

# Nanoscale Horizons

The home for rapid reports of exceptional significance in nanoscience and nanotechnology

[rsc.li/nanoscale-horizons](https://rsc.li/nanoscale-horizons)

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 2055-6756 CODEN NHAOAW 9(1) 1-176 (2024)



### Cover

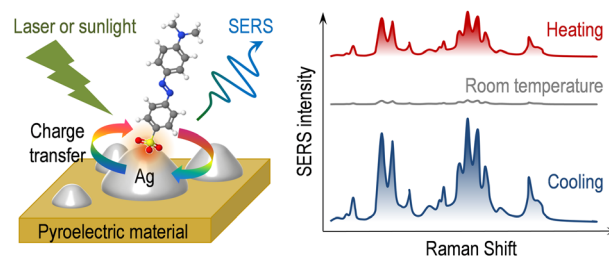
See Dong-Wook Han *et al.*, pp. 93-117.  
Image reproduced by permission of Dong-Wook Han from *Nanoscale Horiz.*, 2024, 9, 93.

## EDITORIALS

8

### Enhancing SERS activity with a pyroelectric-induced charge-transfer effect

Xiaolu Zhuo



11

### Looking back at 2023



# Environmental Science: Atmospheres

GOLD  
OPEN  
ACCESS

Connecting communities  
and inspiring new ideas



Open Access Article. Published on 18 December 2023. Downloaded on 2/20/2025 2:49:35 AM.  
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

[rsc.li/submittoEA](https://rsc.li/submittoEA)

Fundamental questions  
Elemental answers

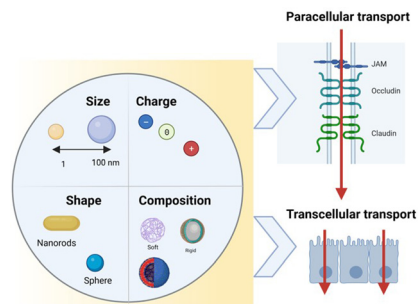


## REVIEWS

14

### Enhancing paracellular and transcellular permeability using nanotechnological approaches for the treatment of brain and retinal diseases

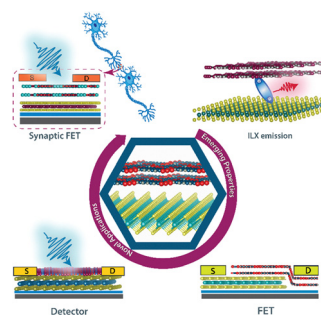
Asmaa Khalil, Alexandre Barras, Rabah Boukherroub, Ching-Li Tseng, David Devos, Thierry Burnouf, Winfried Neuhaus and Sabine Szunerits\*



44

### van der Waals 2D transition metal dichalcogenide/organic hybridized heterostructures: recent breakthroughs and emerging prospects of the device

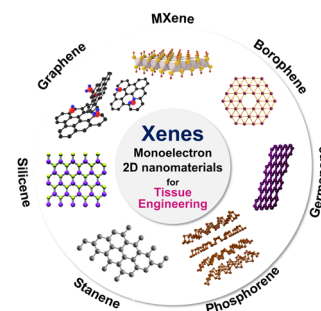
Sk Md Obaidulla,\* Antonio Supina, Sherif Kamal, Yahya Khan and Marko Kralj



93

### MXene and Xene: promising frontier beyond graphene in tissue engineering and regenerative medicine

Moon Sung Kang, Hee Jeong Jang, Hyo Jung Jo, Iruthayapandi Selestin Raja and Dong-Wook Han\*

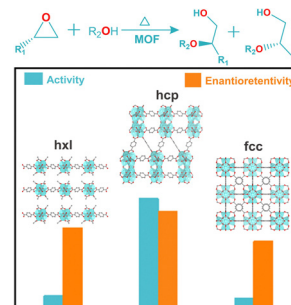


## COMMUNICATIONS

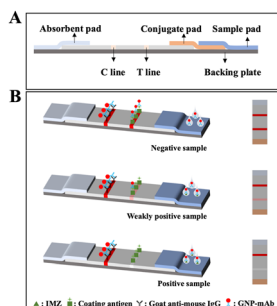
118

### Modulation of the assembly fashion among metal–organic frameworks for enantioselective epoxide activation

Jun Guo,\* Xiaomin Xue, Fangfang Li, Meiting Zhao, Youcong Xing, Yanmin Song, Chang Long, Tingting Zhao, Yi Liu\* and Zhiyong Tang\*



