

# RSC Sustainability

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## IN THIS ISSUE

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**Cover**  
See Tomonari Tanaka *et al.*, pp. 875–880. Image reproduced by permission of Tomonari Tanaka from *RSC Sustainability.*, 2025, 3, 875.



**Inside cover**  
See Masahiro Goto *et al.*, pp. 881–889. Image reproduced by permission of Masahiro Goto from *RSC Sustainability.*, 2025, 3, 881.

## EDITORIAL

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### Showcasing the technological advancements of carbon dioxide conversion: a pathway to a sustainable future

Xiao Jiang

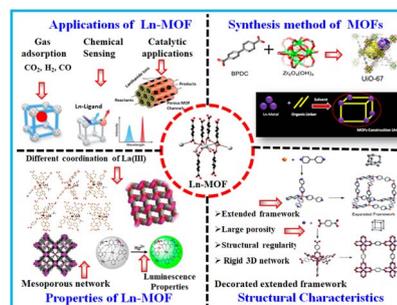


## CRITICAL REVIEWS

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### Lanthanide-based metal–organic frameworks (Ln-MOFs): synthesis, properties and applications

Kankan Patra\* and Haridas Pat\*



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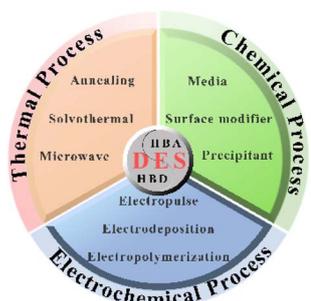
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Fundamental questions  
Elemental answers



738



### A review of designable deep eutectic solvents for green fabrication of advanced functional materials

Zheng Wang, Xinhui Zhao, Yu Chen, Cong Wei\* and Jingyun Jiang\*

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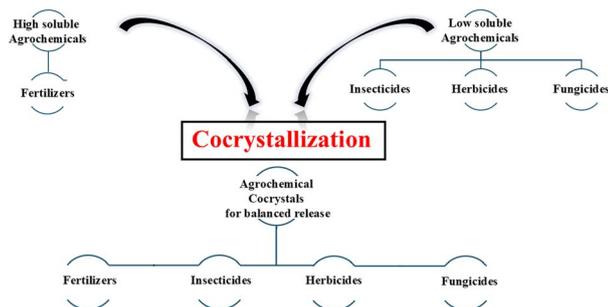


### Electrification of fertilizer production via plasma-based nitrogen fixation: a tutorial on fundamentals

Mikhail Gromov,\* Yury Gorbanev, Elise Vervloessem, Rino Morent, Rony Snyders, Nathalie De Geyter, Annemie Bogaerts and Anton Nikiforov

## PERSPECTIVES

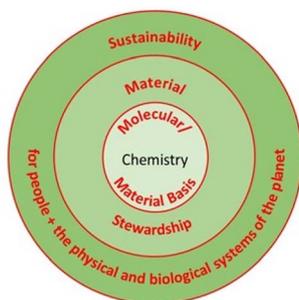
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### Sustainable by (crystal) design: novel materials for agriculture via active ingredient cocrystallization

Mohamed Ammar, Sherif Ashraf, Diego Alexander Gonzalez-Casamachin and Jonas Baltrusaitis\*

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### MATERIAL STEWARDSHIP Attention to:

- stocks and flows of ALL elements in the Periodic Table
- Sustainability Frameworks and tools
- Chemistry orientations and movements

### Inventing a secure future: material stewardship as chemistry's mission for sustainability

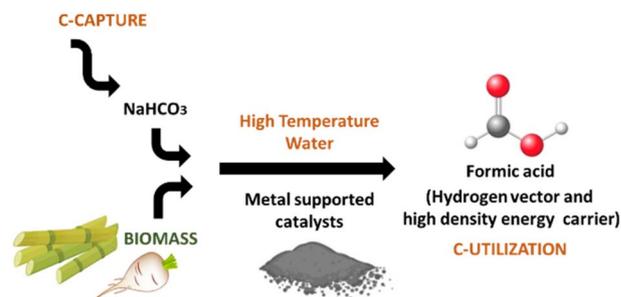
Stephen A. Matlin,\* Sarah E. Cornell, Klaus Kümmerer, Peter G. Mahaffy and Goverdhan Mehta



