

# Sustainable Energy & Fuels

Interdisciplinary research for the development of sustainable energy technologies

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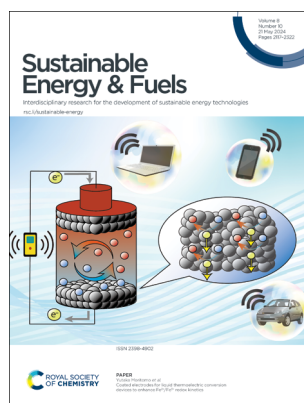
## IN THIS ISSUE

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### Cover

See M. Veronica Sofianos *et al.*, pp. 2125–2137. Image reproduced by permission of M. Veronica Sofianos from *Sustainable Energy Fuels*, 2024, 8, 2125. Art by the team of INMYWORK Studio (<https://inmywork.com>).



### Inside cover

See Yutaka Moritomo *et al.*, pp. 2138–2143. Image reproduced by permission of Yutaka Moritomo from *Sustainable Energy Fuels*, 2024, 8, 2138.

## PAPERS

2125

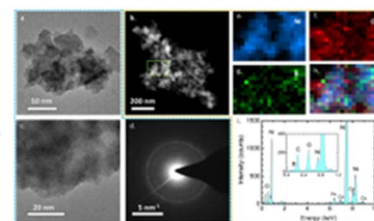
### Engineering 2D nickel boride/borate amorphous/amorphous heterostructures for electrocatalytic water splitting and magnetism

Xu Lin, Vasileios Tzitzios, Qiancheng Zhang, Brian J. Rodriguez, Aran Rafferty, Raman Bekarevich, Michael Pissas and M. Veronica Sofianos\*

#### one-pot chemical reduction method NaBH<sub>4</sub> and NaOH



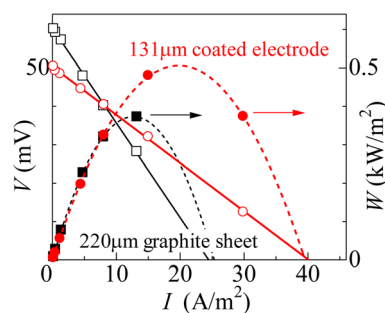
#### amorphous/amorphous nickel boride/borate heterostructures



2138

### Coated electrodes for liquid thermoelectric conversion devices to enhance Fe<sup>2+</sup>/Fe<sup>3+</sup> redox kinetics

Touya Aiba, Dai Inoue and Yutaka Moritomo\*



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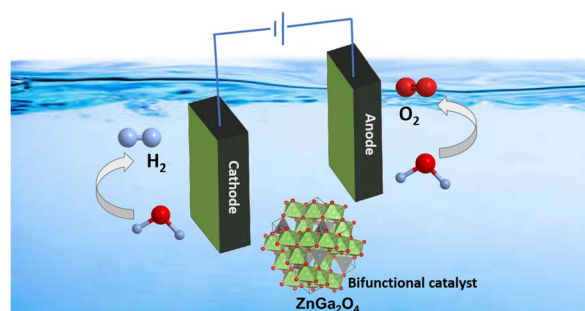


## PAPERS

2144

### Improved catalytic activity on transitioning from inverse to normal spinel in $\text{Zn}_{2-x}\text{Ga}_{2x}\text{Sn}_{1-x}\text{O}_4$ : a robust bifunctional OER and HER electrocatalyst

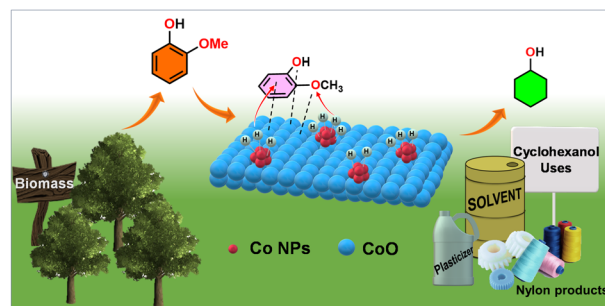
Reshmi T. Parayil, Santosh K. Gupta,\* Kalpana Garg, Shivangi Mehta, K. Sudarshan, M. Mohapatra and Tharamani C. Nagaiah\*



2153

### The cooperative effect of Co and CoO in Co/CoO enabled efficient catalytic hydrogenation and demethoxylation of guaiacol to cyclohexanol

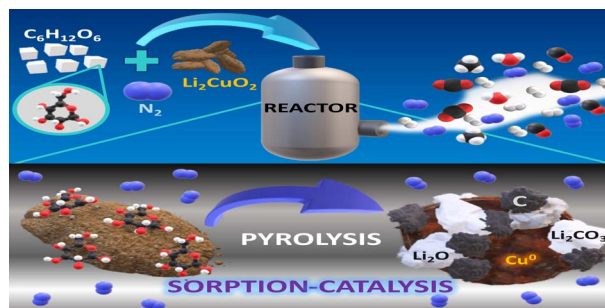
Bhupendra Pratap Singh, Ganesh Sunil More, Rajaram Bal and Rajendra Srivastava\*



