

IN THIS ISSUE

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Cover

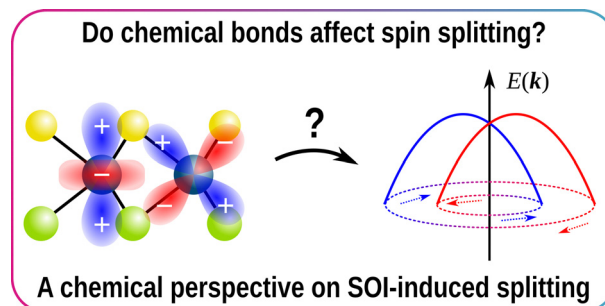
See Majdi Hochlaf
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2023, 25, 30198.

TUTORIAL REVIEW

30099

Rashba effect: a chemical physicist's approach

Maciej J. Szary

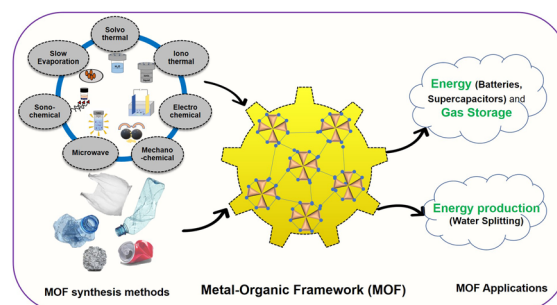


REVIEW

30116

Metal–organic frameworks (MOFs) for energy production and gaseous fuel and electrochemical energy storage applications

Mariyappan Shanmugam, Nithish Agamendran,
Karthikeyan Sekar* and Thillai Sivakumar Natarajan*



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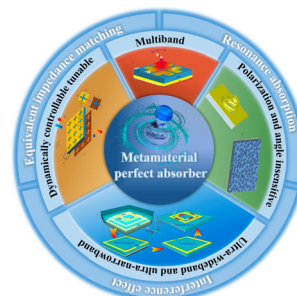


PERSPECTIVES

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Structures, principles, and properties of metamaterial perfect absorbers

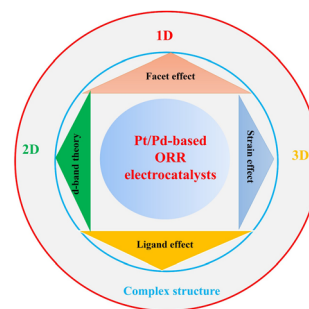
Chenxu Zhao, Huan Wang, Yanyan Bu, Hui Zou* and Xiangfu Wang*



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Nanostructure engineering of Pt/Pd-based oxygen reduction reaction electrocatalysts

Le Li,* Xintong Ye, Qi Xiao, Qianyi Zhu, Ying Hu and Meijun Han

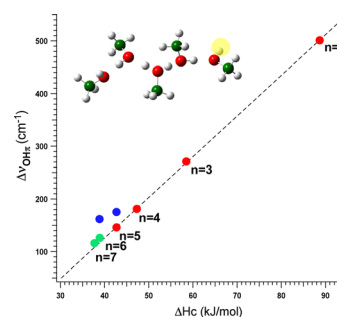


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Experimental confirmation of the Badger–Bauer rule in the protonated methanol clusters: weak hydrogen bond formation as a measure of terminal OH acidity in hydrogen bond networks

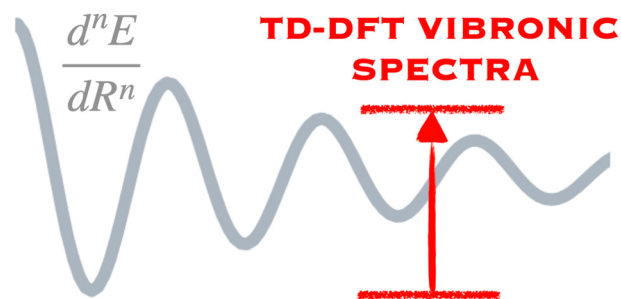
Takeru Kato and Asuka Fujii*



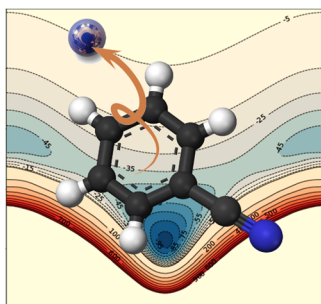
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Pitfall in simulations of vibronic TD-DFT spectra: diagnosis and assessment

Sebastian P. Sitkiewicz,* Eduard Matito, Josep M. Luis* and Robert Zalesny*



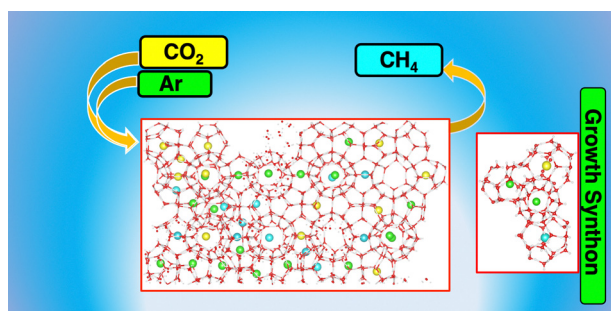
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Towards the generation of potential energy surfaces of weakly bound medium-sized molecular systems: the case of benzonitrile–He complex

