

# Sustainable Energy & Fuels

Interdisciplinary research for the development of sustainable energy technologies

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## IN THIS ISSUE

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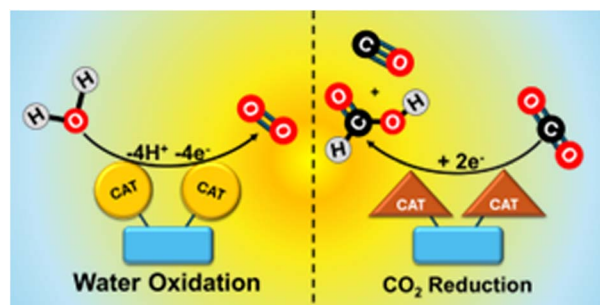
**Cover**  
See Shinya Higashimoto *et al.*, pp. 1626–1635. Image reproduced by permission of Shinya Higashimoto from *Sustainable Energy Fuels*, 2024, 8, 1626.

## REVIEWS

1588

### Multinuclear systems for photo-induced production of green fuels: an overview of homogeneous catalysts based on transition metals

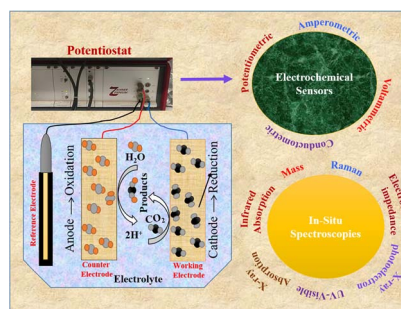
Alessandro Amadeo, Emanuele La Mazza, Antonino Arrigo, Giuseppina La Ganga and Ambra M. Cancelliere\*



1607

### A brief review of *in situ* spectroscopic methods and electrochemical sensors as essential evaluation tools for the electrochemical reduction of CO<sub>2</sub> (EIRC)

V. S. K. Yadav,\* Mohammed A. H. S. Saad, Mohammed J. Al-Marri and Anand Kumar\*



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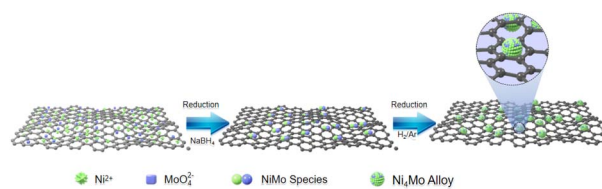
Fundamental questions  
Elemental answers

## COMMUNICATION

1619

Alloying Ni<sub>4</sub>Mo for efficient alkaline hydrogen oxidation and hydrogen evolution reactions

Pengfei Cao, Xinxin Zhang, Lei Wang\* and Honggang Fu\*

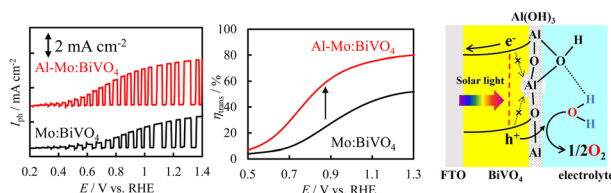


## PAPERS

1626

Boosting charge transport in the BiVO<sub>4</sub> photoanode interface modified with an aluminum hydroxide layer for solar water oxidation

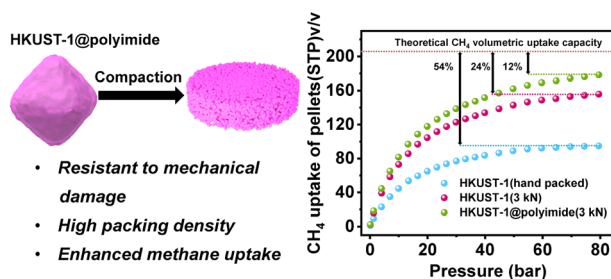
Waka Matsumoto, Takashi Fukushima, Satoshi Heguri, Syuji Fujii and Shinya Higashimoto\*



1636

## Polymer coating assisted shaping of metal–organic framework particles into pellets with enhanced methane uptake

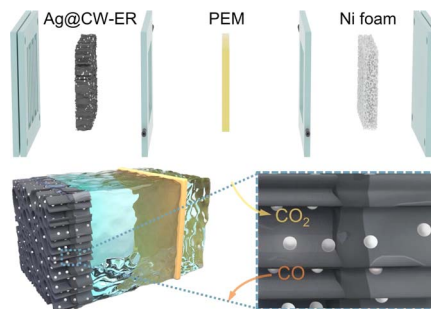
Chunhui Wu,\* Xinxin Chu, Dejun Dai, Xiaoling Wu, Dongxu Wang, Yu Tao, Yue-Biao Zhang and Tao Li\*



