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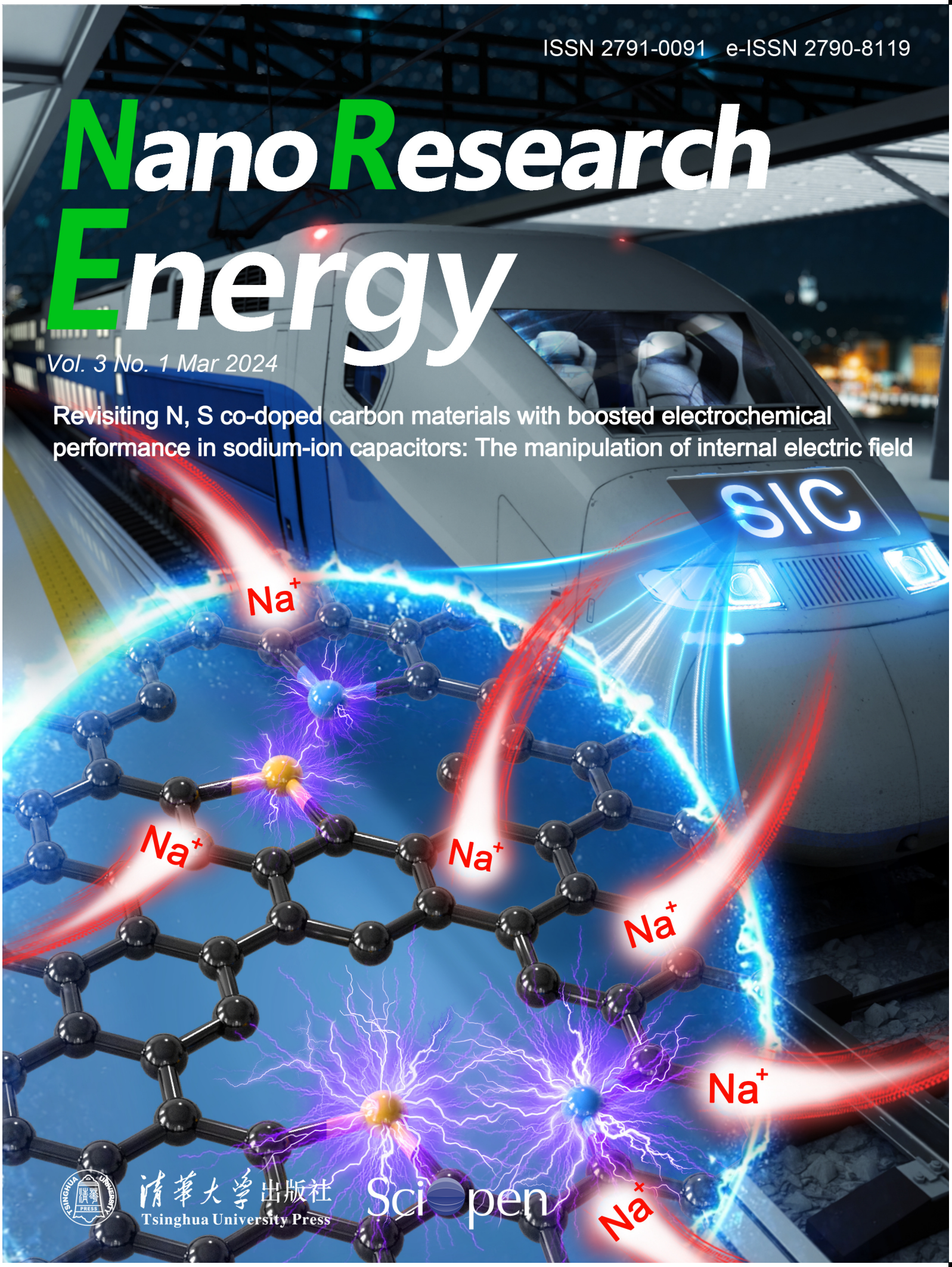
Revisiting N, S co-doped carbon materials with boosted electrochemical performance in sodium-ion capacitors: The manipulation of internal electric field



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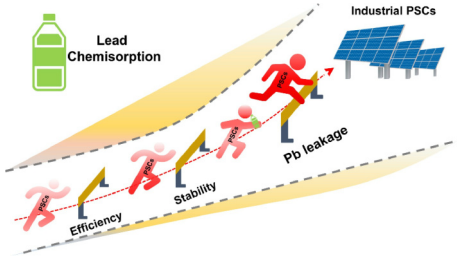
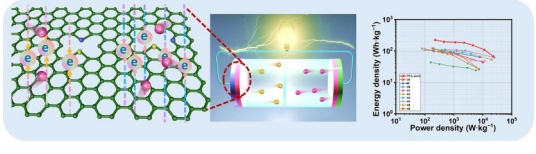


This perspective provides a comprehensive overview of recent advancements in Pb chemisorption in PSCs and discusses the prospects for future developments and challenges in this field.