Eya Derbali, Yosra Ajili,* Bilel Mehnen, Piotr S. Żuchowski, Dariusz Kędziera,* Muneerah Mogren Al-Mogren, Nejm-Edine Jaidane and Majdi Hochlaf*

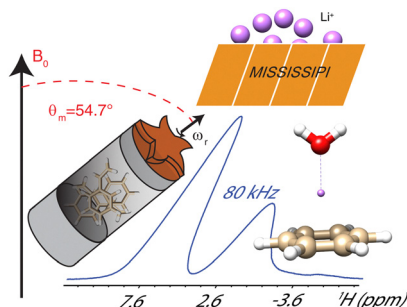
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Carbon dioxide sequestration in natural gas hydrates – effect of flue and noble gases

Manju Sharma* and Satyam Singh

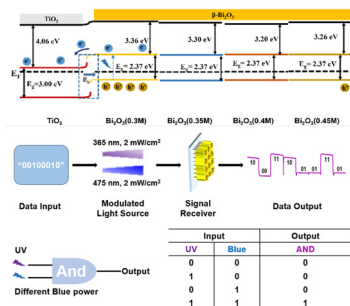
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Regulating polystyrene glass transition temperature by varying the hydration levels of aromatic ring/Li⁺ interaction

Sze Yuet Chin, Yunpeng Lu, Weishuai Di, Kai Ye, Zihan Li, Chenlu He, Yi Cao, Chun Tang and Kai Xue*

30228



Improved performance of UV-blue dual-band Bi₂O₃/TiO₂ photodetectors and application of visible light communication with UV light encryption

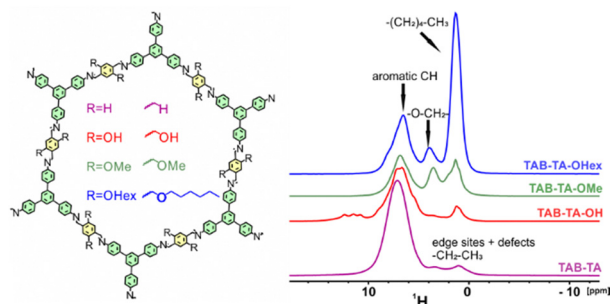
Qin Zheng, Jianping Xu,* Shaobo Shi, Jing Chen, Jianghua Xu, Lina Kong, Xiaosong Zhang and Lan Li



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High-field and fast-spinning ^1H MAS NMR spectroscopy for the characterization of two-dimensional covalent organic frameworks

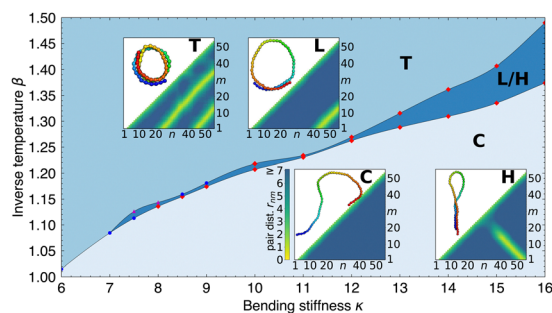
Nikolaj Lopatik, Ankita De, Silvia Paasch, Andreas Schneemann and Eike Brunner*



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Secondary-structure phase formation for semiflexible polymers by bifurcation in hyperphase space

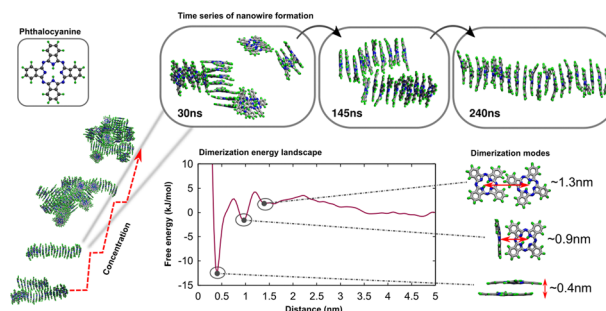
Dilimulati Aierken* and Michael Bachmann*



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Molecular mechanisms underlying nanowire formation in pristine phthalocyanine

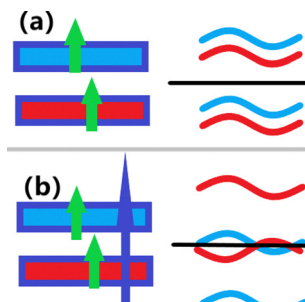
Aadil Pinjari, Deepashri Saraf* and Durba Sengupta*



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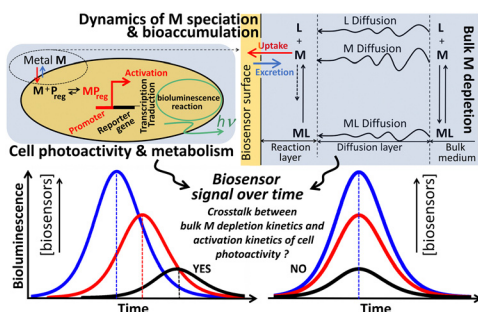
Electric-field induced half-metallic properties in an experimentally synthesized CrSBr monolayer

