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IN THIS ISSUE

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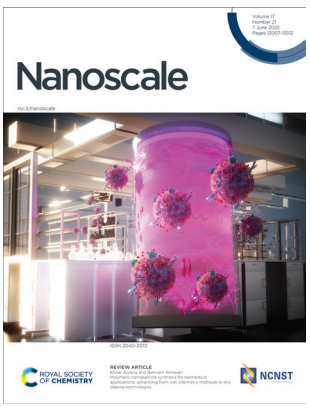

Cover
See Elmer Austria and Behnam Akhavan, pp. 13020–13056.

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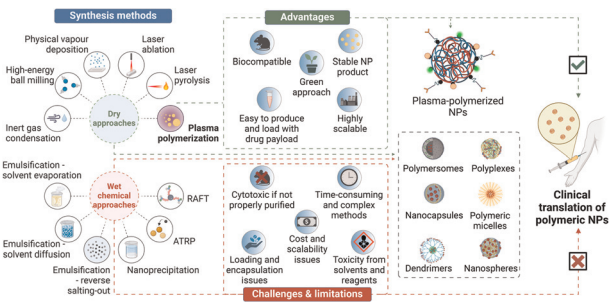
REVIEWS

13020

Polymeric nanoparticle synthesis for biomedical applications: advancing from wet chemistry methods to dry plasma technologies

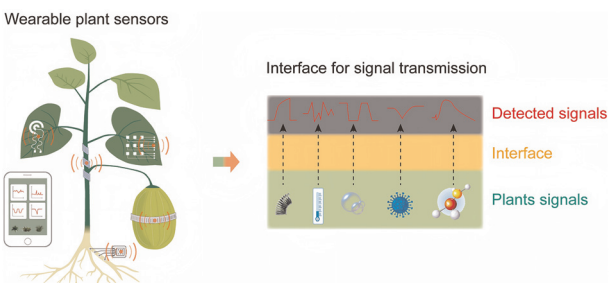
Elmer S. Austria, Jr. and Behnam Akhavan*



13057

Inspiration of plant-related adhesion for plant wearable sensor interface design

Peicheng Teng,* Yinmin Cai, Xinxin Liu, Yulu Tuo, Shihao Wu, Qiannian Wang, Yiheng Li, Feilong Zhang* and Shutao Wang



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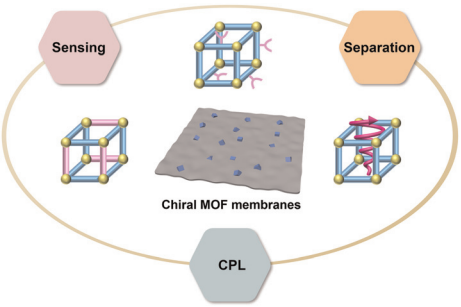
REVIEWS

13076

Emerging frontiers in chiral metal–organic framework membranes: diverse synthesis techniques and applications

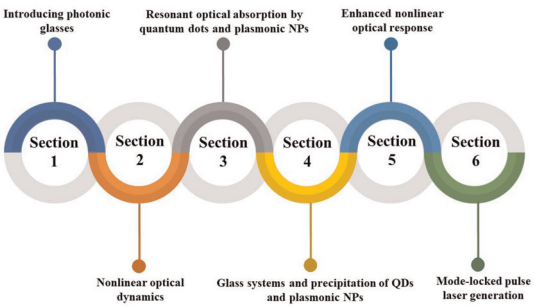
Yun Fan and Mengyun Chen*



13094

Nonlinear photonics in glass systems doped with quantum dots and plasmonic nanoparticles

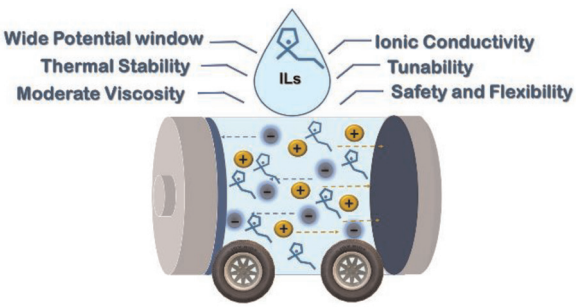
Muhammad Aamir Iqbal, Jianrong Qiu and Xiaofeng Liu*