Research Articles

Front Cover



The presence of both pyridinic and pyrrolic nitrogen atoms in the S, N co-doped carbon matrix (S-N-CBFs) generates internal electric fields, synergistically interacting with the doped sulfur atom. This interaction directly impacts the adsorption of sodium ions, ultimately leading to the remarkable performance enhancement in sodium storage.

Polymer donors with hydrophilic side-chains enabling efficient and thermally-stable polymer solar cells by non-halogenated solvent processing

Soodeok Seo[1], Jun-Young Park[2], Jin Su Park[1], Seungjin Lee[3], Do-Yeong Choi[2], Yun-Hi Kim[2,*], and Bumjoon J. Kim[1,*]

[1] Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea
[2] Gyeongsang National University, Republic of Korea
[3] Korea Research Institute of Chemical Technology (KRICT), Republic of Korea

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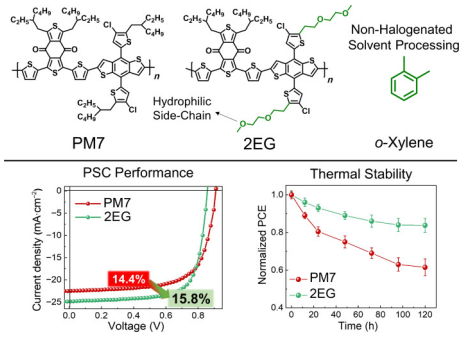

New polymer donor (2EG) featuring hydrophilic oligoethylene glycol (OEG) sidechain is designed to achieve a high-performance and thermally-stable polymer solar cells (PSCs) by non-halogenated solvent process.

Dissociation of singlet excitons dominates photocurrent improvement in high-efficiency non-fullerene organic solar cells

Qicong Li[1,2], Shizhong Yue[1], Zhitao Huang[1], Chao Li[1], Jiaqian Sun[1], Keqian Dong[1], Zhijie Wang[1,*], Kong Liu[1,*], Shengchun Qu[1,*], and Yong Lei[3,*]

[1] Institute of Semiconductors, Chinese Academy of Sciences, China
[2] China Electronics Standardization Institution, China
[3] Technische Universität Ilmenau, Germany

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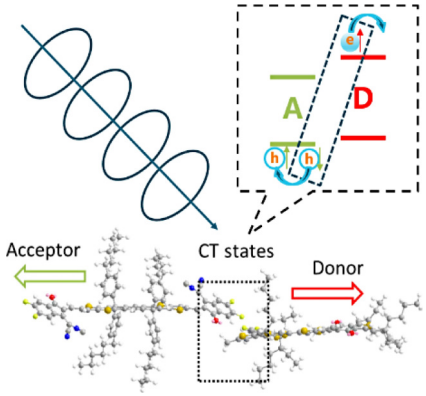

Increasing the ratio of singlet excitons in high-efficiency non-fullerene organic solar cells enhances the photocurrent.

Review Articles

Back Cover

How to select heterogeneous CO_2 reduction electrocatalyst

Ji Shen and Dingsheng Wang*

Tsinghua University, China

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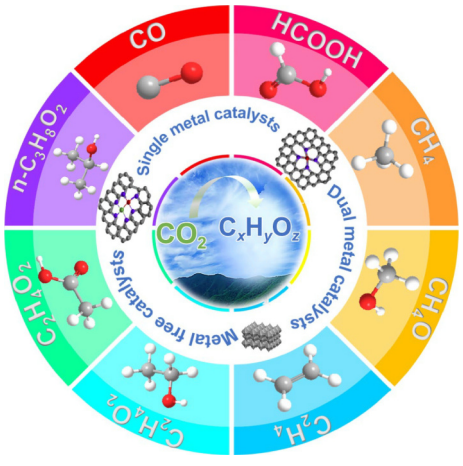
https://doi.org/10.26599/NRE.2023.9120096



It plays a very important role by exploring the element type and surface structure of the catalyst in improving the targeted conversion of CO_2 into C_1 and C_{2+} products.

