

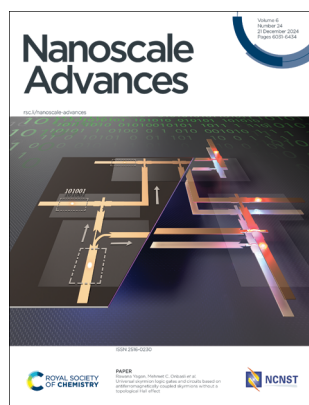
Nanoscale Advances

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 6(24) 6031–6434 (2024)



Cover

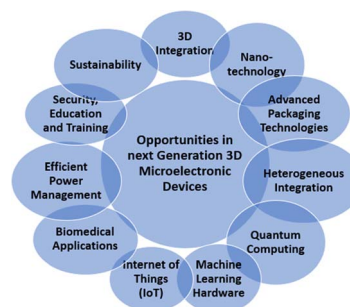
See Rawana Yagan, Mehmet C. Onbasli *et al.*, pp. 6142–6153. Image reproduced by permission of Mehmet Cengiz Onbaşlı from *Nanoscale Adv.*, 2024, 6, 6142.

REVIEWS

6044

Challenges and opportunities in engineering next-generation 3D microelectronic devices: improved performance and higher integration density

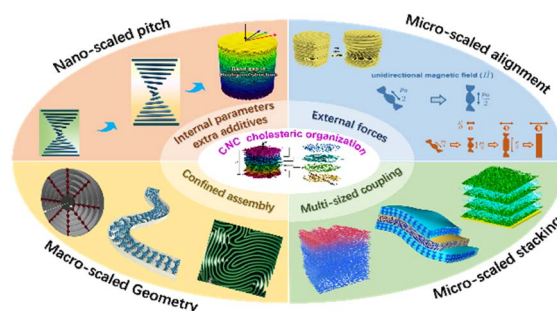
Niharika Singh, Kingshuk Srivastava,* Ajay Kumar, Neha Yadav, Ashish Yadav,* Santosh Dubey, Rajesh Singh, Anita Gehlot, Ajay Singh Verma, Neha Gupta, Tanuj Kumar, Yongling Wu, Zheng Hongyu, Aniruddha Mondal, Kailash Pandey, Ranjeet Brajpuriya, Shalendra Kumar and Rajeev Gupta*



6061

Multi-scaled regulation for cholesteric organization of cellulose nanocrystals based on internal and external factors

Baiqi Song, Richu Luo, Haixing Jiao, Fangling Li, Juan Yu* and Xiaofang Zhang*



ChemComm

Uncover new possibilities
with outstanding
preliminary research

Original discoveries, fuelling
every step of scientific progress

rsc.li/chemcomm

Fundamental questions
Elemental answers

COMMUNICATIONS

6129



Spaghetti
~2 mm

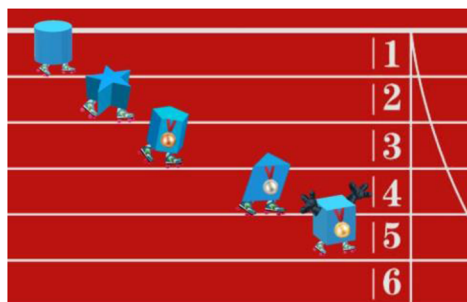
Capelli d'Angello
~900 μm

Nanopasta
~370 nm

Nanopasta: electrospinning nanofibers of white flour

Beatrice Britton, Fangyuan Zhang, David B. Anthony, Ceasar III D. L. Reyes, Michal Pawlus, Gareth R. Williams* and Adam J. Clancy*

6134

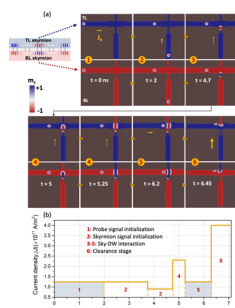


Shape-controlled movement of Zn/SU-8 micromotors

Tijana Maric,* Lasse Højlund Eklund Thamdrup and Anja Boisen

PAPERS

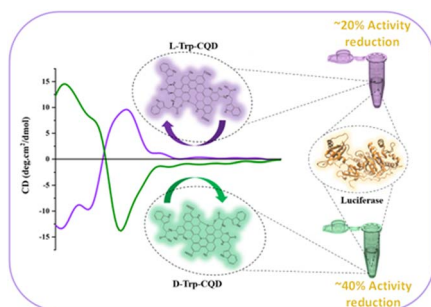
6142



Universal skyrmion logic gates and circuits based on antiferromagnetically coupled skyrmions without a topological Hall effect