1641

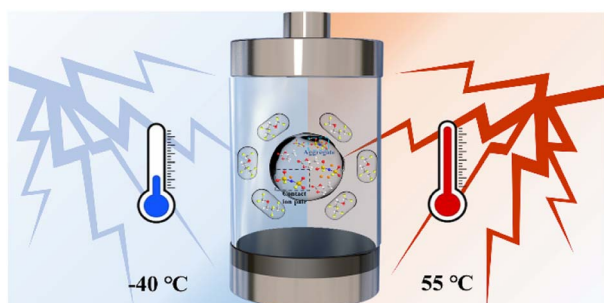
## An integrated carbonized wood-based gas-diffusion electrode for high-current-density CO electro-synthesis in flow cells

Huanhuan Tao, Huaiyu Chang, Fang Wang, Zhengguo Zhang and Shixiong Min\*





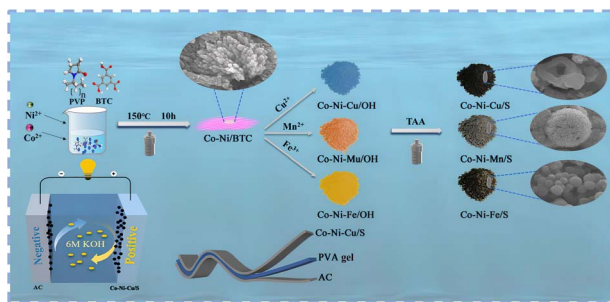
1650



**Novel propylene carbonate based localized high concentration electrolyte with high voltage, flame retardant and wide temperature characteristics enables excellent electrochemical performances of lithium metal batteries**

Pan Luo, Ying Zhang, Jialin Song, Mingshan Wang, Junchen Chen, Bo Yu, Bingshu Guo, Zhiyuan Ma, Liang Li and Xing Li\*

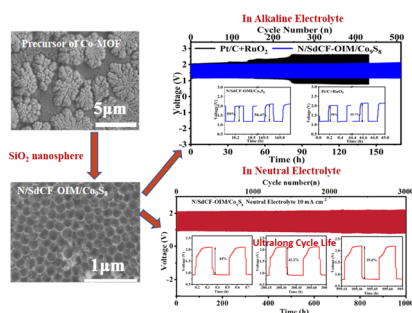
1663



**Ion etching modulates the synthesis of CoNiCu sulfide for high-performance supercapacitors**

Hao Wu, Jie Zhu, Guoxiang Wang,\* Qingwang Min, Boyan Ai, Pengchao Liang, Rui Yuan and Dahui Fang

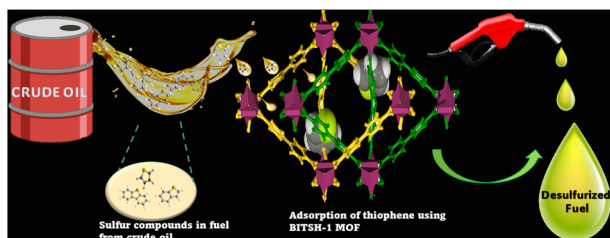
1669



**Synergistic action of highly-active porous carbon-based bifunctional electrocatalysts and neutral electrolyte: endowing zinc-air batteries with ultra-long cycle stability**

Juanjuan Zhao, Xiaohang Ma,\* Lingyun Liu, Weiguang Fang, Zhenfa Zi\* and Mingzai Wu\*

1679



**Cobalt-based metal-organic framework for desulfurization of thiophene as a model fuel**

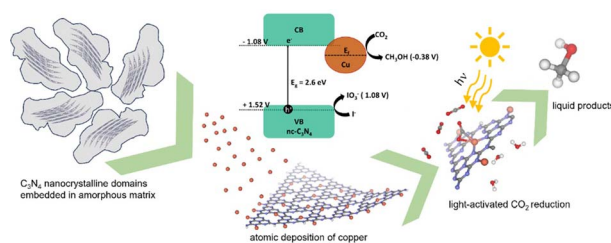
M. Christina Nilavu, T. Leelasree, Himanshu Aggarwal\* and N. Rajesh\*