13121

Challenges, opportunities, and roadmap for ionic liquid-based electrolytes in advancing energy storage devices

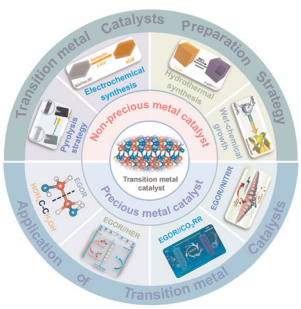
Sudeshna Chaudhari, Poulomi Nandi and Chandramouli Subramaniam*



13145

Research progress of transition metal catalysts for electrocatalytic EG oxidation

Hongjing Wu, Xiaoyue Zheng, Jiajia Liu, Yanru Yuan, Yuquan Yang, Chenjing Wang, Li Zhou, Lulu Wang, Binbin Jia,* Xiaoyu Fan* and Jinlong Zheng*



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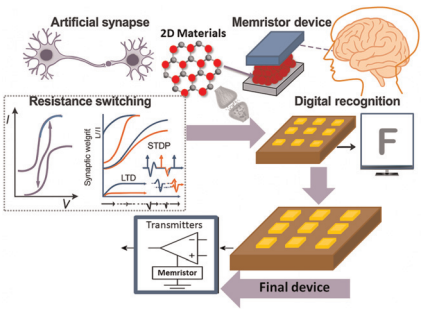

2D $MoTe_2$ memristors for energy-efficient artificial synapses and neuromorphic applications

Rajwali Khan,* Naveed Ur Rehman, Sujith Kalluri, Sundaravadivel Elumalai, Appukuttan Saritha, Muhammad Fakhar-e-alam, Muhammad Ikram, Sherzod Abdullaev, Nasir Rahman and Sambasivam Sangaraju*

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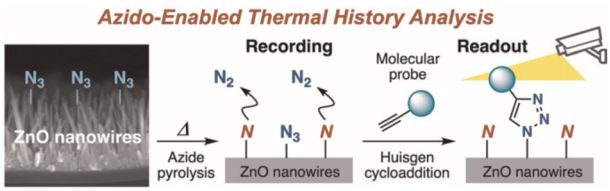
13207

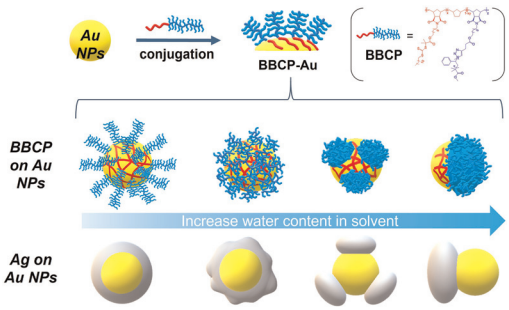


Azido-enabled thermal history analysis on a metal–oxide surface

Satoki Yamaguchi, Tomohiro Iwai,* Hiromichi V. Miyagishi, Hiroshi Masai, Takuro Hosomi, Takeshi Yanagida, Ken Uchida and Jun Terao*

PAPERS

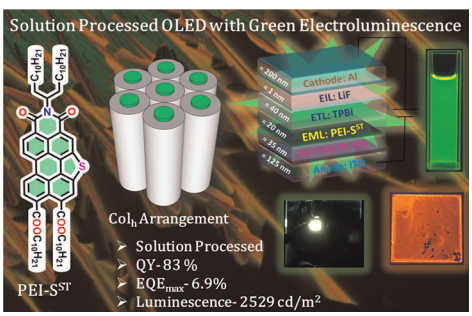
13212



Bottlebrush polymer patches template heterometal growth on a gold nanoparticle surface

Minjun Kim, Jiyun Nam, Jiseok Kim, Hyunsik Hwang, Myungeun Seo* and Hyunjoon Song*

13219



Unsymmetrical *S*-annulated perylene diester imide, stabilizing room temperature columnar phase as a dopant for greenish-yellow OLEDs with an outstanding EQE of 6.9%

Paresh Kumar Behera, Sushanta Lenka, Feng-Rong Chen, Mrinmoy Roy, Lu Chun-Chang, Chang-Hua Liu, Jwo-Huei Jou* and Ammathnadu Sudhakar Achalkumar*