Hao-Tian Guo, San-Dong Guo* and Yee Sin Ang



RESEARCH PAPERS

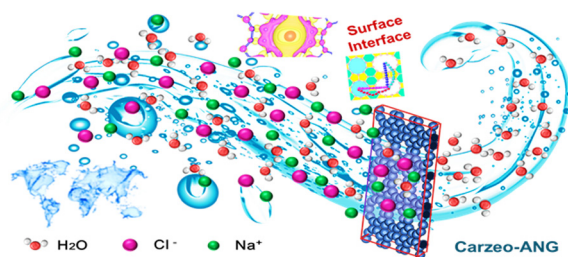
30276



Kinetics of metal detection by luminescence-based whole-cell biosensors: connecting biosensor response to metal bioavailability, speciation and cell metabolism

Jérôme F. L. Duval,* Lorenzo Maffei, Eva Delatour, Marie Zaffino and Christophe Pagnout

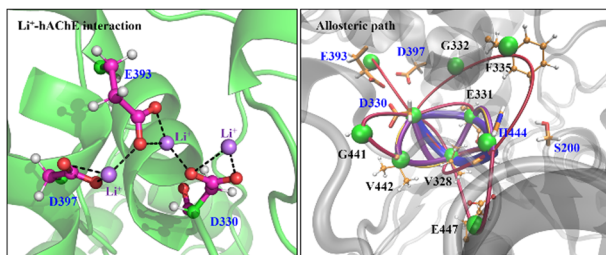
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Surface/interfacial transport through pores control desalination mechanisms in 2D carbon-based membranes

Xiaoyang Zhao, Kun Meng,* Yutao Niu, Sen Ming, Ju Rong, Xiaohua Yu and Yannan Zhang

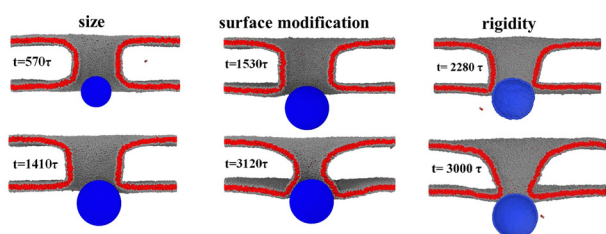
30308



Selective modulation of alkali metal ions on acetylcholinesterase

Xia Mu, Shengwei Yuan, Dinglin Zhang, Rui Lai, Chenyi Liao* and Guohui Li*

30319



Probe the nanoparticle–nucleus interaction via coarse-grained molecular model

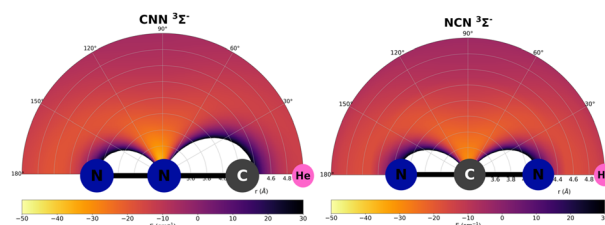
LiuYang Zhang, Ning Liu* and Xianqiao Wang



30330

Collision-induced state-changing rate coefficients for cyanogen backbones $\text{NCN } ^3\Sigma^-$ and $\text{CNN } ^3\Sigma^-$ in astrophysical environments

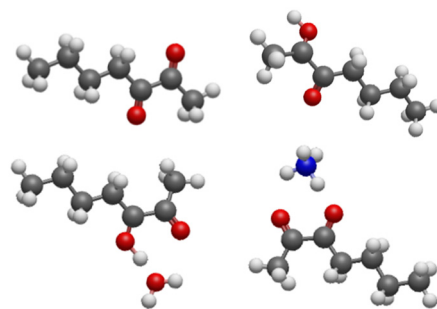
Lola González-Sánchez, Ersin Yurtsever, Jorge Alonso de la Fuente, Cristina Sanz-Sanz, Roland Wester and Francesco A. Gianturco*



30343

Gas phase H^+ , H_3O^+ and NH_4^+ affinities of oxygen-bearing volatile organic compounds; DFT calculations for soft chemical ionisation mass spectrometry

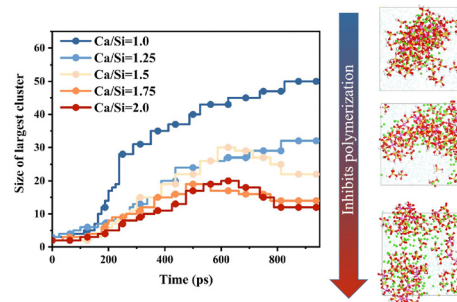
Maroua Omezzine Gnioua, Anatolii Spesyvyi and Patrik Španěl*



30349

The inhibitory effect of excess calcium ions on the polymerization process of calcium aluminate silicate hydrate (CASH) gel

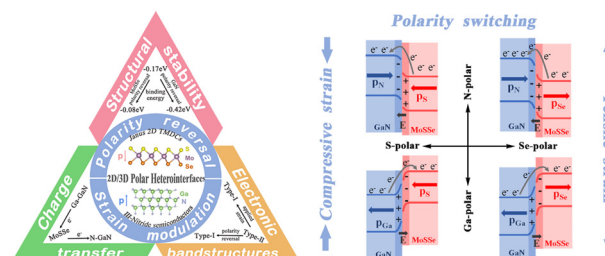
Dongshuai Hou, Mengqi Sun, Muhan Wang, Zheng Chen, Xinpeng Wang, Yue Zhang and Pan Wang*



