

# Sustainable Energy & Fuels

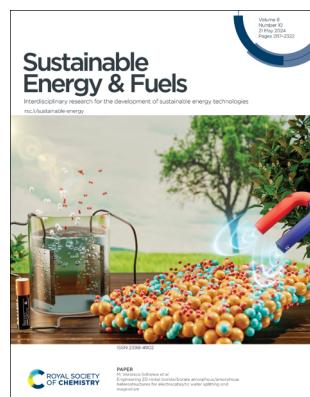
Interdisciplinary research for the development of sustainable energy technologies

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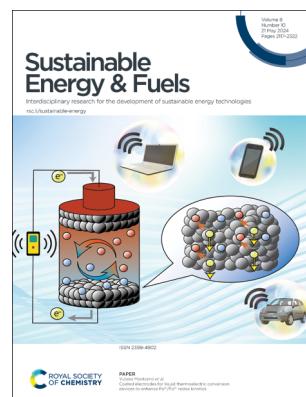
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### Cover

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### 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

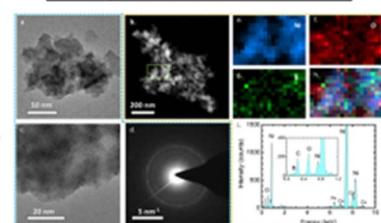
Xu Lin, Vasileios Tzitzios, Qiancheng Zhang, Brian J. Rodriguez, Aran Rafferty, Raman Bekarevich, Michael Pissas and M. Veronica Sofianos\*

#### one-pot chemical reduction method

NaBH<sub>4</sub> and NaOH



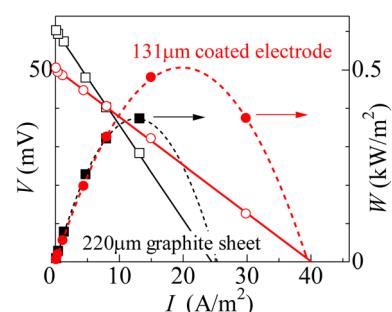
#### amorphous/amorphous nickel boride/borate heterostructures



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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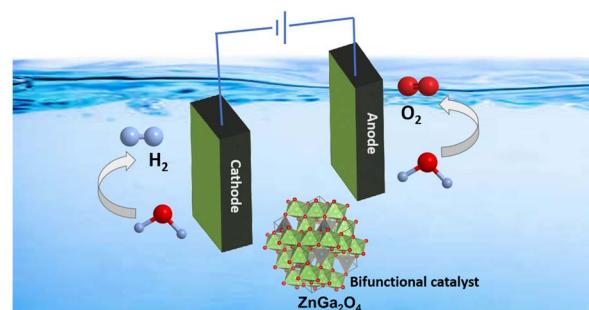


## PAPERS

2144

**Improved catalytic activity on transitioning from inverse to normal spinel in  $Zn_{2-x}Ga_{2x}Sn_{1-x}O_4$ : a robust bifunctional OER and HER electrocatalyst**

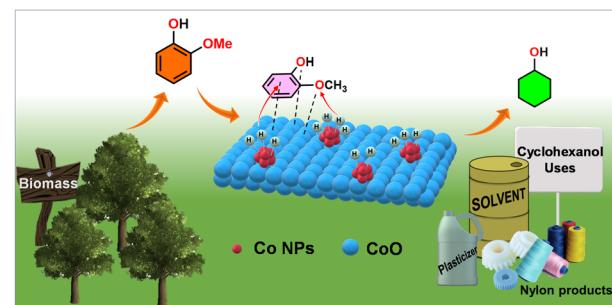
Reshma T. Parayil, Santosh K. Gupta,\* Kalpana Garg, Shivangi Mehta, K. Sudarshan, M. Mohapatra and Tharamani C. Nagaiah\*



2153

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

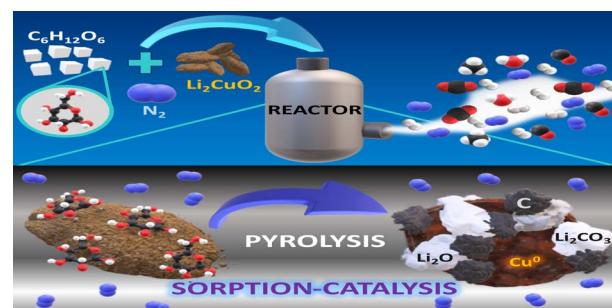
Bhupendra Pratap Singh, Ganesh Sunil More, Rajaram Bal and Rajendra Srivastava\*