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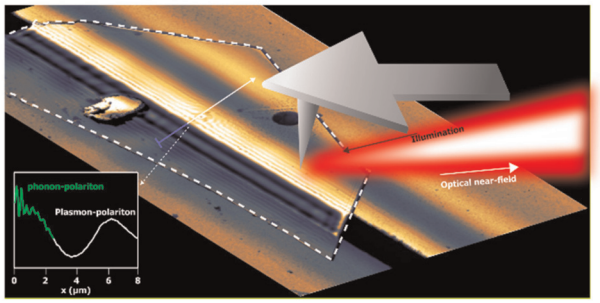
13229

Nanophotonics of mid-infrared plasmon-polaritons at interfaces between metals and two-dimensional crystals

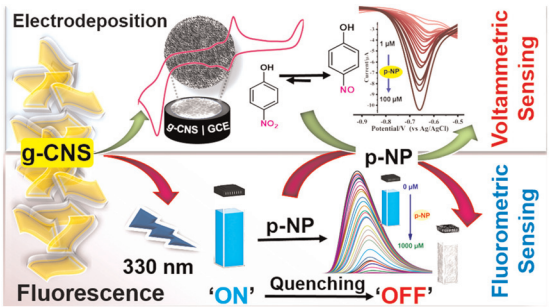
Flávio H. Feres,* Ingrid D. Barcelos, Dario A. Bahamon, João E. Levandoski, Andrea Mancini, Thiago M. dos Santos, Rafael A. Mayer, Davi H. S. Camargo, Carlos C. B. Bufon, Adrian Cernescu, Stefan A. Maier, Raul de O. Freitas and Francisco C. B. Maia*



13238

Metal-free graphitic carbon nitride nanosheet for dual mode fluorescence and electrochemical detection of *para*-nitrophenol

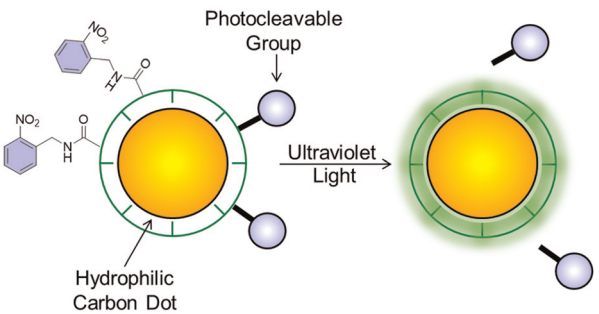
Ankush Kumar Singh, Aayoosh Singh, Mithilesh Patel, Vinod P. Singh and Rosy*



13251

Photoinduced luminescence activation of hydrophilic 'caged' carbons dots

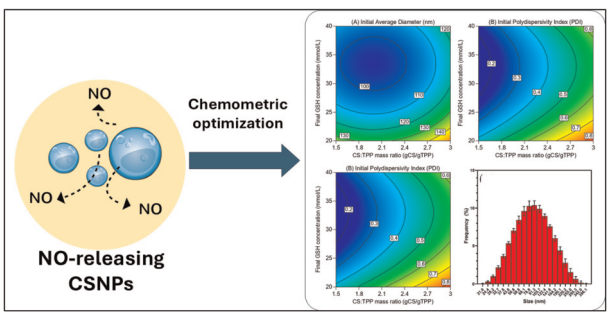
Aviya S. Akari, Maria R. Narciso, Emmanuel O. Fagbohun, Pedro D. Ortiz, Roberto J. Botelho and Stefania Impellizzeri*



13258

Multivariate chemometric design of nitric oxide-releasing chitosan nanoparticles for skin-related biomedical applications

Renan S. Nunes,* Victor D. P. Cinel, Joana C. Pieretti, Kelli C. F. Mariano, Roberta A. dos Reis, Morgana Halfeld and Amedea B. Seabra*