2167

### Enhanced $\text{H}_2$ production through biomass pyrolysis by applying alkaline ceramic lithium cuprate ( $\text{Li}_2\text{CuO}_2$ ) as a bifunctional material

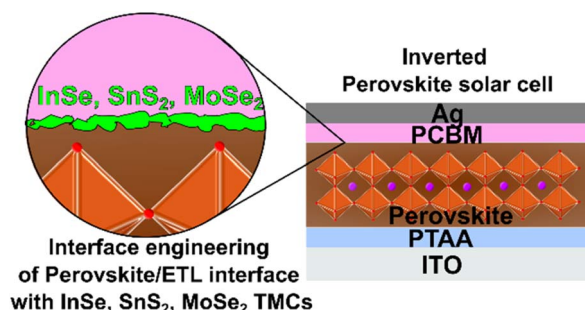
Fernando Plascencia-Hernández, Ana Yañez-Aulestia, Carlos Hernández-Fontes and Heriberto Pfeiffer\*



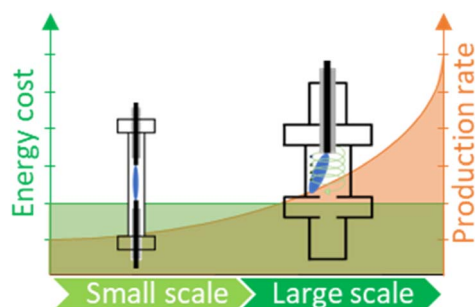
2180

### Engineering of the perovskite/electron-transporting layer interface with transition metal chalcogenides for improving the performance of inverted perovskite solar cells

Dimitris Tsikritzis, Konstantinos Chatzimanolis, Nikolaos Tzoganakis, Konstantinos Rogdakis, Marilena Isabella Zappia, Beatriz Martín-García, Ahmad Bagheri, Hossein Beydaghi, Lukáš Děkanovský, Zdeněk Sofer, Sebastiano Bellani, Francesco Bonaccorso and Emmanuel Kymakis



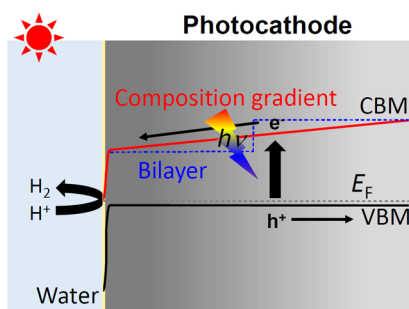
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### Importance of geometric effects in scaling up energy-efficient plasma-based nitrogen fixation

Ivan Tsonev,\* Hamid Ahmadi Eshtehardi,  
Marie-Paule Delplancke and Annemie Bogaerts

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### Efficient hydrogen evolution from water over a thin film photocathode composed of solid solutions with a composition gradient of ZnTe and CdTe

Lionel S. Veiga, Hiromu Kumagai, Masakazu Sugiyama  
and Tsutomu Minegishi\*

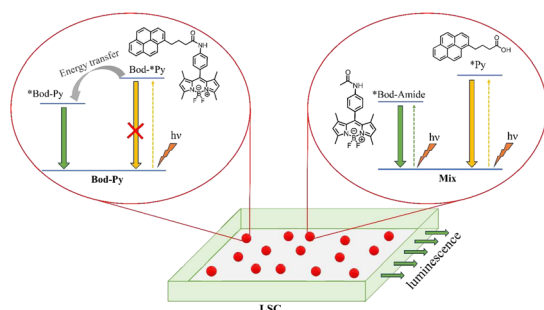
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### A mesoporous Ta<sub>2</sub>O<sub>5</sub>/Nb<sub>2</sub>O<sub>5</sub> nanocomposite with Lewis/Brønsted acid sites to enhance stepwise glucose conversion to 5-hydroxymethylfurfural

Sangeeta Mahala, Senthil Murugan Arumugam, Ravi  
Kumar Kunchala, Bhawana Devi and Sasikumar Elumalai\*

2235



### Comparing a covalently linked BODIPY-pyrene system versus the corresponding physical mixture as chromophores in luminescent solar concentrators

Massimiliano Cordaro, Giulia Neri, Anna Piperno,  
Ambra M. Cancelliere, Antonio Santoro,  
Scolastica Serroni, Francesco Nastasi  
and Antonino Arrigo\*



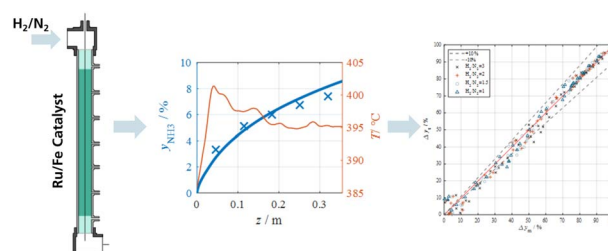


## PAPERS

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# Reaction kinetics for ammonia synthesis using ruthenium and iron based catalysts under low temperature and pressure conditions