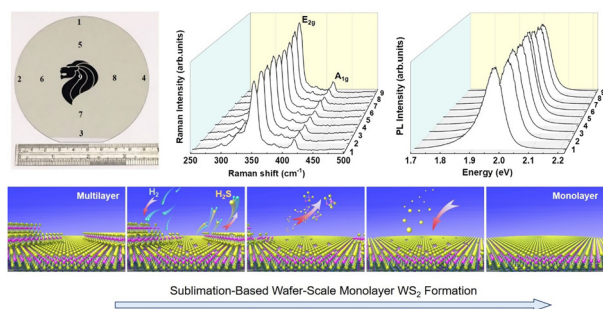
123



### Gold nanoparticle-based immunochromatographic assay for rapid detection of imazalil

Xinxin Xu, Aihong Wu, Lingling Guo, Hua Kuang, Liguang Xu, Chuanlai Xu\* and Liqiang Liu\*

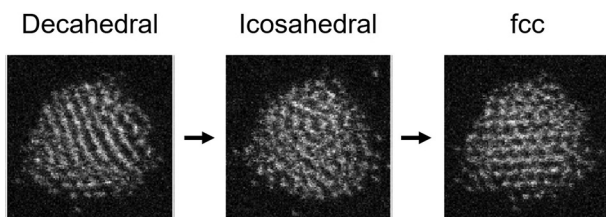
132



### Sublimation-based wafer-scale monolayer WS<sub>2</sub> formation via self-limited thinning of few-layer WS<sub>2</sub>

Mingxi Chen, Jianwei Chai, Jing Wu, Haofei Zheng, Wen-Ya Wu, James Lourembam, Ming Lin, Jun-Young Kim, Jaewon Kim, Kah-Wee Ang, Man-Fai Ng, Henry Medina,\* Shi Wun Tong\* and Dongzhi Chi\*

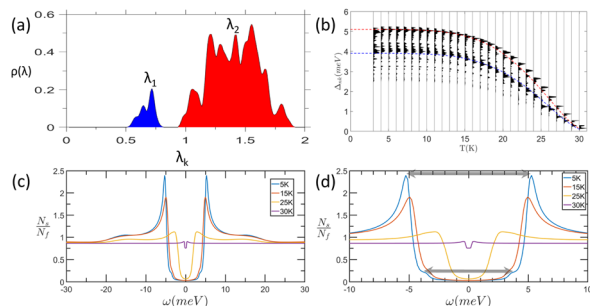
143



### Frame-by-frame observations of structure fluctuations in single mass-selected Au clusters using aberration-corrected electron microscopy

Malcolm Dearg, Cesare Roncaglia, Diana Nelli, El Yakout El Koraychy, Riccardo Ferrando, Thomas J. A. Slater\* and Richard E. Palmer\*

148



### Two-gap topological superconductor LaB<sub>2</sub> with high T<sub>c</sub> = 30 K

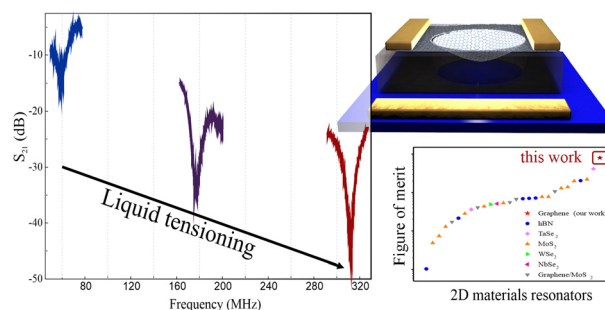
Chin-Hsuan Chen, Ye-Shun Lan, Angus Huang and Horng-Tay Jeng\*



156

## Ultrahigh-quality graphene resonators by liquid-based strain-engineering

Ding-Rui Chen, I-Fan Hu, Hao-Ting Chin, Yu-Chi Yao, Radha Raman, Mario Hofmann, Chi-Te Liang\* and Ya-Ping Hsieh\*



162

## Enriching 2D transition metal borides via MB XMenes (M = Fe, Co, Ir): Strong correlation and magnetism

Jiawei Tang, Shaohan Li, Duo Wang, Qi Zheng, Jing Zhang, Tao Lu, Jin Yu, Litao Sun, Baisheng Sa, Bobby G. Sumpter, Jingsong Huang and Weiwei Sun\*