822

### Reduction of CO<sub>2</sub> captured in basic solutions with biomass as reducing agent and metallic catalysts

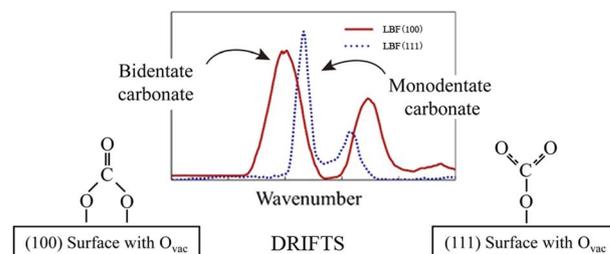
Maira I. Chinchilla, Ángel Martín, J. McGregor, Fidel A. Mato and María D. Bermejo\*



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### Role of SiO<sub>2</sub> in enhancing CO yield by using silica-supported La<sub>0.5</sub>Ba<sub>0.5</sub>FeO<sub>3</sub> in reverse water–gas shift chemical looping

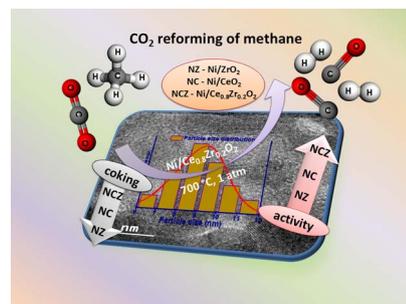
Hanzhong Shi, Jiawei Guo, Prabhsimran Singh, Venkat R. Bhethanabotla\* and John N. Kuhn\*



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### Ni/Ce<sub>0.8</sub>Zr<sub>0.2</sub>O<sub>2-x</sub> solid solution catalyst: a pathway to coke-resistant CO<sub>2</sub> reforming of methane

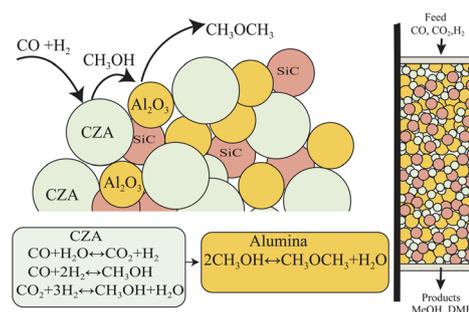
Rubina Khatun, Rohan Singh Pal, Kapil Bhati, Anil Chandra Kothari, Shivani Singh, Nazia Siddiqui, Swati Rana and Rajaram Bal\*



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### Multiscale characterization, modeling and simulation of packed bed reactor for direct conversion of syngas to dimethyl ether

Ginu R. George, Adam Yonge, Meagan F. Crowley, Anh T. To, Peter N. Ciesielski\* and Canan Karakaya\*



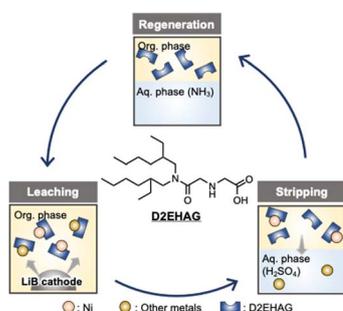
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### Exploration of lignin-binding synthetic polymers with pendant hydrophobic amino acids

Tomonari Tanaka,\* Rika Hinohara, Oscar Abraham Carias Duron, Yuji Aso, Naoko Kobayashi, Kaori Saito and Takashi Watanabe

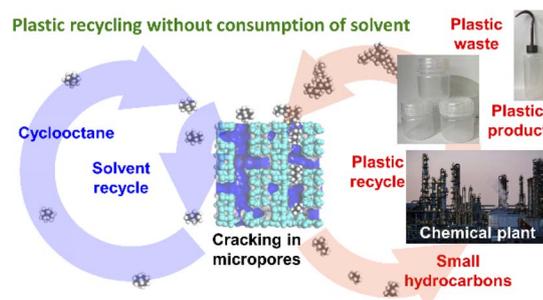
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### Non-aqueous direct leaching using a reusable nickel-selective amic-acid extractant for efficient lithium-ion battery recycling