2167

**Enhanced H<sub>2</sub> production through biomass pyrolysis by applying alkaline ceramic lithium cuprate (Li<sub>2</sub>CuO<sub>2</sub>) as a bifunctional material**

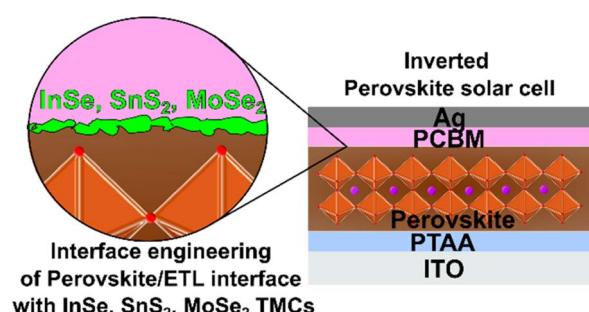
Fernando Plascencia-Hernández, Ana Yañez-Aulestia, Carlos Hernández-Fontes and Heriberto Pfeiffer\*



2180

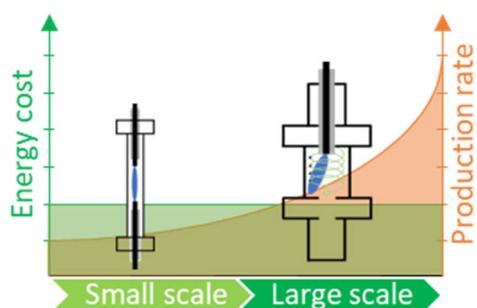
**Engineering of the perovskite/electron-transporting layer interface with transition metal chalcogenides for improving the performance of inverted perovskite solar cells**

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



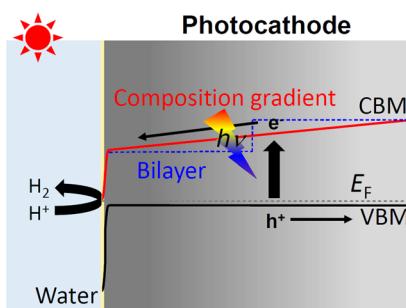
## PAPERS

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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

2210


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

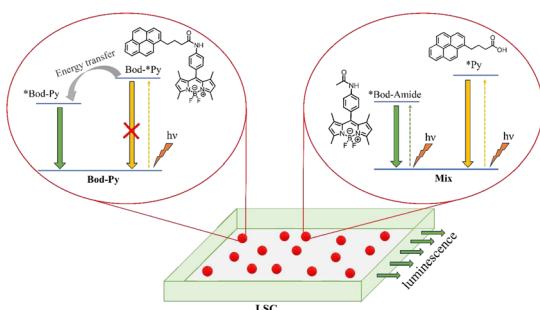
Lionel S. Veiga, Hiromu Kumagai, Masakazu Sugiyama and Tsutomu Minegishi\*

2219


**A mesoporous  $\text{Ta}_2\text{O}_5/\text{Nb}_2\text{O}_5$  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\*

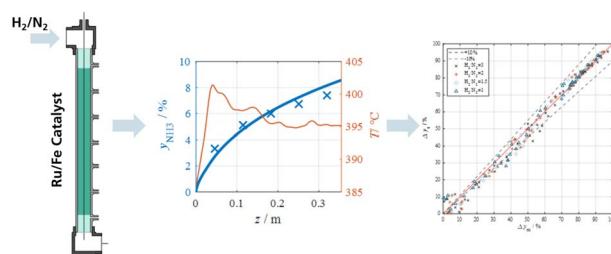


## PAPERS

2245

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

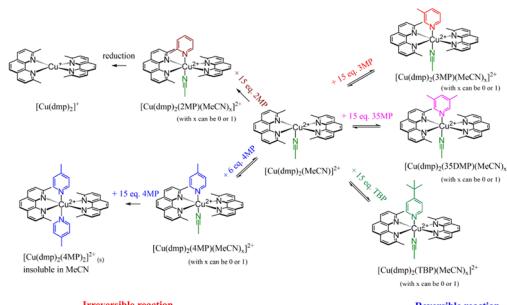
T. Cholewa,\* B. Steinbach, C. Heim, F. Nestler, T. Nanba, R. Gütter\* and O. Salem



