# Nanoscale Advances

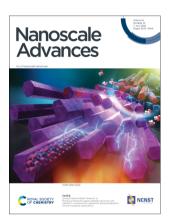
An open access journal publishing across the breadth of nanoscience and nanotechnology

# 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.

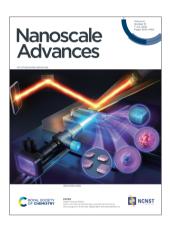
#### IN THIS ISSUE

ISSN 2516-0230 CODEN NAADAI 6(13) 3243-3464 (2024)



#### Cover

See Shunya Sakane, Hideki Tanaka et al., pp. 3299-3305. Image reproduced by permission of Shunya Sakane and Hideki Tanaka from Nanoscale Adv., 2024, 6, 3299. Image created by Takashi Tsujino.



#### Inside cover

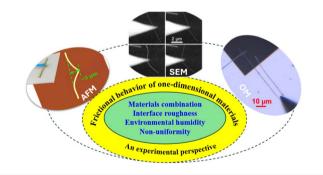
See Yangi Yang and Mi Li, pp. 3306-3319. Image reproduced by permission of Mi Li from Nanoscale Adv., 2024, 6, 3306.

# **REVIEW**

3251

# Frictional behavior of one-dimensional materials: an experimental perspective

Tursunay Yibibulla, Lizhen Hou,\* James L. Mead, Han Huang, Sergej Fatikow and Shiliang Wang\*

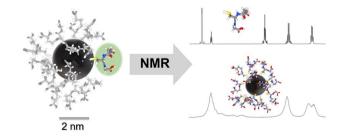


# **MINIREVIEW**

3285

# Possibilities and limitations of solution-state NMR spectroscopy to analyze the ligand shell of ultrasmall metal nanoparticles

Natalie Wolff, Christine Beuck, Torsten Schaller and Matthias Epple\*







# ChemComm

# Uncover new possibilities with outstanding preliminary research

Original discoveries, fuelling every step of scientific progress

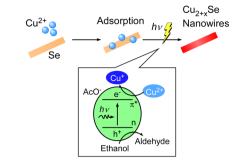
rsc.li/chemcomm

Fundamental questions Elemental answers

#### 3299

# Precise synthesis of copper selenide nanowires with tailored Cu vacancies through photo-induced reduction for thermoelectric applications

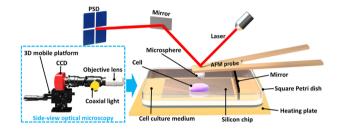
Shunya Sakane,\* Tatsuki Miura, Kazuki Munakata, Yusuke Morikawa, Shunichiro Miwa, Riku Yamanaka, Toshiki Sugai, Akito Ayukawa, Haruhiko Udono and Hideki Tanaka\*



#### 3306

# Side-view optical microscopy-assisted atomic force microscopy for thickness-dependent nanobiomechanics

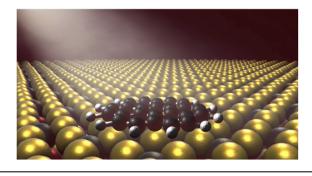
Yanqi Yang and Mi Li\*



#### 3320

#### Towards molecular controlled magnonics

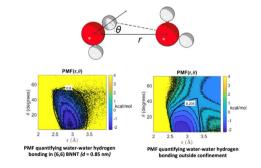
Alberto M. Ruiz, Gonzalo Rivero-Carracedo, Andrey Rybakov, Sourav Dey and José J. Baldoví\*



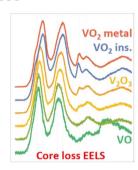
# 3329

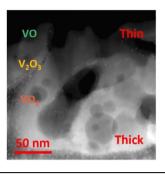
# Strength, number, and kinetics of hydrogen bonds for water confined inside boron nitride nanotubes

Bhargav Sai Chava and Siddhartha Das\*



#### 3338

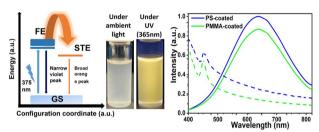




# Analytical electron microscopy analysis of insulating and metallic phases in nanostructured vanadium dioxide

Jan Krpenský, Michal Horák, Jiří Kabát, Jakub Planer, Peter Kepič, Vlastimil Křápek\* and Andrea Konečná\*