30361

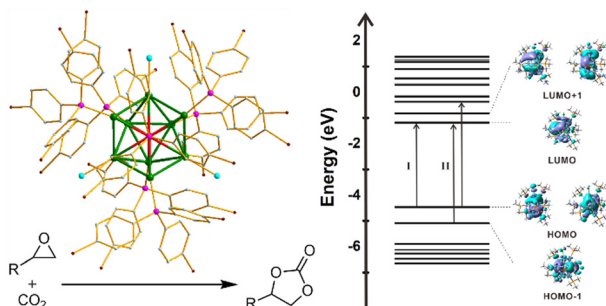
Polarity reversal and strain modulation of Janus MoSSe/GaN polar semiconductor heterostructures

Delin Kong, Feng Tian, Yingying Xu, Shaoqun Zhu, Zetong Yu, Lefeng Xiong, Peipei Li, Huiyun Wei, Xinhe Zheng* and Mingzeng Peng*



RESEARCH PAPERS

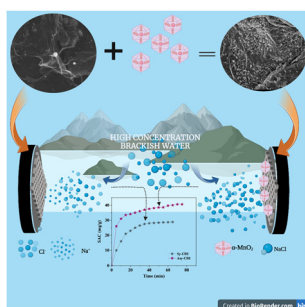
30373



One-step preparation of Pt/Ag nanoclusters for CO₂ transformation

Meng Wang, Simin Li, Xiongfai Tang, Dongjie Zuo, Yanyuan Jia,* Shuo Guo, Zong-Jie Guan* and Hui Shen*

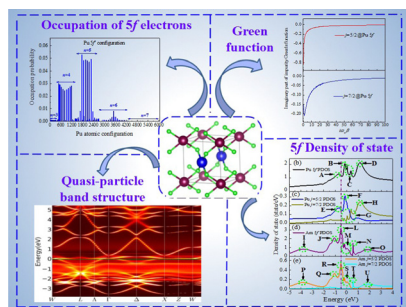
30381



Solar reduced graphene oxide decorated with manganese dioxide nanostructures for brackish water desalination using asymmetric capacitive deionization

Shreerang D. Datar, Nitish Kumar, Vrushali Sawant, Noora Shaikh and Neetu Jha*

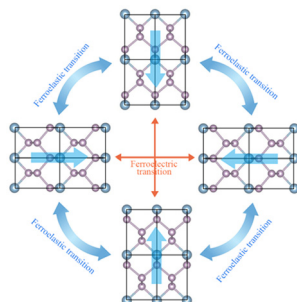
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Electron correlation and relativistic effects on the electronic properties of a plutonium and americium mixed oxide (PuAmO₄): from single-particle approximation to dynamical mean-field theory

Ru-song Li,* Jin-tao Wang, Zhi-yong Liu, Xiao-hua Zhou, Ze-lin Cao and Zheng Xie*

30405



Auxetic and multiferroic MP₅ (M = Al, Ga): a novel 2D material with negative Poisson's ratio and high anisotropic carrier mobility

Qingwen Lan and Changpeng Chen*



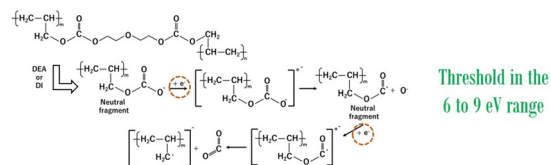
RESEARCH PAPERS

30412

Revealing the mechanism of damage to the carbonate ester in PADC polymeric nuclear track detector using low-energy electron stimulated desorption

Tamon Kusumoto, Michel Fromm,* Pierre Cloutier, Andrew D Bass, Léon Sanche and Satoshi Kodaira

The key to understanding the mechanisms of molecular damage by radiation is the number and energy of electrons interacting with fundamental molecular units.

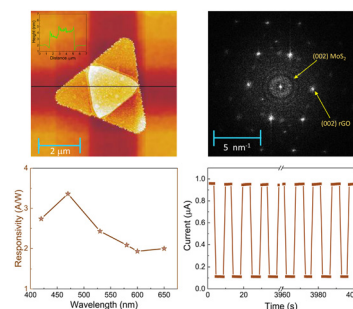


The present results indicate that desorbed O^- signal derives in unirradiated films, from the oxygen atom adjacent to the carbonyl bond.

30419

Photogating induced high sensitivity and speed from heterostructure of few-layer MoS_2 and reduced graphene oxide-based photodetector

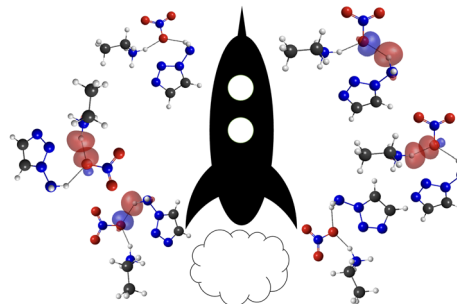
Chayan Das, Ashok Kumar, Suresh Kumar, Neha V. Dambhare, Mahesh Kumar, Arup K. Rath and Satyajit Sahu*



30428

Intermolecular interactions in clusters of ethylammonium nitrate and 1-amino-1,2,3-triazole