2256

## Investigation on the coordination between methylpyridine additives and the $[\text{Cu}(\text{dmp})_2]^{2+/+}$ redox couple and its improvement towards the stability of the dye-sensitized solar cells

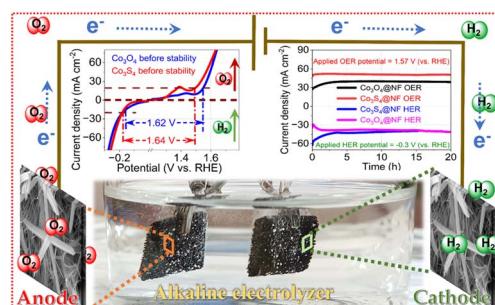
Vinh Son Nguyen, Kala Kannankutty, Yu-Hsuan Chen, Ding-Cheng Wang, Chen-Yu Yeh\* and Tzu-Chien Wei\*



2265

## Enhanced bifunctional electrocatalytic activities of hybrid $\text{Co}(\text{OH})_2/\text{MOF}$ -derived materials for green hydrogen production by electrochemical water splitting

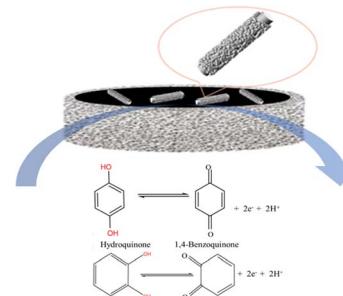
Apurba Borah, Sumit, Sathishkumar Palaniyappan and Gaddam Rajeshkhanna\*



2280

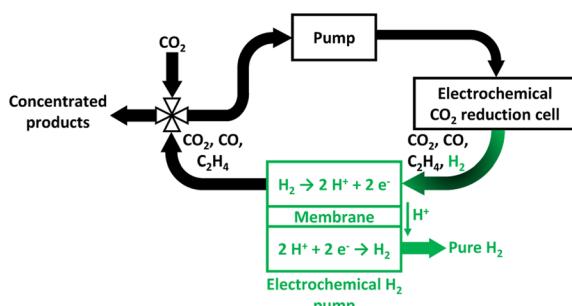
## Simultaneous detection of hydroquinone and catechol by Cu/Bi-MOF-derived Cu/Bi@C nanocomposites

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



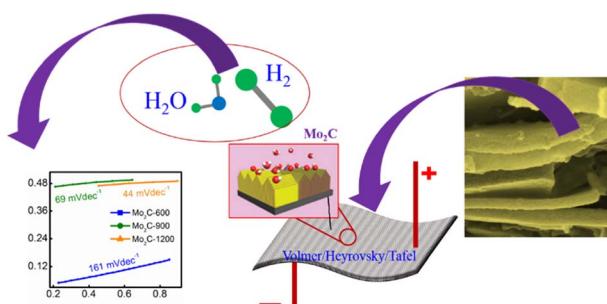
## PAPERS

2292


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

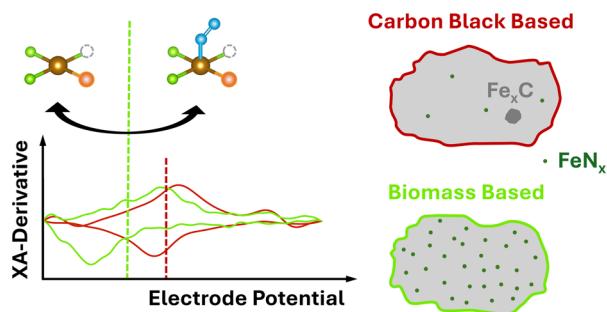
Tobias A. Kistler, Rajiv Ramanujam Prabhakar and Peter Agbo\*

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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-Hülsede, Hanna Trzesniowski, Michael Wark, Peter Wagner and Robert Seidel\*