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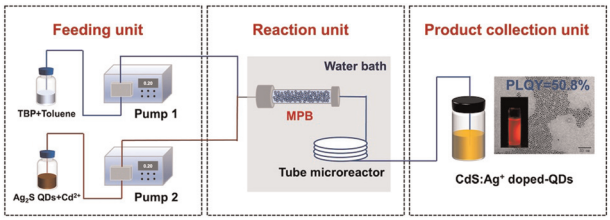
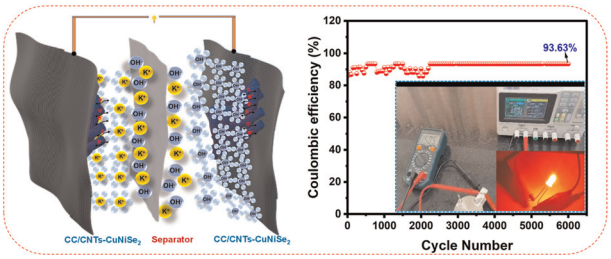


A MPB-intensified tube microreactor system for continuous synthesis of Ag^+ doped CdS quantum dots

Chuwei Zhu, Yuxi Li, Tailei Hou, Xiaole Gu, Xinyuan Li,* Le Sang* and Jiatao Zhang*

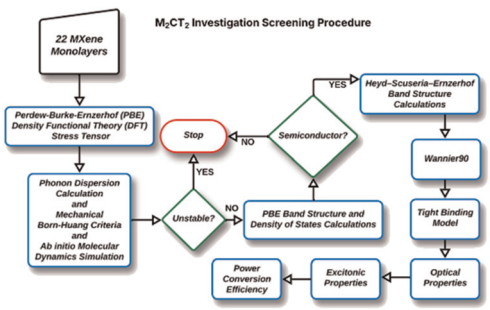
13283



In situ synthesis of bimetallic chalcogenides with highly conductive carbon nanotubes for efficient symmetric hybrid supercapacitors

Soumyajit Jana, Sampath Karingula, Anjana Sajeevan, Phani Kumar V. V. N. and Yugender Goud Kotagiri*

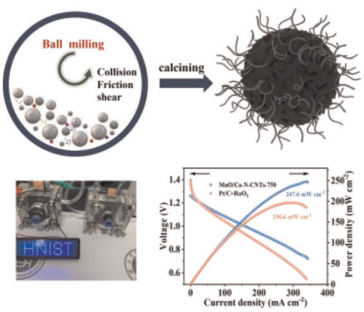
13298



Enhanced solar harvesting efficiency in nanostructured MXene monolayers based on scandium and yttrium

Bill D. Aparicio-Huacarpuma, Marcelo L. Pereira, Jr,* Mauricio J. Piotrowski, Celso R. C. Rêgo, Diego Guedes-Sobrinho, Luiz A. Ribeiro, Jr and Alexandre C. Dias

13311



Interwoven MnO/Co-derived N-doped carbon nanotube composites as highly efficient and durable bifunctional oxygen catalysts for zinc–air batteries

Yun Yang, Qing Long, Wei Wang,* Junlin Huang,* Yufei Zhao, Hao Liu and Hong Gao*

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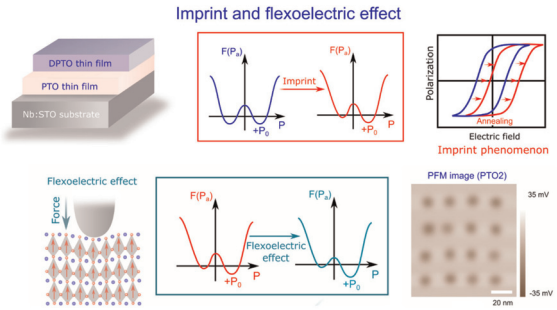
13324

Local ferroelectric domain switching phenomenon in $PbTiO_3$ thin films affected by the imprint effect and external force

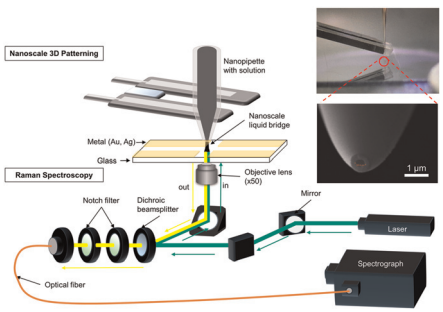
Eunmi Lee and Jong Yeog Son*



13333

Atomic force microscope-guided nanoscale 3D patterning for carbon nanofibers with *in situ* Raman spectroscopy