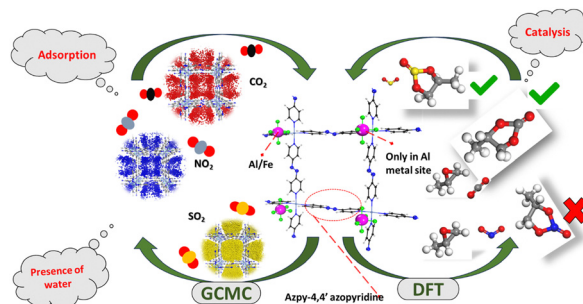
Shinae Kim,* Justin A. Conrad, Garrett M. Tow, Edward J. Maginn, Jerry A. Boatz and Mark S. Gordon*



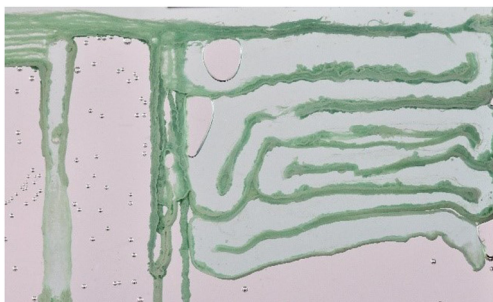
30458

Prediction of the capture and utilization of atmospheric acidic gases by azo-based square-pillared fluorinated MOFs

D. Muthukumar, Athulya S. Palakkal and Renjith S. Pillai*



30469

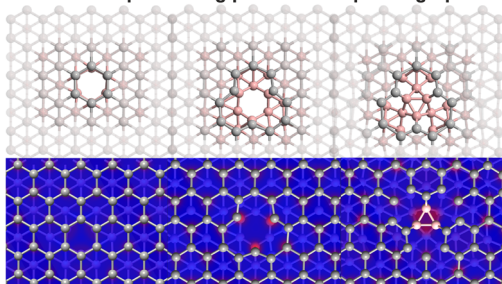


A microfluidic labyrinth self-assembled by a chemical garden

Sergio Testón-Martínez,* Teresa Huertas-Roldán, Pamela Knoll, Laura M. Barge, C. Ignacio Sainz-Díaz and Julyan H. E. Cartwright*

30477

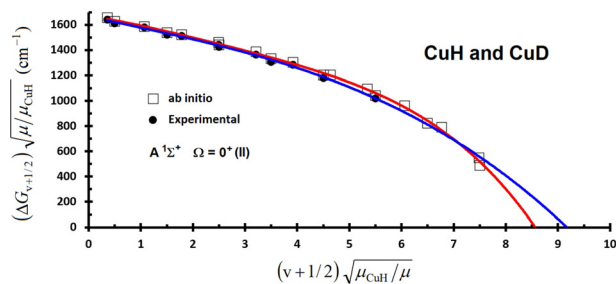
The minimal perforating pores in borophene-graphene



On point perforating defects in bilayer structures

Aleksey I. Kochaev, Vladimir V. Efimov, Savas Kaya, Roberto Flores-Moreno, Konstantin P. Katin and Mikhail M. Maslov*

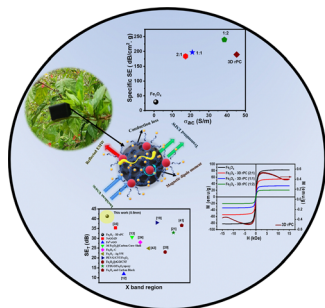
30488



Spin-orbit coupling in low-lying electronic states of CuH

Zeinab Mohammadian and Alireza Shayesteh*

30501



High-performance EMI shielding effectiveness of Fe₃O₄-3D rPC nanocomposites: a systematic optimization in the X-band region

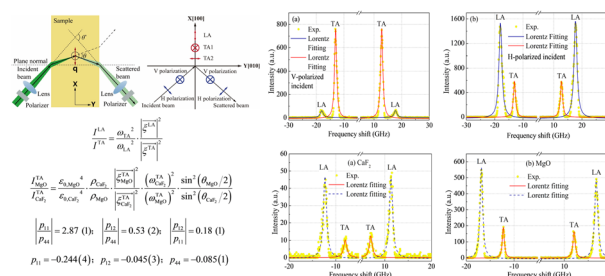
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Photoelasticity of a MgO single crystal from polarized Brillouin scattering spectroscopy

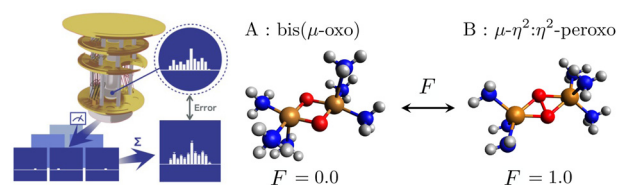
YongQuan Wu,* ZhengPing Bao and JingLin You



30525

Statistical errors in reduced density matrices sampled from quantum circuit simulation and the impact on multireference perturbation theory

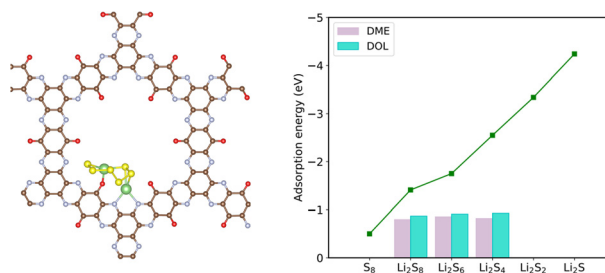
Soichiro Nishio, Yuki Oba and Yuki Kurashige*



30536

A nitrogen-rich two dimensional covalent organic framework with multiple carbonyls as a highly efficient anchoring material for lithium-sulfur batteries