Rawana Yagan,* Arash Mousavi Cheghabouri and Mehmet C. Onbasli*

6154



Chirality governs the structure and activity changes of *Photinus pyralis* firefly luciferase induced by carbon quantum dots

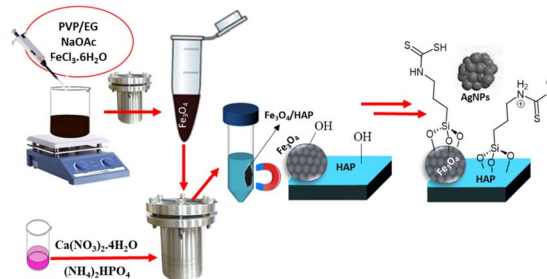
Mehrnaz Rad-Faraji, Marziyeh Mousazadeh, Maryam Nikkhah,* Sajad Moradi, Mohabbat Ansari, Klara Cepe, Saman Hosseinkhani and Aram Rezaei*



6166

Bactericidal behavior of silver nanoparticle decorated nano-sized magnetic hydroxyapatite

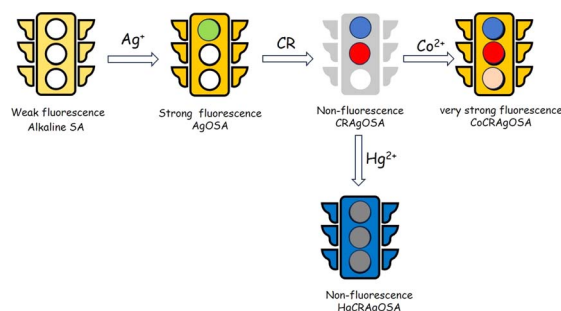
Ebrahim Sadeghi, Reza Taghavi, Amir Hasanzadeh* and Sadegh Rostamnia*



6173

Simultaneous ionic cobalt sensing and toxic Congo red dye removal: a circular economic approach involving silver-enhanced fluorescence

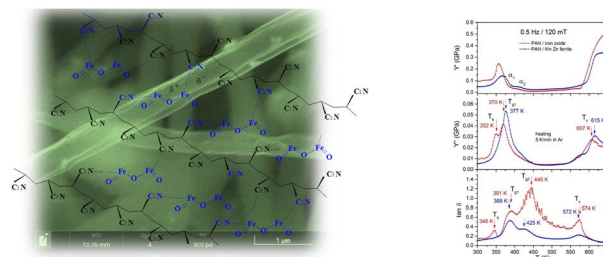
Mamta Sahu, Mainak Ganguly,* Priyanka Sharma, Ankita Doi and Yuichi Negishi



6184

Thermomechanical properties of confined magnetic nanoparticles in electrospun polyacrylonitrile nanofiber matrix exposed to a magnetic environment: structure, morphology, and stabilization (cyclization)

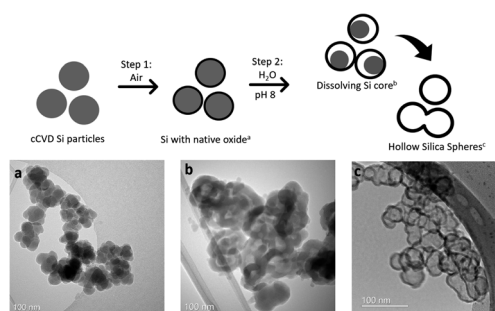
Baran Sarac, Viktor Soprunyuk, Gordon Herwig, Selin Gümrükçü, Ekrem Kaplan, Eray Yüce, Wilfried Schranz,* Jürgen Eckert, Luciano F. Boesel and A. Sezai Sarac*



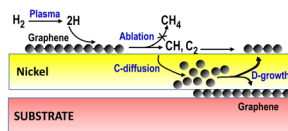
6196

From silicon to silica: a green chemistry approach for hollow sphere nanoparticle formation

Hennie Marie Johnsen,* Anuj Pokle, Werner Filtvedt, Marianne Hiorth, Jo Klaveness and Anja Olafsen Sjøstad



6205

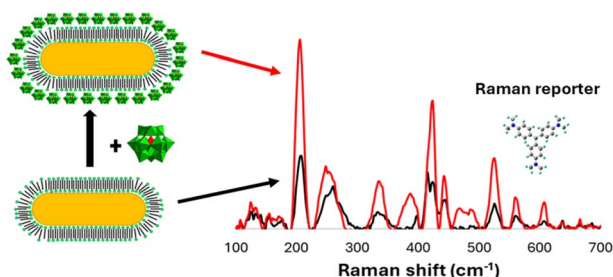


Hydrogen radicals promote Carbon diffusion through Nickel film and Graphene growth on the substrate surface