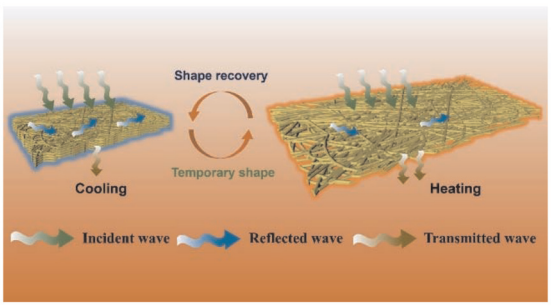
Yeonju Bae, Hojin Jang, Taesun Yun, Chanuk Yang, Jonggeun Hwang, Minji Park, Sanghan Lee, Jangyup Son,* Kyoung-Duck Park,* Jongwoo Kim,* Wonho Jhe* and Sangmin An*



13344

Shape memory composite membrane with widely programmable electromagnetic shielding effectiveness

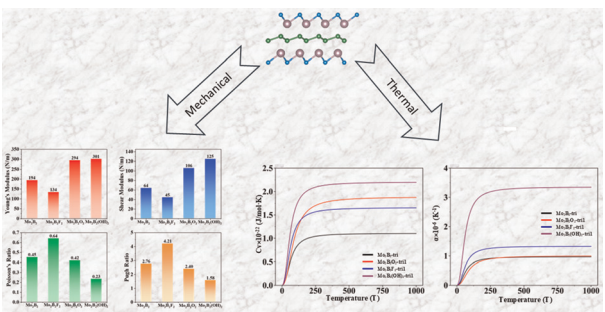
Zhiyong Zeng, Jv Li, Chuanru Zheng, Hongmei Chen, Gang Liu, Jian Huang, Kun Qian, Fenghua Zhang and Wenbing Li*



13357

Superior mechanical and thermal properties of oxygen terminated trigonal Mo_2B_2 MBenes

Di Zhao, Mengqing Hu, Ming Zhou, Mingli Li, Oscar Allen, Irfan Ali Soomro, Samuel Akinlolu Ogunkunle, Lei Zhang, Liang Wang, Zhenzhen Wu, Porun Liu, Yuan Mei and Yun Wang*



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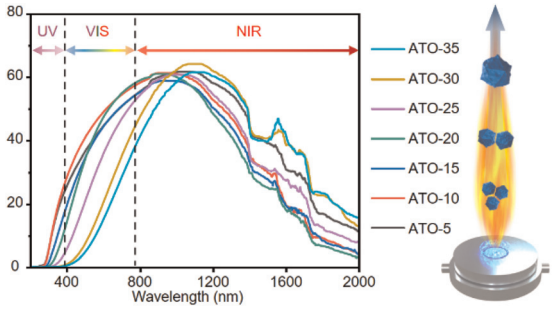
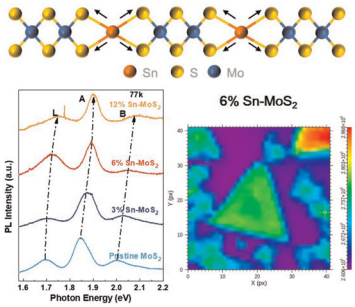


Tailored nanoscale structure of flame-made antimony doped tin oxides and their near-infrared shielding properties

Tung Van Pham, Tomoyuki Hirano,* Eishi Tanabe, Eka Lutfi Septiani, Kiet Le Anh Cao and Takashi Ogi

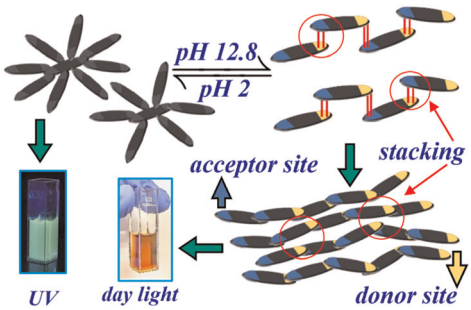
13378



CVD synthesis and optical study of bandgap-tunable Sn-doped monolayer molybdenum disulfide

Yuxin Zhang, Zhengbo Zhong, Yuhao Mi, Jiawei Duan, Sheng Han,* Tianhui Ren* and Zhipeng Li*