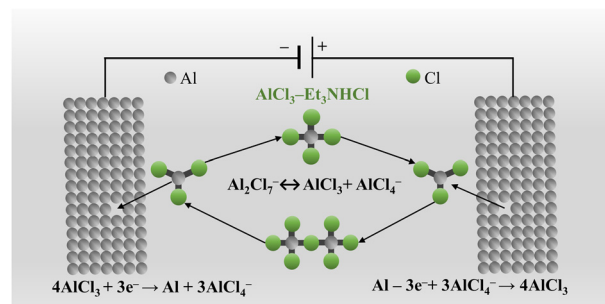
Priya Das and Pranab Sarkar*



30543

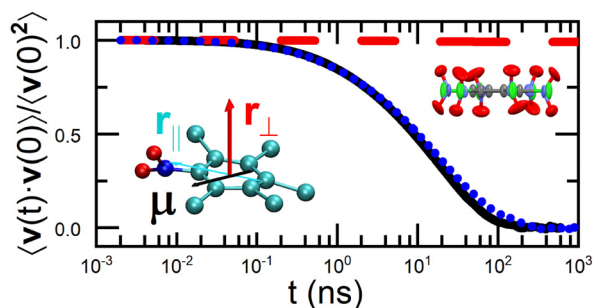
Electrochemical behavior of aluminum in triethylamine hydrochloride-aluminum chloride ionic liquid

Alexey V. Borozdin,* Peter Yu. Shevelin, Vladimir A. Elterman and Liudmila A. Yotshina



RESEARCH PAPERS

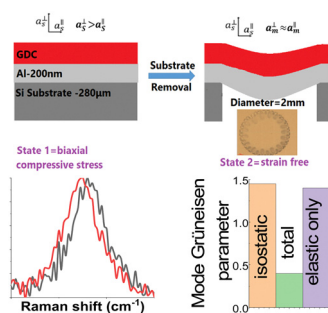
30553



Dynamics and local ordering of pentachloronitrobenzene: a molecular-dynamics investigation

Jonathan F. Gebbia,* Andrés Henao Aristizabal, Philippe Negrier, David Aguilà, Josep Lluís Tamarit and Luis Carlos Pardo

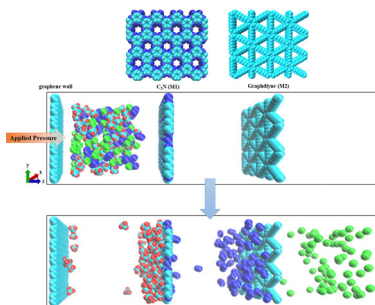
30563



The elastic component of anisotropic strain dominates the observed shift in the F_{2g} Raman mode of anelastic ceria thin films

Daniel Freidzon, Olga Kraynis, Ellen Wachtel, Igor Lubomirsky* and Tsachi Livneh*

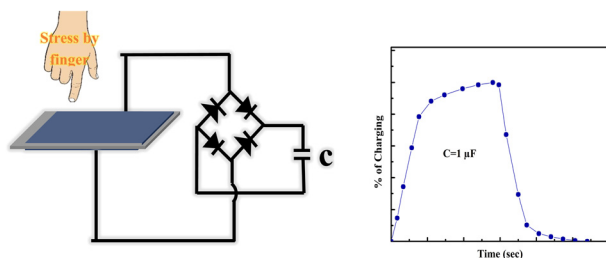
30572



Highly efficient helium purification through a dual-membrane system: insights from molecular dynamics simulations

Siamak Pakdel, Hamid Erfan-Niya,* Jafar Azamat and Amir Hasanzadeh

30583



A self-powered mechanical energy harvester based on $\text{CH}_3\text{NH}_3\text{PbI}_3$ doped P(VDF-HFP)/PANI composite films

Priti Sundar Barman, Samiran Garain* and Prakriti Adhikary*

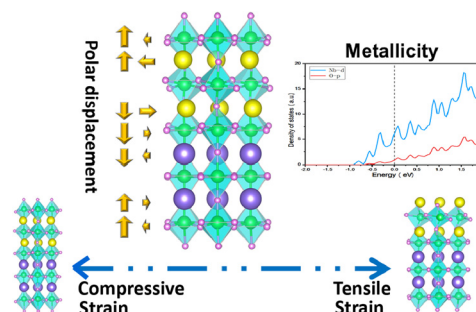


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30596

Polar metals in strain-engineered $\text{KNbO}_3/\text{CaNbO}_3$ superlattices: a first-principles study

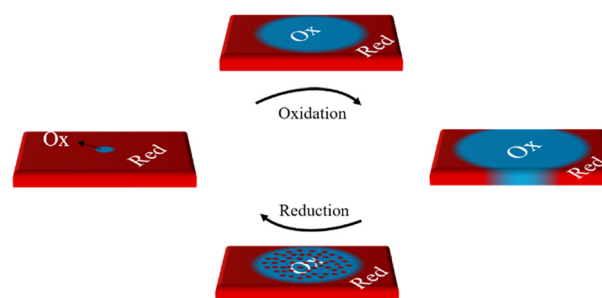
Qihang Liang, Fawei Zheng and Menglei Li*



30606

Autocatalytic solid-state electrochemical reactions: a non-linear kinetic theory of batteries