1691

## Synergy of nanocrystalline carbon nitride with Cu single atom catalyst leads to selective photocatalytic reduction of CO<sub>2</sub> to methanol

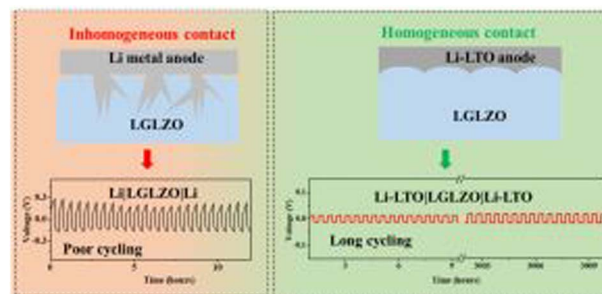
Tara M. LeMercier, Madasamy Thangamuthu,\* Emerson C. Kohlrausch, Yifan Chen, Craig T. Stoppiello, Michael W. Fay, Graham A. Rance, Gazi N. Aliev, Wolfgang Theis, Johannes Biskupek, Ute Kaiser, Anabel E. Lanterna, Jesum Alves Fernandes and Andrei N. Khlobystov\*



1704

## Highly stable all-solid-state batteries with Li–LTO composite anode

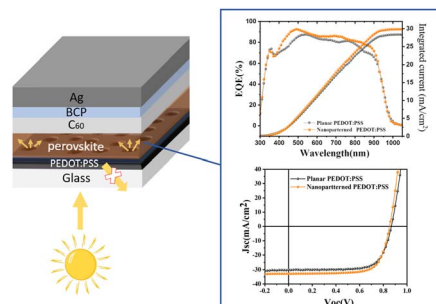
Thamayanthi Panneerselvam,\* R. Murugan and O. V. Sreejith\*



1712

## Reducing optical reflection loss through textured PEDOT:PSS in hybrid Sn–Pb perovskite solar cells

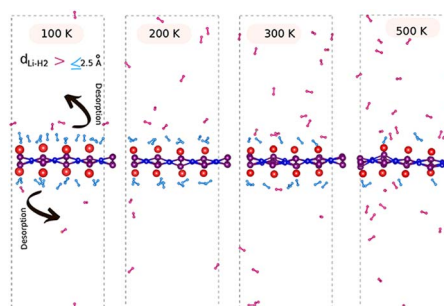
Shih-En Hsu, Wen-Xian Zhu, Dong-Tai Wu, Wen-Li Huang, Li-Ting Xue, Chi-Jing Huang, Chang-Hao Wang, Yun-Shan Li, Wei-Jia Qiu and Chieh-Ting Lin\*



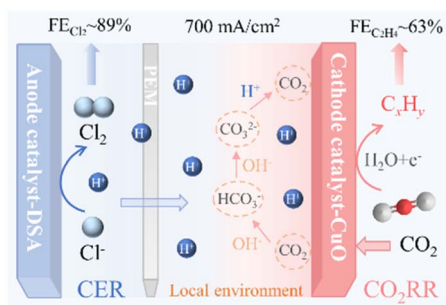
1719

## Lithium decorated 2D orthorhombic (o)-B<sub>2</sub>X<sub>2</sub> monolayers for hydrogen storage: first principles calculations

Ayoub Benaddi,\* Abdelali Elomrani, Mohammed Lamhani, Said Oukahou, Mohammad Maymoun, Mohamed Yassine Fathi and Abdellatif Hasnaoui



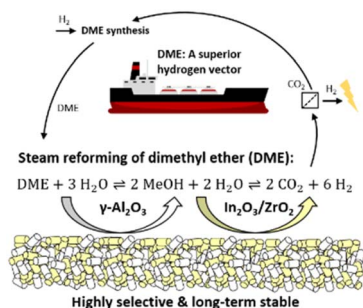
1730



### Acidic chloride electrolyte mediates the high conversion ratio of CO<sub>2</sub>-to-C<sub>2</sub>H<sub>4</sub> and direct production of Cl<sub>2</sub>