Research progress of transition metal compounds as bifunctional catalysts for zinc-air batteries

Yan Ran[1], Changfan Xu[1], Deyang Ji[2], Huaping Zhao[1], Liqiang Li[2], and Yong Lei[1,*]

[1] Technische Universität Ilmenau, Germany
[2] Tianjin University, China

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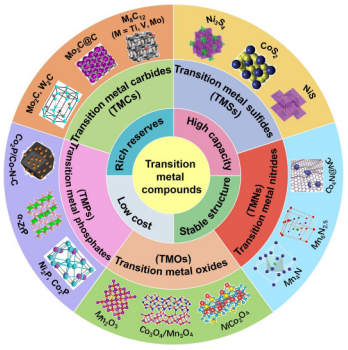

It is of great significance to develop efficient, stable, and environmentally friendly bifunctional catalysts in zinc-air batteries (ZABs). This review aims to report the latest research progress on the transition metal compounds as bifunctional catalysts as cathode materials for zinc-air batteries promptly, hoping to provide a reference value for future research in this field.

Recent advances in structural modification on graphitic carbon nitride (g-C_3N_4)-based photocatalysts for high-efficiency photocatalytic H_2O_2 production

Feng Ming Yap[1], Grayson Zhi Sheng Ling[1], Brenden Jing Su[1], Jian Yiing Loh[1], and Wee-Jun Ong[1,2,3,*]

[1] Xiamen University Malaysia, Malaysia
[2] Xiamen University, China
[3] Shenzhen Research Institute of Xiamen University, China

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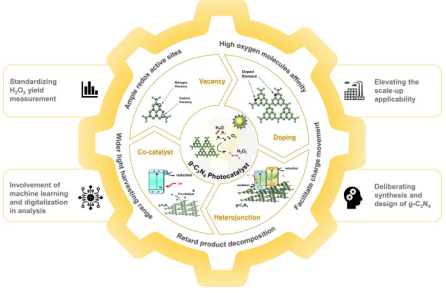

The development of g-C_3N_4-based semiconductors for photocatalytic H_2O_2 generation has emerged as a promising alternative to the energy-intensive and wasteful anthraquinone process. Through modifications such as vacancy introduction, doping, heterogenization, and co-catalyst passivation, g-C_3N_4 photocatalysts show potential for high-efficiency H_2O_2 production via ORR and WOR reactions, paving the way for a greener and more sustainable future.

From lab to market: a review of commercialization and advances for binders in lithium-, zinc-, sodium-ion batteries

Chang Su[1], Xuan Gao[2], Kejiang Liu[3], Yuhang Dai[2], Haobo Dong[2], Yiyang Liu[2], Jiayan Zhu[4], Qiuxia Zhang[4], Hongzhen He[2], and Guanjie He[2,*]

[1] ETH Zürich, Switzerland
[2] University College London, UK
[3] Hong Kong Baptist University, China
[4] Jilin University, China

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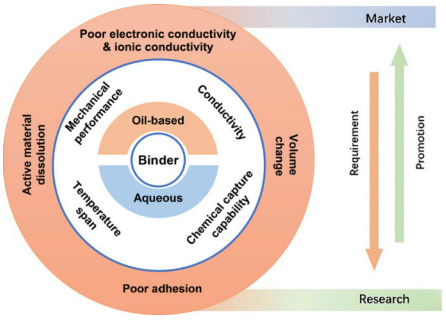

In the process of commercialization, the development of the energy storage market continues to demand scientific research, and the emergence of the new binder further expands the development of energy storage market. The demand matrix is formed by the continuous improvement of mechanical properties, temperature span, electronic & ionic conductivity, and volume changes of next generation binders.

Colloidal quantum dot for infrared-absorbing solar cells: State-of-the-art and prospects

Siyu Zheng[1], Xinyi Mei[1], Jingxuan Chen[1], Erik M. J. Johansson[2], and Xiaoliang Zhang[1,*]

[1] Beihang University, China
[2] Uppsala University, Sweden

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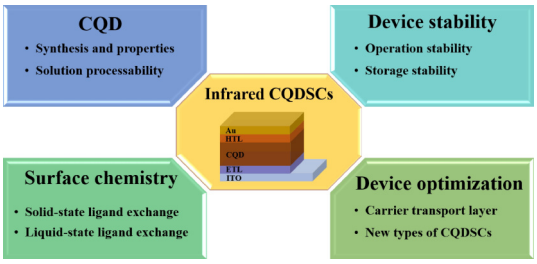

This review comprehensively summarizes the latest advances, challenges, and opportunities of the colloidal quantum dots for infrared-absorbing solar cells.

