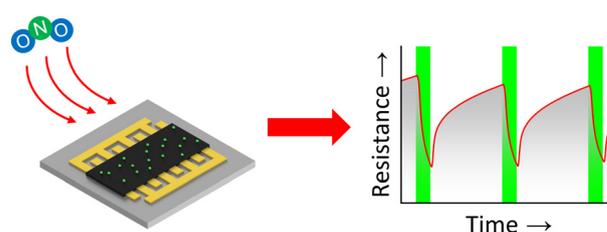
Faizah Altaf, Shakeel Ahmed, Shahid Ali, Muhammad Mansha and Safyan Akram Khan\*



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## Black gold layers: preparation *via* thermal evaporation, material and optical properties, and application potential for gas sensors

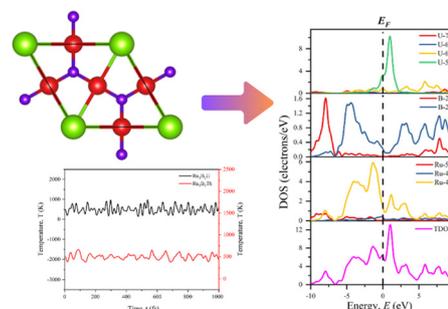
Jan Kejzlar,\* Joris More-Chevalier, Martin Hruška, Jaroslav Otta, Přemysl Fitl, Michal Novotný, Morgane Poupon, Petr Hruška, Dejan Prokop, Stanislav Cichoň, Ladislav Fekete, Veronica Goian, Stanislav Kamba, Jakub Čížek, Maik Butterling, Maciej Oskar Liedke, Eric Hirschmann, Andreas Wagner, Martin Vrnáta and Ján Lančok



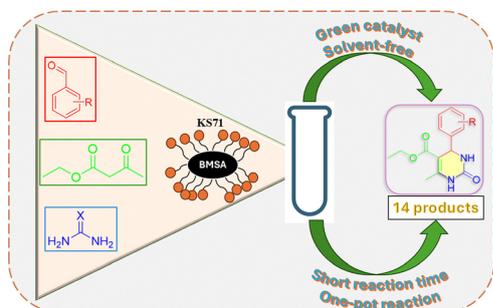
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## First-principles study of the ground-state properties of ternary borides with the Ru<sub>3</sub>B<sub>2</sub>X (X = Th, U) type structure: a comparative analysis

Md. Raihan Islam, Prianka Mondal and Arpon Chakraborty\*



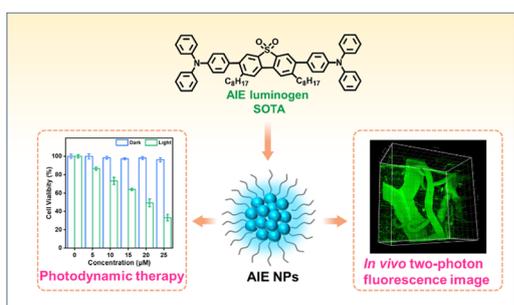
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Application of magnetic materials bearing Brønsted acid sites – based on the modification of amorphous carbon with ionic liquids as catalysts for synthesis of dihydropyrimidinone derivatives *via* the Biginelli reaction

Thai-Phien Huynh Dang, Thach Ngoc Pham, Phuong Hoang Tran and Hai Truong Nguyen\*

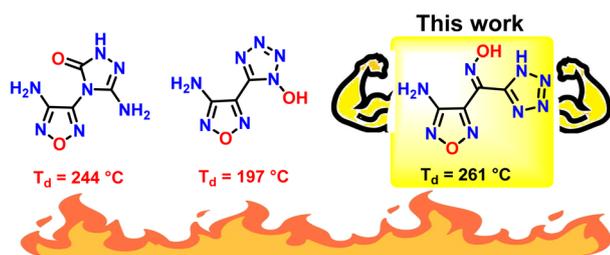
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An AIE-active fluorophore based dibenzothiophene-*S,S*-dioxide unit for highly efficient fluorescence imaging and photodynamic therapy

Liwen Hu, Tianze Hu, Ting Guo\* and Chunxiao Wang\*

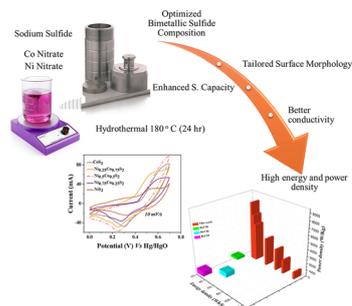
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Strategies for balancing safety in oxadiazole tetrazole derivatives: the role of the oxime group

Parul Saini, Jatinder Singh, Vikranth Thaltiri, Richard J. Staples and Jeanne M. Shreeve\*

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Strategic design of binary transition metal sulfides for superior asymmetric supercapacitors

Junaid Khan,\* A. Ahmed and Abdullah A. Al-Kahtani