Direct localized growth of graphene on a substrate: a novel nickel-catalyzed CVD process assisted by H₂ plasma

Giuseppe Valerio Bianco,* Zhuohui Chen and Giovanni Bruno

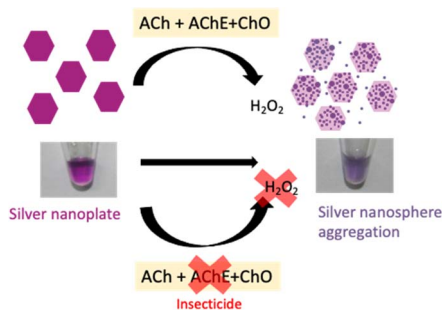
6211



Self-assembly of hard anions around cationic gold nanorods: potential structures for SERS

Offer Zeiri,* Katherine M. Hatzis, Maurea Gomez, Emily A. Cook, Maegen Kincanon and Catherine J. Murphy*

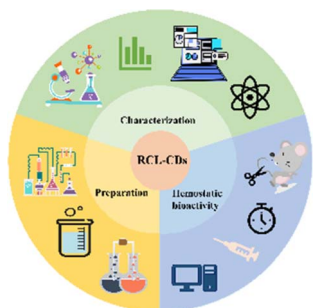
6221



Bi-enzyme assay coupled with silver nanoplate transformation for insecticide detection

Thitikan Khampieng, Kaneenard Kewcharoen, Tewarak Parnklang, Sumana Kladsomboon, Orawon Chailapakul and Amara Apilux*

6229



Hemostatic bioactivity and mechanism of novel *Rubia cordifolia* L.-derived carbon dots

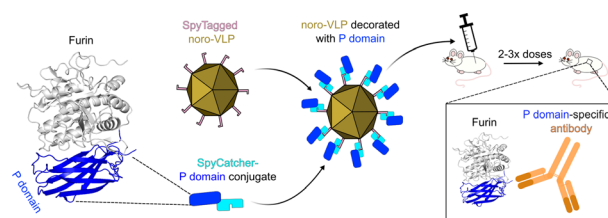
Zhaojiong Zhang, Wenjing Hu, Aiqi Yu, Haixue Kuang and Meng Wang*



6239

Experimental VLP vaccine displaying a furin antigen elicits production of autoantibodies and is well tolerated in mice

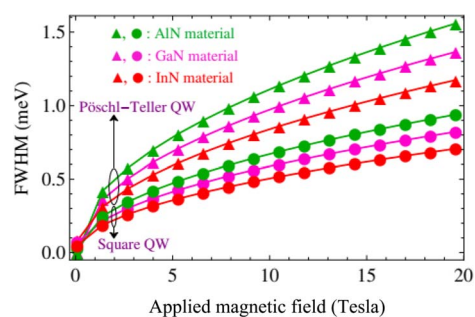
Vili Lampinen, Markus J. T. Ojanen, Fernanda Muñoz Caro, Stina Gröhn, Minna M. Hankaniemi, Marko Pesu and Vesa P. Hytönen*



6253

Optical, magnetic, and transport properties of two-dimensional III-nitride semiconductors (AlN, GaN, and InN) due to acoustic phonon scattering

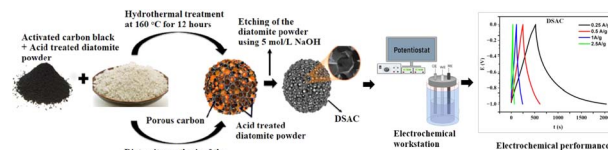
Ho Kim Dan, Pham Tuan Vinh and Nguyen Dinh Hien*



6265

Tailoring a hierarchical porous carbon electrode from carbon black via 3D diatomite morphology control for enhanced electrochemical performance

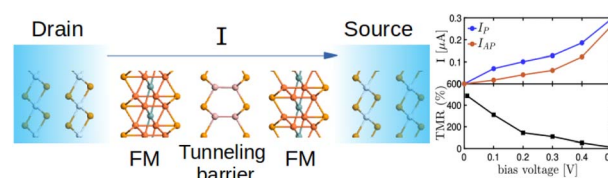
Eugene Sefa Appiah,* Kwadwo Mensah-Darkwa,* Anthony Andrews, Frank Ofori Agyemang, Martinson Addo Nartey, Katlego Makgopa, Yongdan Hou,* Patrick Aggrey and David Ato Quansah