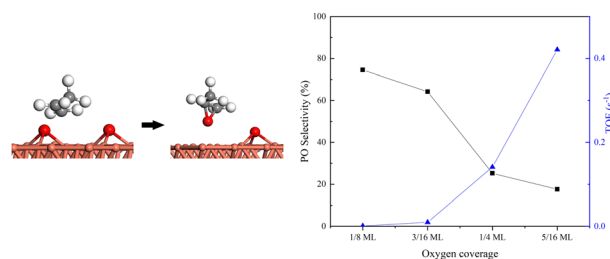
Keyvan Malaie



30612

Investigation of the oxygen coverage effect on the direct epoxidation of propylene over copper through DFT calculations

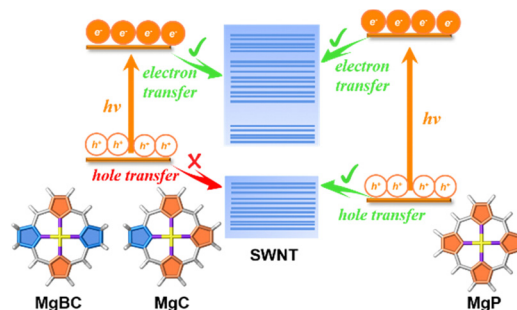
Ben Sun and Gui-Chang Wang*



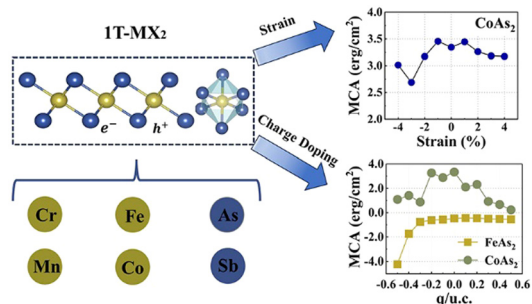
30627

Mechanistic insights into photoinduced energy and charge transfer dynamics between magnesium-centered tetrapyrroles and carbon nanotubes

Jia-Ning Zhou, Ke-Qin Cheng, Xiaolong Zhang, Shubin Yang, Jie Liu, Wenzuo Li, Qingzhong Li, Juan Han,* Xiao-Ying Xie* and Ganglong Cui



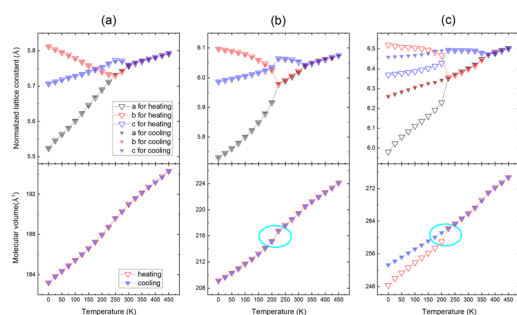
30636



Intrinsic ferromagnetism in two-dimensional 1T-MX₂ monolayers with tunable magnetocrystalline anisotropy

Yonghao Wang, Zesen Lei, Meng Guo, Qilong Sun,*
Cui Jin, Ruishan Tan and Ying Dai*

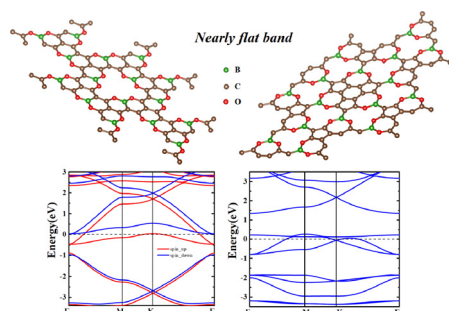
30644



Investigation of phase transition, mechanical behavior and lattice thermal conductivity of halogen perovskites using machine learning interatomic potentials

Yongbo Shi, Yuanyuan Chen, Haikuan Dong,*
Hao Wang and Ping Qian*

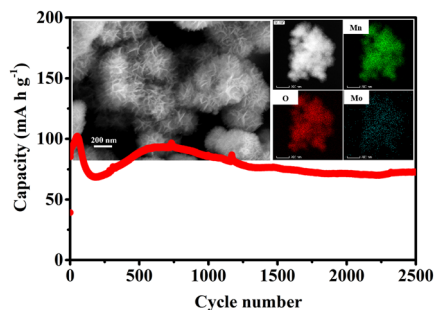
30656



New two-dimensional flat band materials: B₃C₁₁O₆ and B₃C₁₅O₆

Jialuo Dong, Pan Zhou,* Yuzhong Hu and Lizhong Sun*

30663



Inhibition of phase transition from δ -MnO₂ to α -MnO₂ by Mo-doping and the application of Mo-doped MnO₂ in aqueous zinc-ion batteries

Yubin Liu,* Wenjie Chen, Jingjing Su, Xiaojing Zhao and Xiaoyang Pan

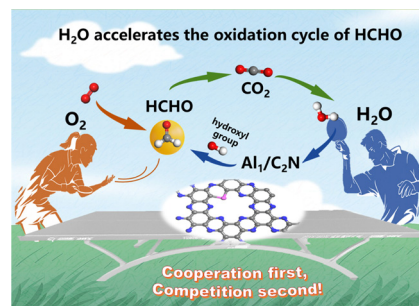


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30670

Unveiling the intrinsic role of water in the catalytic cycle of formaldehyde oxidation: a comprehensive study integrating density functional theory and microkinetic analysis