Quinoidal conjugated materials: Design strategies and thermoelectric applications

Runshi Wu[1,2], Dafei Yuan[3,*], and Xiaozhang Zhu[1,2,*]

[1] Institute of Chemistry, Chinese Academy of Sciences, China
[2] University of Chinese Academy of Sciences, China
[3] Hunan University, China

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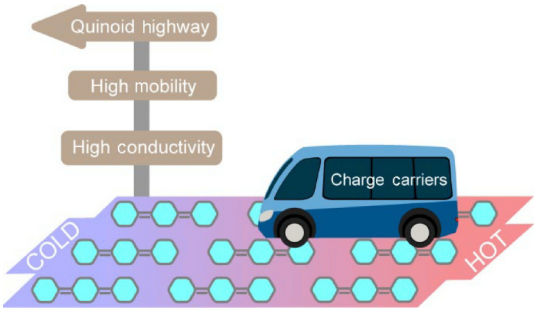

This perspective focuses on the current developments of quinoidal conjugated materials and their typical applications in thermoelectric devices.

AIMS & SCOPE

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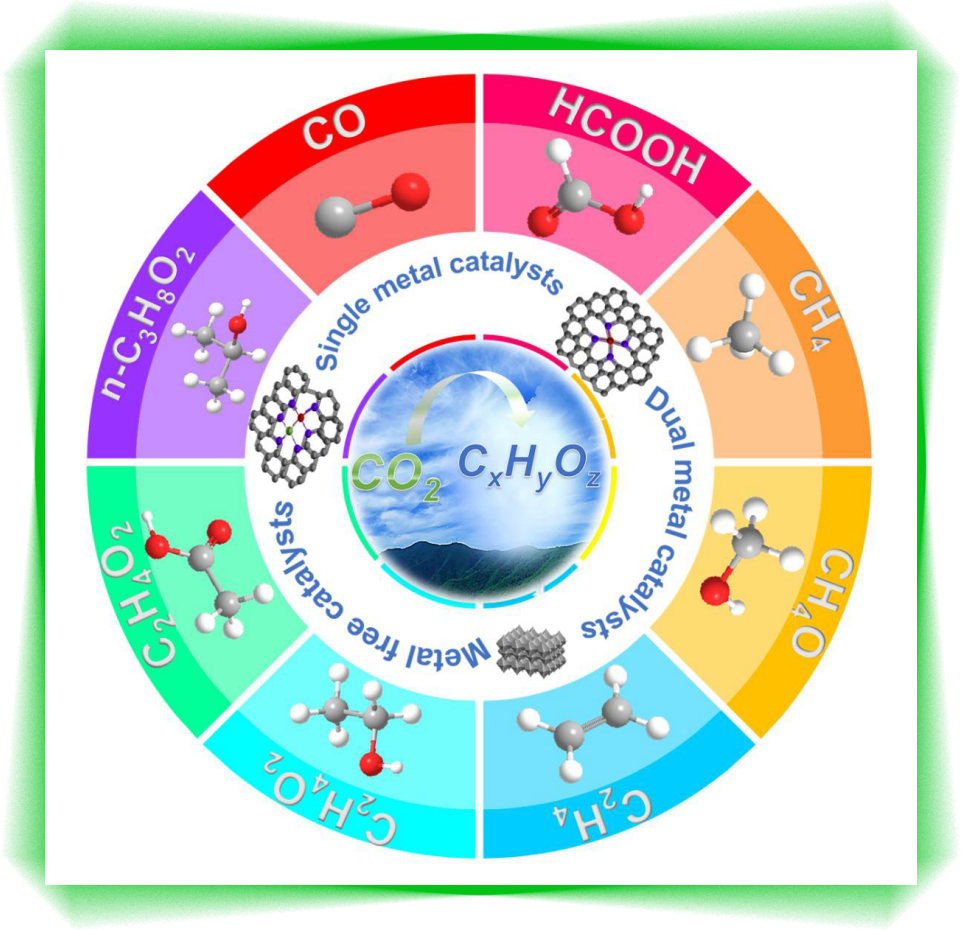

How to select heterogeneous CO_2 reduction electrocatalyst

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