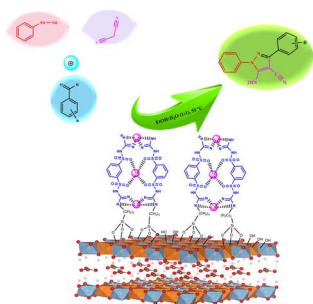
6278

Efficient spin filtering through Fe₄GeTe₂-based van der Waals heterostructures

Masoumeh Davoudiniya and Biplab Sanyal*



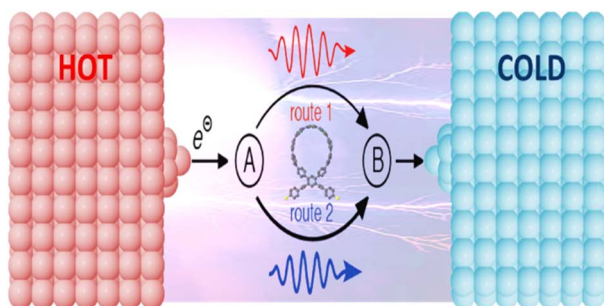
6290



Green and efficient synthesis of 5-amino-1H-pyrazole-5-carbonitriles utilizing novel modified LDH

Sarieh Momeni and Ramin Ghorbani-Vaghei*

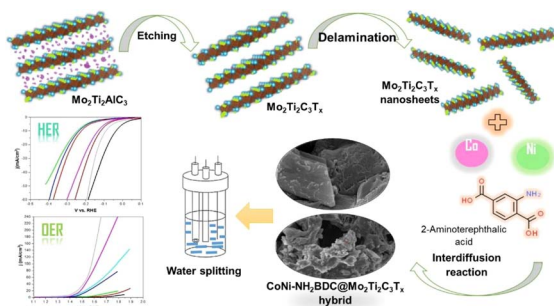
6303



Quantum interference features and thermoelectric properties of macrocyclic-single molecules: theoretical and modelling investigation

Sarah Hussein Halboos, Oday A. Al-Owaedi* and Enas M. Al-Robayi

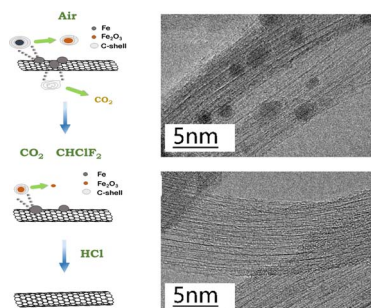
6317



Layered MOF supported on 2D delaminated MXene ($\text{Mo}_2\text{Ti}_2\text{C}_3$) nanosheets boosted water splitting

Maida Murtaza, Komal Farooq, Waqas Ali Shah, Iftikhar Ahmad and Amir Waseem*

6328



Freon- CO_2 -assisted purification of single-walled carbon nanotubes

Yiman Huang, Xiao Zhu,* Tao Chen, Hongyan Li, Liang Han and Xilai Jia*



6336

Exsolution of Ni nanoparticles in A-site excess STO films

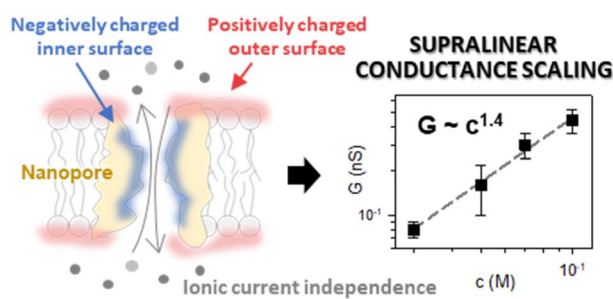
Kevin G. Both,^{*} Dragos Neagu, Øystein Prytz, Truls Norby and Athanasios Chatzidakis^{*}



6344

Supralinear scaling behavior of ionic transport in membrane nanochannels regulated by outer-surface charges

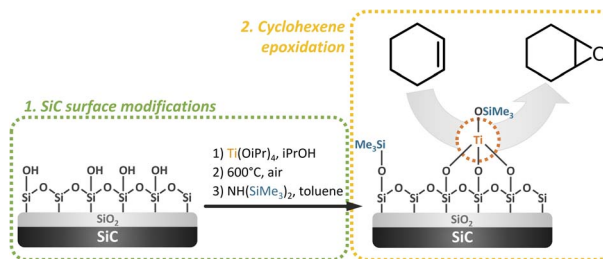
Laidy M. Alvero-González, Marcel Aguilera-Arzo, D. Aurora Perini, Lucie A. Bergdoll, María Queralt-Martin^{*} and Antonio Alcaraz^{*}



6358

Titanium dioxide functionalized silicon carbide phases as heterogeneous epoxidation catalysts