Takejiro Matsui, Takafumi Hanada and Masahiro Goto\*

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### Shape selective cracking of polypropylene on an H-MFI type zeolite catalyst with recovery of cyclooctane solvent

Tomohiro Fukumasa, Yuya Kawatani, Hiroki Masuda, Ikuto Nakashita, Ryusei Hashiguchi, Masanori Takemoto, Satoshi Suganuma, Etsushi Tsuji, Toru Wakaiharu and Naonobu Katada\*

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### Enhanced dye removal and supercapacitor performance of polyethyleneimine-impregnated activated carbon derived from local eucalyptus biochar

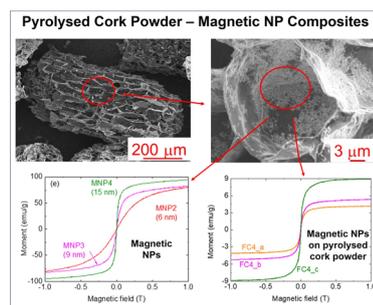
Bordin Weerasuk, Threeraphat Chutimasakul, Nicha Prigyai and Tanagorn Sangtawesin\*



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## Cork-derived magnetic composites: a preliminary study

Francesca Scalera, Anna Grazia Monteduro, Alessandra Quarta, Annalisa Caputo, Robert C. Pullar, Giuseppe Maruccio and Clara Piccirillo\*



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## Carbon emission reduction strategy planning and scheduling for transitioning process plants towards net-zero emissions

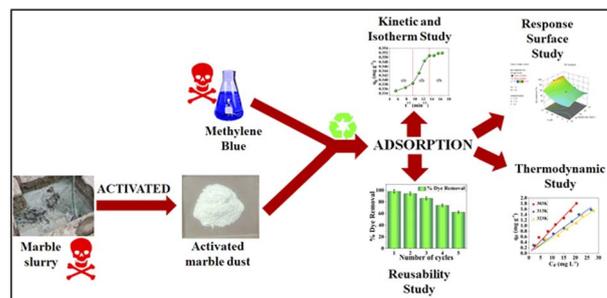
Yuen Xiu Lye, Yick Eu Chew, Dominic C. Y. Foo, Bing Shen How and Viknesh Andiappan\*



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## Repurposed marble dust as a promising adsorbent for modelling the removal of methylene blue from aqueous solutions

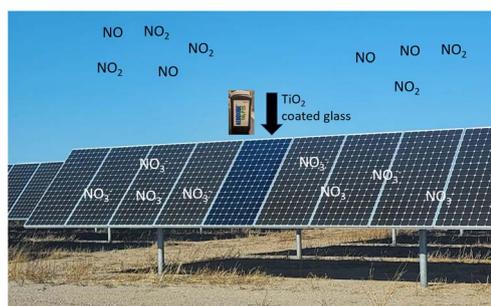
Ankita Sharma, Subrata Panda, Sudesh Kumar and Yogesh Chandra Sharma\*



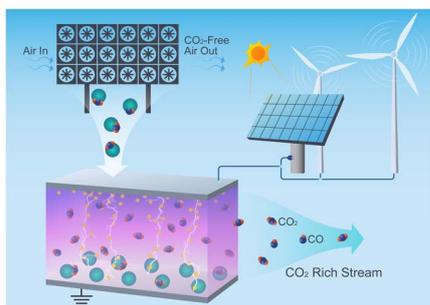
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## Photocatalytic abatement of ambient NO<sub>x</sub> by TiO<sub>2</sub> coated solar panels

Jesse Molar, Pierre Herckes\* and Matthew P. Fraser



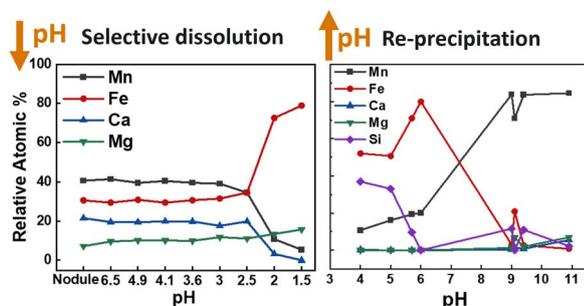
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### Cold plasma activated CO<sub>2</sub> desorption from calcium carbonate for carbon capture