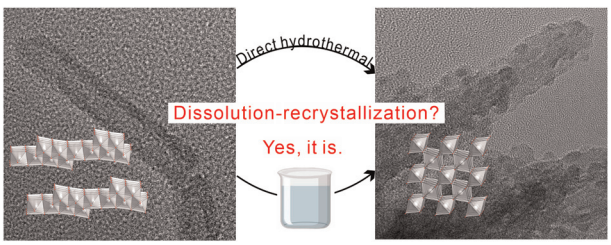
13387



Multi-emissive graphene oxide quantum dots with remarkable pH-responsive long-wavelength emission

Indrani Chakraborti, Udayan Basak, Subhadip Roy, Mahuya Pakhira, Arindam Das and Dhruba P. Chatterjee*

13403



Revisiting the dissolution-recrystallization mechanism of rutile growth from protonated titanate nanotubes

Yanxin Chen, Fan Wu, Lijing Fan, Shaohua Chen, Jieyi Shen and Pengxin Liu*

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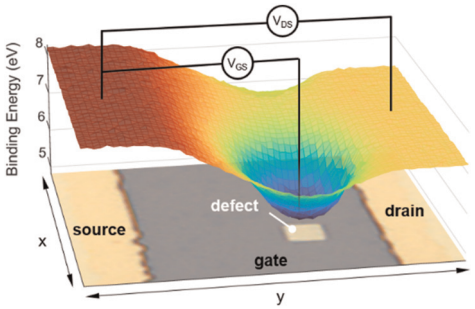
13410

Operando observation of gate defects in quantum dot-based field effect transistors

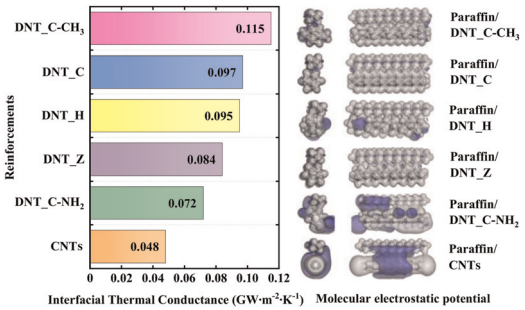
Mariarosa Cavallo, Dario Mastrippolito, Erwan Bossavit, Clement Gureghian, Albin Colle, Tommaso Gemo, Adrien Khalili, Huichen Zhang, Yoann Prado, Erwan Dandeu, Sandrine Ithurria, Pavel Dudin, José Avila, Debora Pierucci and Emmanuel Lhuillier*



13419

Enhanced interfacial thermal transport in diamond nanothread reinforced polymer nanocomposites: insights from atomistic simulations and density functional theory

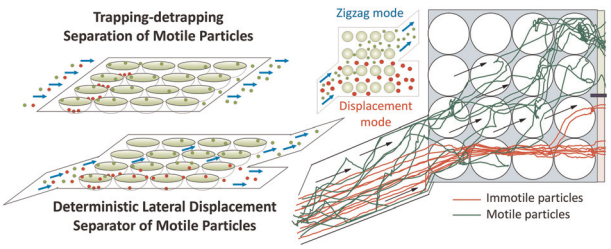
Xuefeng Liu, Rui Yang, Zhiwu Bie, Fenghua Nie,* Yong Fan, Erkan Oterkus and Xiaoqiao He



13434

Motility-dependent selective transport of active matter in trap arrays: separation methods based on trapping-detrapping and deterministic lateral displacement

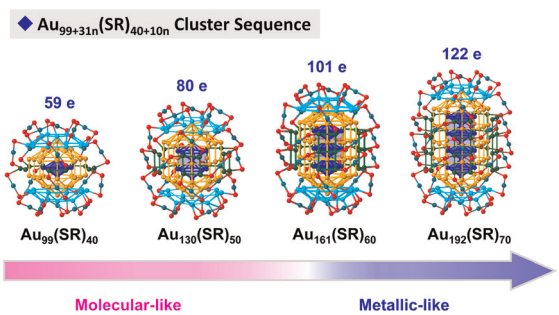
Vyacheslav R. Misko,* Franco Nori and Wim De Malsche



13447

Theoretical study on a novel $Au_{99+31n}(SR)_{40+10n}$ cluster sequence with D_5 symmetry