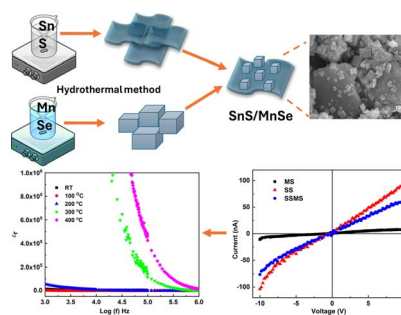
Léa Gonçalves, Olinda Gimello, Karim Bouchmella, Peter Hesemann and Johan G. Alauzun^{*}



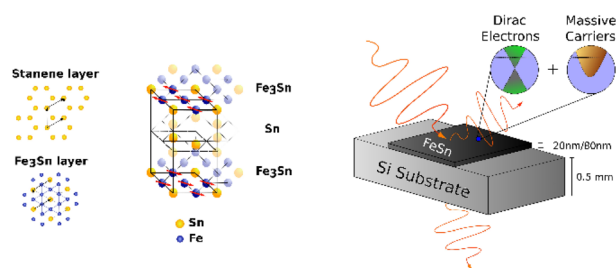
6365

SnS/MnSe heterostructures for enhanced optoelectronics and dielectric applications

Abinash Parida, Satish Kumar Samal, Sripan Chinnaiyah and Ramakanta Naik^{*}



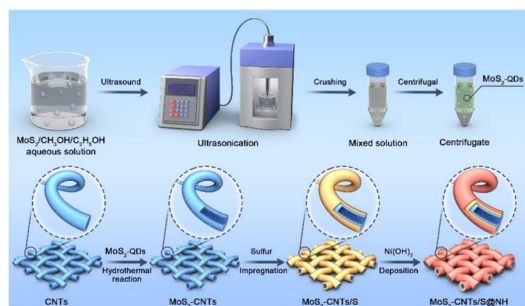
6378



Evidence of high electron mobility in magnetic kagome topological metal FeSn thin films

Lorenzo Mosesso,* Luca Tomarchio, Niraj Bhattarai, Salvatore Macis, Paola Gori, Antonio Grilli, Mariangela Cestelli Guidi, John Philip, Olivia Pulci and Stefano Lupi

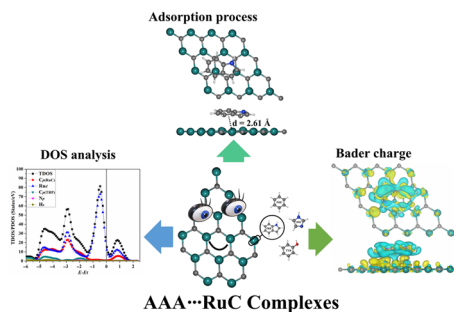
6386



MoS₂ quantum dot-decorated CNT networks as a sulfur host for enhanced electrochemical kinetics in advanced lithium–sulfur batteries

Meng Wei,* Hanqing Lu, Zhen Wang, Baowen Lu, Pengtao Wang, Xinxin Zhang, Bingjie Feng, Yingjie Xie, Tao Zhang, Guanghui Liu and Song Xu*

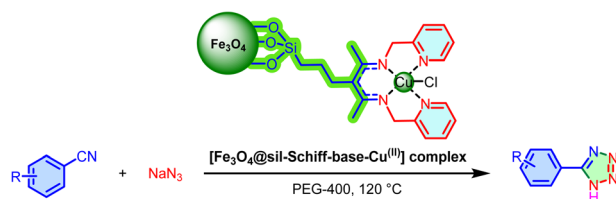
6398



RuC nanosheet as a promising biosensing material for detecting the aromatic amino acids: a DFT study

Mahmoud A. A. Ibrahim,* Nada K. M. Ahmed, Amna H. M. Mahmoud, Mohamed A. El-Tayeb, Ashraf M. M. Abdelbacki, Shahzeb Khan, Mahmoud E. S. Soliman and Tamer Shoeib*

6408



Synthesis of a novel nanomagnetic N₄ bis schiff base complex of copper(II) as an efficient catalyst for click synthesis of tetrazoles

Chou-Yi Hsu, Ahmed Rafiq AlBajalan,* Sameer A. Awad, Muath Suliman, Nizomiddin Juraev, Carlos Rodriguez-Benites, Hamad AlMohamadi and Abed J. Kadhim



6420

Injectable pH-responsive polypeptide hydrogels for local delivery of doxorubicin

Yijun Guo, Yong Chen, Yiqun Wu, Ying Zhu, Shiyao Luo, Juan Shen* and Yongjun Luo*