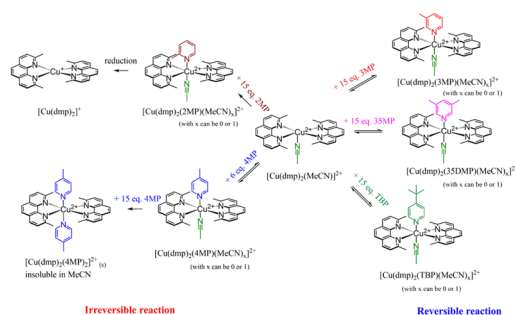
T. Cholewa,\* B. Steinbach, C. Heim, F. Nestler, T. Nanba, R. Güttel\* and O. Salem



2256

# Investigation on the coordination between methylpyridine additives and the [Cu(dmp)<sub>2</sub>]<sup>2+/+</sup> redox couple and its improvement towards the stability of the dye-sensitized solar cells

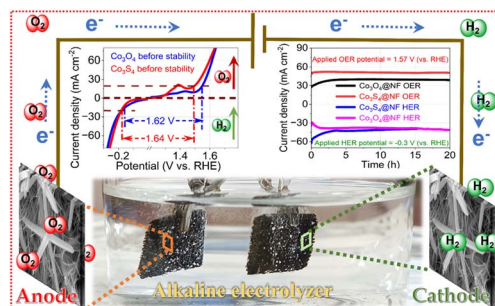
Vinh Son Nguyen, Kala Kannankutty, Yu-Hsuan Chen, Ding-Cheng Wang, Chen-Yu Yeh\* and Tzu-Chien Wei\*



2265

# Enhanced bifunctional electrocatalytic activities of hybrid Co(OH)<sub>2</sub>/MOF-derived materials for green hydrogen production by electrochemical water splitting

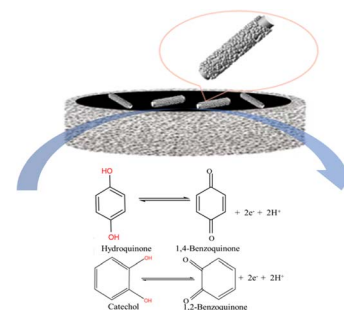
Apurba Borah, Sumit, Sathishkumar Palaniyappan and Gaddam Rajeshkhanna\*



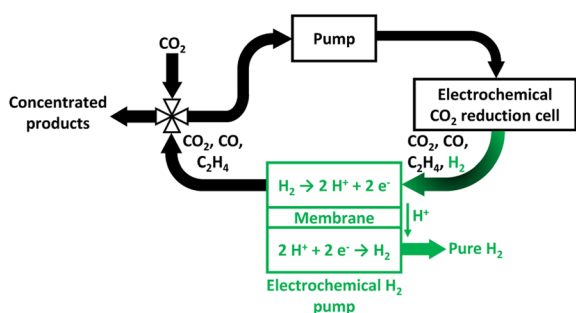
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# Simultaneous detection of hydroquinone and catechol by Cu/Bi-MOF-derived Cu/Bi@C nanocomposites

Yuting Wu, Keru Cao, Jun Yan, Yuheng Zhang, Biao Zhang, Yanan Wang, Yong Yang, Dacheng Zhou, Qi Wang\* and ChunXia Liu\*



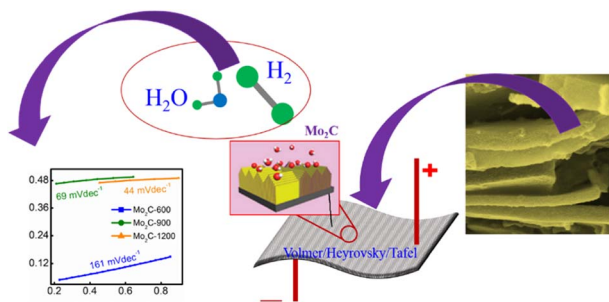
2292



### A recirculation system for concentrating CO<sub>2</sub> electrolyzer products

Tobias A. Kistler, Rajiv Ramanujam Prabhakar and Peter Agbo\*

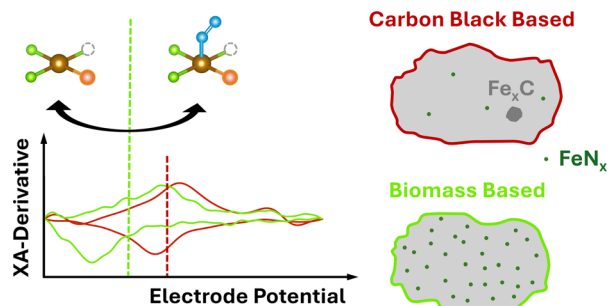
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### Enhancement of the characteristics and HER activity of molybdenum carbide nanosheets for hydrogen evolution reaction

Muhammad Faisal Iqbal, Muhammad Idrees, Muhammad Imran, Aamir Razaq, Guanming Zhu, Jing Zhang,\* Zahir Muhammad\* and Meng Zhang\*

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### Operando X-ray absorption spectroscopy of Fe–N–C catalysts based on carbon black and biomass-derived support materials for the ORR

Garlef Wartner,\* Julia Müller-Hülstede, Hanna Trzesniowski, Michael Wark, Peter Wagner and Robert Seidel\*