Hongtao Zhong,<sup>\*</sup> Daniel Piriaei, Gennaro Liccardo, Jieun Kang, Benjamin Wang, Matteo Cargnello and Mark A. Cappelli

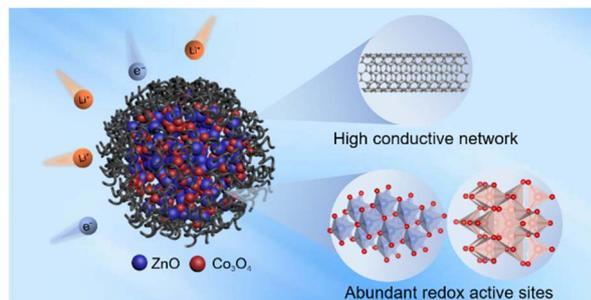
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### Selective dissolution and re-precipitation by pH cycling enables recovery of manganese from surface nodules

Pravalika Butreddy, Sebastian T. Mergelsberg, Jennifer N. Jocz, Dongsheng Li, Venkateshkumar Prabhakaran, Andrew J. Ritchhart, Chinmayee V. Subban, Jon Kellar, Scott R. Beeler, Sarah W. Keenan<sup>\*</sup> and Elias Nakouzi<sup>\*</sup>

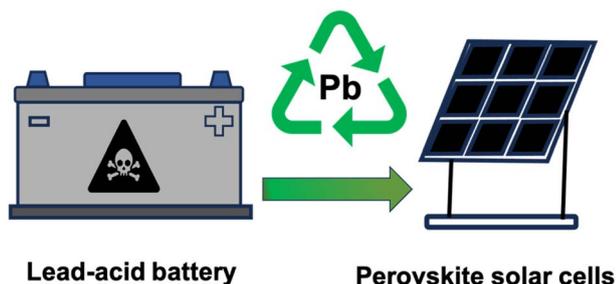
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### ZnO/Co<sub>3</sub>O<sub>4</sub> supported on carbon nanotubes as anode materials for high-performance lithium-ion batteries

Songli Qiu, Jiafeng Wu, Liyu Chen<sup>\*</sup> and Yingwei Li<sup>\*</sup>

1003



### From lead–acid batteries to perovskite solar cells – efficient recycling of Pb-containing materials

Jiajia Suo,<sup>\*</sup> Bowen Yang, Sonja Prideaux, Henrik Pettersson and Lars Kloo

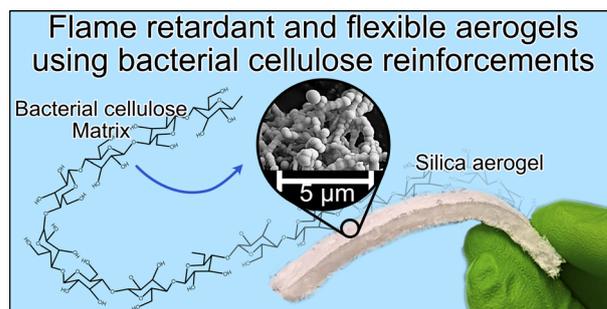


## PAPERS

1009

**Flexible fire-safe hybrid organic–inorganic cellulose aerogels from sol–gel casting**

Björn K. Birdsong, Antonio J. Capezza, Rhoda Afriyie Mensah, Patric Elf, Mikael S. Hedenqvist, Fritjof Nilsson\* and Richard T. Olsson\*



## CORRECTION

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**Correction: Shape selective cracking of polypropylene on an H-MFI type zeolite catalyst with recovery of cyclooctane solvent**

Tomohiro Fukumasa, Yuya Kawatani, Hiroki Masuda, Ikuto Nakashita, Ryusei Hashiguchi, Masanori Takemoto, Satoshi Suganuma, Etsushi Tsuji, Toru Wakihara and Naonobu Katada\*