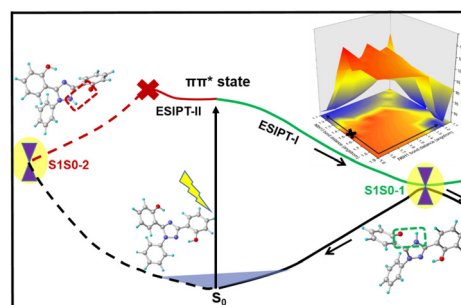
Qianyu Li, Wenlang Li, Jiachun Cao, Junhui Zhou, Didi Li and Zhimin Ao*



30679

Excited-state relaxation mechanisms of 2,2'-(1-phenyl-1H-1,2,4-triazole-3,5-diyl)diphenol: single- or double-proton transfer?

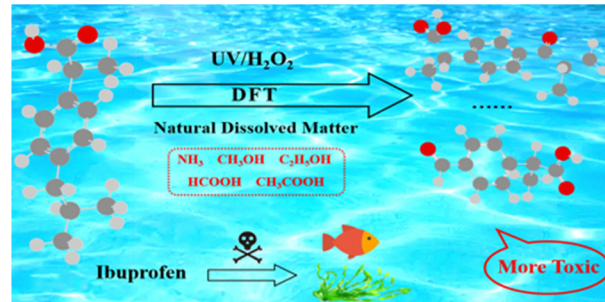
Jiahui Wu, Jihuan He, Wei Wang, Xiaohang Chen and Shu-Hua Xia*



30687

New insights into the degradation mechanism of ibuprofen in the UV/H₂O₂ process: role of natural dissolved matter in hydrogen transfer reactions

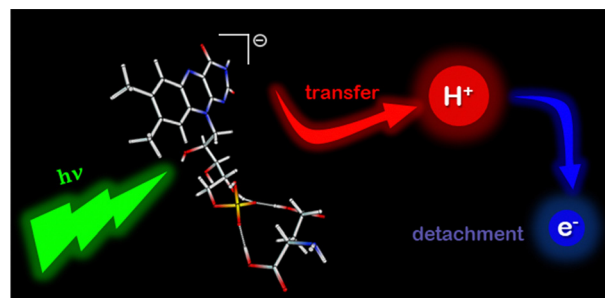
Zhezhen Ding, Jiahui Zhang, Timing Fang, Guohui Zhou, Xiao Tang, Yan Wang and Xiaomin Liu*



30697

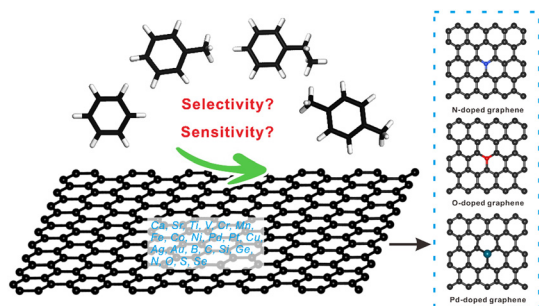
Photodissociative decay pathways of the flavin mononucleotide anion and its complexes with tryptophan and glutamic acid

Kelechi O. Uleanya, Cate S. Anstöter and Caroline E. H. Dessent*



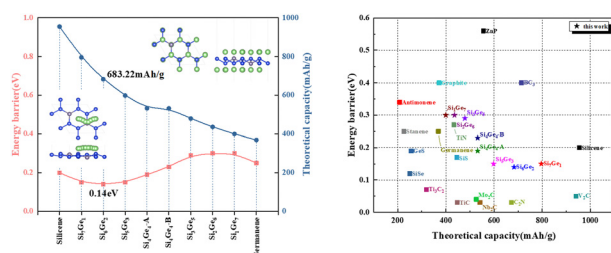
RESEARCH PAPERS

30708

**BTEX sensing potential of elemental-doped graphene: a DFT study**

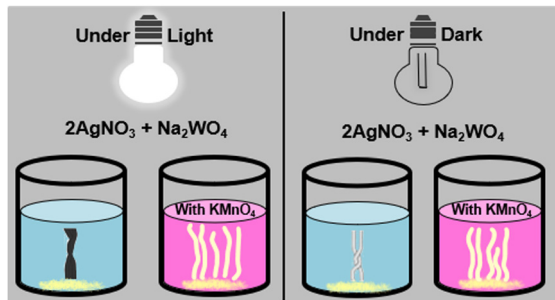
Hongping Zhang,* Run Zhang, Shuchun Hu, Kun Yang, Qingyuan Wang, Huilong Dong, Yuxiang Ni and Wei Feng

30716

**The effect of Ge doping concentration on the electrochemical performance of silicene anode for lithium-ion batteries: a first-principles study**

Jun Song,* Mingjie Jiang, Jodie A. Yuwono, Sailin Liu, Jingxiu Wang, Qi Zhang, Yuhui Chen, Jun Zhang, Xuehong Wu and Juanfang Liu*

30727

**Light-modulated colour transformation in highly intertwined vertically growing silver tungstate tubes**

Vipul Kirtikumar Patel and Balanagulu Busupalli*

CORRECTION

30735

Correction: The solution structures and relative stability constants of lanthanide–EDTA complexes predicted from computation

Ravi D. O'Brien, Thomas J. Summers, Danil S. Kaliakin and David C. Cantu*