Caitao Kang, Chenglong Ding, Yao Li, Yanming Li, Changli Li\* and Jingfu He\*

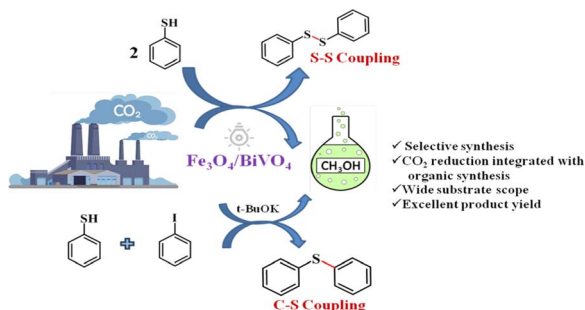
1740



### A highly durable catalyst system for hydrogen production from dimethyl ether

Robert Stöber, Franziska Seidl, Emanuel Hoffmann, Peter Wasserscheid and Patrick Schühle\*

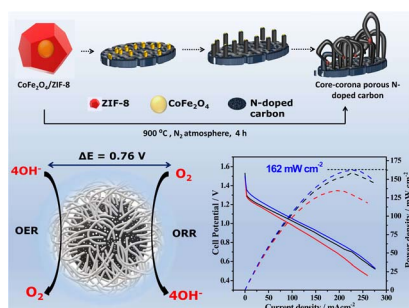
1750



### Photocatalytic CO<sub>2</sub> reduction to methanol integrated with the oxidative coupling of thiols for S–X (X = S, C) bond formation over an Fe<sub>3</sub>O<sub>4</sub>/BiVO<sub>4</sub> composite

Nitish Saini, Sandhya Saini, Santanu Majumder,\* Kyra Sedransk Campbell and Suman L. Jain\*

1761



### Active site exploration of core–corona structured bifunctional cobalt ferrite-containing nitrogen-doped carbon nanotubes for rechargeable zinc–air battery application

Shankar Baskaran, E. A. Anook Nazer and Azhagamuthu Muthukrishnan\*

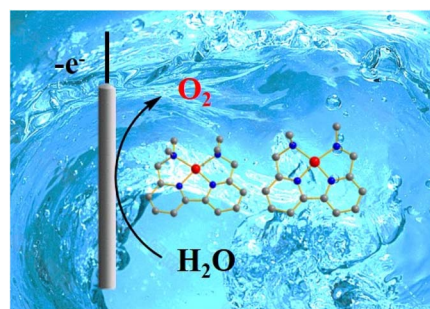


## PAPERS

1769

### Efficient electrochemical water oxidation catalyzed by $N_4$ -coordinated nickel complexes under neutral conditions

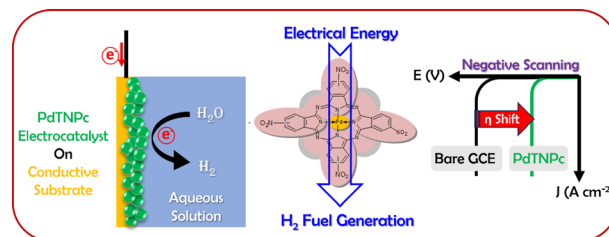
Zhijun Ruan, Jinfeng Dong, Jieying Wang, Zhichao Qi, Xiaoli Chen,\* Xiangming Liang\* and Junqi Lin\*



1775

### Tuning a palladium(II) phthalocyanine embedded hybrid electrocatalyst for the hydrogen evolution reaction

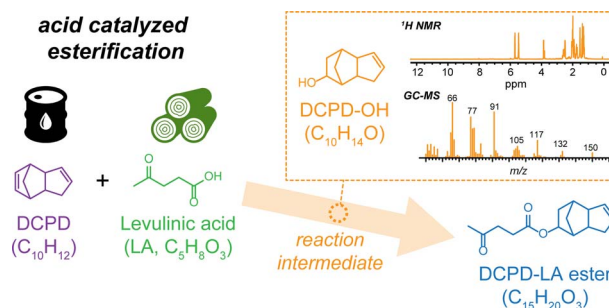
Sowmyashree Hadimane, Shambhulinga Aralekallu and Lokesh Koodlur Sannegowda\*



1788

### Solid acid catalyzed esterification of dicyclopentadiene with organic acids to bio-based functional monomers

Sang-Ho Chung, Marilena Demetriou, Hongqi Wang and N. Raveendran Shiju\*



## CORRECTION

1793

### Correction: Enhanced photoelectrochemical hydrogen production via linked $\text{BiVO}_4$ nanoparticles on anodic $\text{WO}_3$ nanocoral structures

Eunoak Park, JeongEun Yoo\* and Kiyoun Lee\*