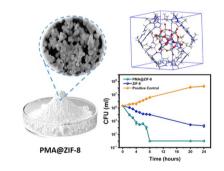
3347



Room temperature synthesis of nanocomposite thin films with embedded Cs<sub>2</sub>AgIn<sub>0.9</sub>Bi<sub>0.1</sub>Cl<sub>6</sub> lead-free double perovskite nanocrystals with long-term water stability, wide range pH tolerance, and high quantum

Steevanson Bayer, Jason Ho Yin Yu and Stefan Nagl\*

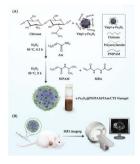
3355



Zeolitic imidazolate framework-8 encapsulated with Mo-based polyoxometalates as surfaces with antibacterial activity against Escherichia coli

Mariam M. Abdelkhalek, Aya M. Mohamed, Rehab Z. Abdallah, Ghada E. Khedr, Rania Siam and Nageh K. Allam\*

3367



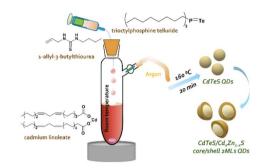
Enhancing MRI through high loading of superparamagnetic nanogels with high sensitivity to the tumor environment

Jinfeng Liao, Liangyu Zhou, Yongzhi Wu, Zhiyong Qian and Pei Li\*

# 3377

Disubstituted thiourea as a suitable sulfur source in the gram-scale synthesis of yellow- and red-emitting CdTeS/Cd<sub>x</sub>Zn<sub>1-x</sub>S core/shell quantum dots

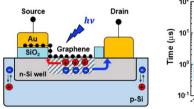
Liudmila Loghina,\* Jakub Houdek, Stanislav Slang, Bozena Frumarova, Miroslav Cieslar and Miroslav Vlcek

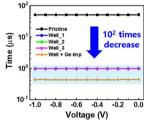


#### 3391

# Demonstration of a low power and high-speed graphene/silicon heterojunction near-infrared photodetector

Min Gyu Kwon, Cihyun Kim, Seung-Mo Kim, Tae Jin Yoo, Yongsu Lee, Hyeon Jun Hwang, Sanghan Lee\* and Byoung Hun Lee\*

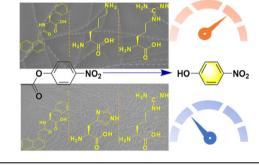




#### 3399

# 1-Naphthylacetic acid appended amino acids-based hydrogels: probing of the supramolecular catalysis of ester hydrolysis reaction

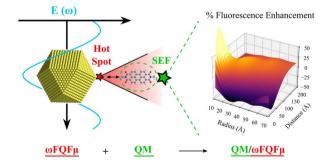
Ruchika Bassan, Biplab Mondal, Mayank Varshney and Subhasish Roy\*



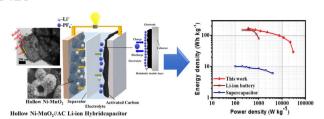
#### 3410

# Multiscale modeling of surface enhanced fluorescence

Pablo Grobas Illobre, Piero Lafiosca, Teresa Guidone, Francesco Mazza, Tommaso Giovannini\* and Chiara Cappelli\*



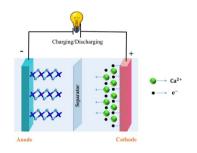
#### 3426



# Hierarchical hollow porous structures of nickel-doped $\lambda\text{-MnO}_2$ anodes for Li-ion energy storage systems

Venugopal Nulu, Arunakumari Nulu and Keun Yong Sohn\*

3441

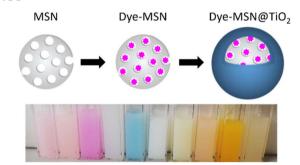


Charging and discharging process of Calcium ion storage battery

Recent advances in Zr and Hf-based MXenes and their hetero-structure as novel anode materials for Ca-ion batteries: theoretical insights from DFT approach

Tanvir Ahmed, Afiya Akter Piya and Siraj Ud Daula Shamim\*

3450



Titania-mediated stabilization of fluorescent dye encapsulation in mesoporous silica nanoparticles

Laura Spitzmüller,\* Jonathan Berson, Fabian Nitschke, Thomas Kohl and Thomas Schimmel