Youqiong Fang and Lin Xiong*



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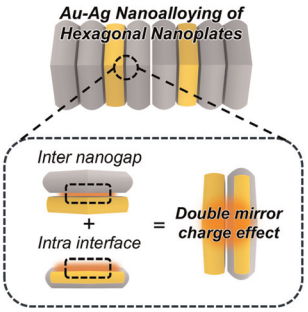
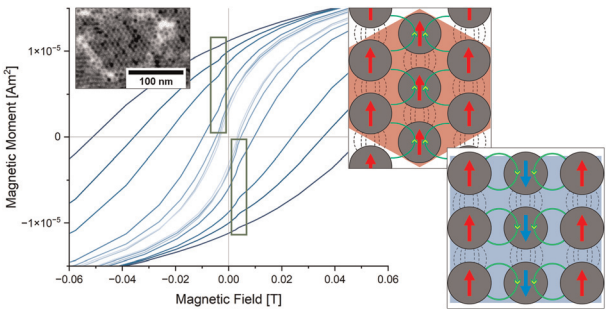


Au–Ag controllable composition nanoalloying of hexagonal nanoplates: heterogeneous interfacial nanogaps enhance near-field focusing

Sungbeen Park, Insub Jung, Soohyun Lee, Qiang Zhao, Sungwoo Lee, Hyunji Kim and Sungho Park*

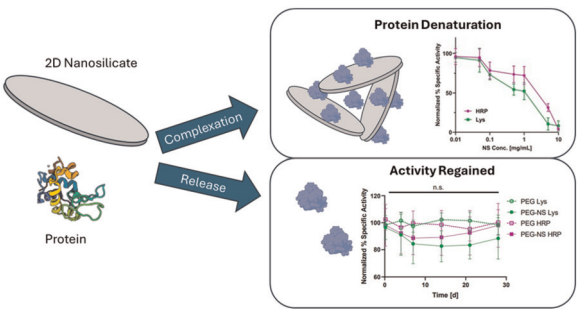
13466



The role of superlattice phases and interparticle distance in the magnetic behaviour of SPION thin films

Marion Görke, Sherif Okeil, Guohui Yang, Hermann Nirschl, Thilo Viereck and Georg Garnweitner*

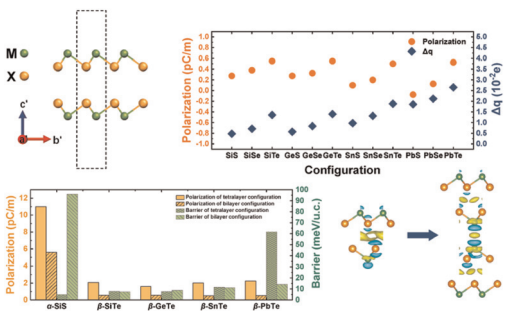
13477



Protein structure and bioactivity upon adsorption and desorption from nanosilicate sustained release delivery devices

Samuel Stealey, Ether Dharmesh, Akhilesh K. Gaharwar, Jai S. Rudra and Silviya P. Zustiak*

13489



Sliding ferroelectricity in bilayer phosphorus analogue compounds: mechanisms and applications

Dong-Dong Wang, Xin-Yi Gao, Yan-Dong Guo,* Yu-Ting Guo, Zhi-Peng Huan, Li-Yan Lin, Yue Jiang,* Zeng-Yun Gu, Hong-Li Zeng* and Xiao-Hong Yan

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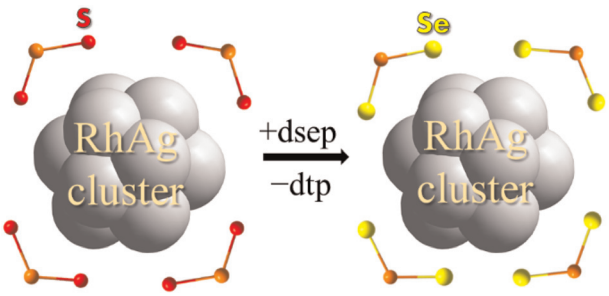
13502

Rhodium–silver superatomic nanoclusters stabilized by diselenophosphate ligands

Tzu-Hao Chiu, Michael N. Pillay, Samia Kahlal, Jean-Yves Saillard* and C. W. Liu*



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