



Carbon Future

● Carbon-neutral skies

CO₂-to-aviation fuel 9200010

Role of nitrogen dopants in catalysis 9200008

Fullerene-metalloporphyrin for zinc-air battery 9200009

P-modified carbon 9200012

CO₂ electroreduction 9200013



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Perspective

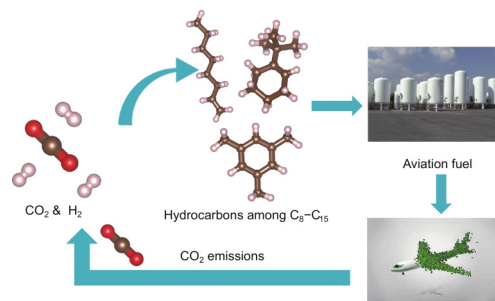
Fueling the future: Innovating the path to carbon-neutral skies with CO₂-to-aviation fuel

This work reviews some innovative approaches to achieving carbon neutrality in aviation by converting CO₂ to sustainable aviation fuel (SAF), assessing the feasibility of current CO₂-to-jet fuel conversion methodologies and their potential environmental and economic impacts.

Guo Tian, Chenxi Zhang*, and Fei Wei*

Carbon Future, **2024**, 1, 9200010

<https://doi.org/10.26599/CF.2024.9200010>



Research articles

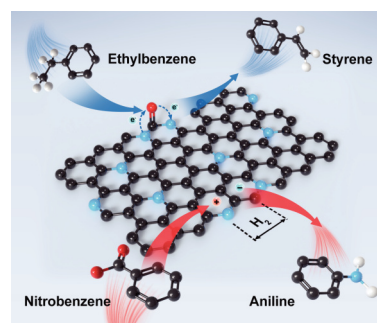
Identification of role of nitrogen dopants in nanocarbon catalysis

Two-dimensional nitrogen-doped nanocarbons (NCs) with variable types and contents of nitrogen but constant oxygen species are constructed for oxidative dehydrogenation of ethylbenzene and nitrobenzene hydrogenation reaction. The NC-1000 and NC-850 catalysts exhibit ultra-high catalytic activities, and the active site and nitrogen function mechanism are elucidated by correlating kinetic measurements, structure information, and DFT calculations.

Xuefei Zhang, Xinying Lin, Xiaoyan Huang, Yiquan Chen, Sen Lin, Xing Huang, and Zailai Xie*

Carbon Future, **2024**, 1, 9200008

<https://doi.org/10.26599/CF.2024.9200008>



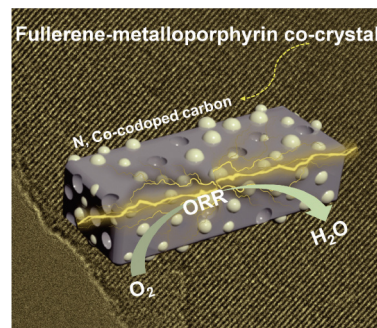
Fullerene-metalloporphyrin co-crystal as efficient oxygen reduction reaction electrocatalyst precursor for Zn-air batteries

A self-assembled fullerene-metalloporphyrin co-crystal used as a precursor enables efficient ORR by redistributing N and Co atoms on a carbon substrate at high temperature.

Ao Yu, Qi Huang, Shixin Gao, Tingting Xu, Wei Zhang, Nimanyu Joshi, Ping Peng*, Yang Yang*, and Fang-Fang Li*

Carbon Future, **2024**, 1, 9200009

<https://doi.org/10.26599/CF.2024.9200009>



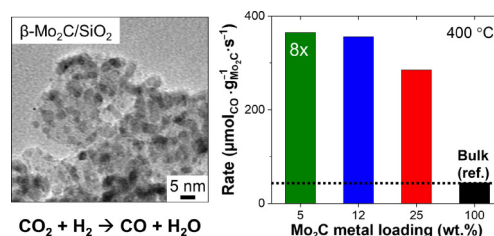
Valorization of carbon dioxide into C1 product via reverse water gas shift reaction using oxide-supported molybdenum carbides

Silica-supported nanometer-sized molybdenum carbide catalyst is applied to the valorization of carbon dioxide, achieving a high mass activity of $372 \mu\text{mol}_{\text{CO}_2} \cdot \text{g}_{\text{Mo}_2\text{C}}^{-1} \cdot \text{s}^{-1}$ at 400 °C and $1109 \mu\text{mol}_{\text{CO}_2} \cdot \text{g}_{\text{Mo}_2\text{C}}^{-1} \cdot \text{s}^{-1}$ at 600 °C.

Andrew N. Kuhn, Rachel C. Park, Siying Yu, Di Gao, Cheng Zhang, Yuanhui Zhang, and Hong Yang*

Carbon Future, **2024**, 1, 9200011

<https://doi.org/10.26599/CF.2024.9200011>



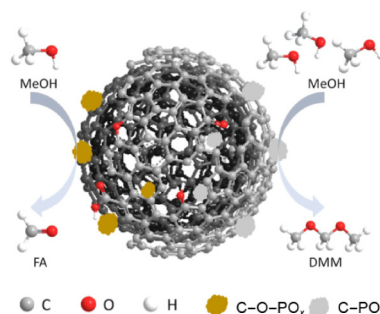
Phosphorus modified onion-like carbon catalyzed methanol conversion to dimethoxymethane: The unique role of C–P species

Efficient one-step synthesis of dimethoxymethane (DMM) from methanol was achieved over nonmetallic P-modified nanocarbon materials, in which C–P species were found as the key factor for high DMM formation rate.

Xueya Dai, Pengqiang Yan, Yunli Bai, Miao Guo, and Wei Qi*

Carbon Future, **2024**, 1, 9200012

<https://doi.org/10.26599/CF.2024.9200012>



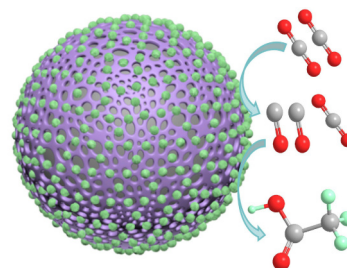
CO₂ electroreduction to acetate by enhanced tandem effects of surface intermediate over Co₃O₄ supported polyaniline catalyst

We report a heterogeneous catalyst with Co₃O₄ nanoparticles immobilized on polyaniline (PANI) and co-supported by highly graphitized carbon (Co₃O₄/PANI/C) for electroreduction of CO₂ to acetate with high activity and selectivity. Its excellent performance is attributed to the tandem effects between the Co₃O₄ nanoparticles with abundant oxygen vacancy and the PANI heterogeneous interface in a favorable configuration.

Liwen Wang, Pengfei Liu, Jie Yang, Chenjia Liang, Changshun Deng, Yinxuan Zhao, Xuefeng Guo, Luming Peng, Nianhua Xue, Qiang Wang*, and Weiping Ding*

Carbon Future, **2024**, 1, 9200013

<https://doi.org/10.26599/CF.2024.9200013>



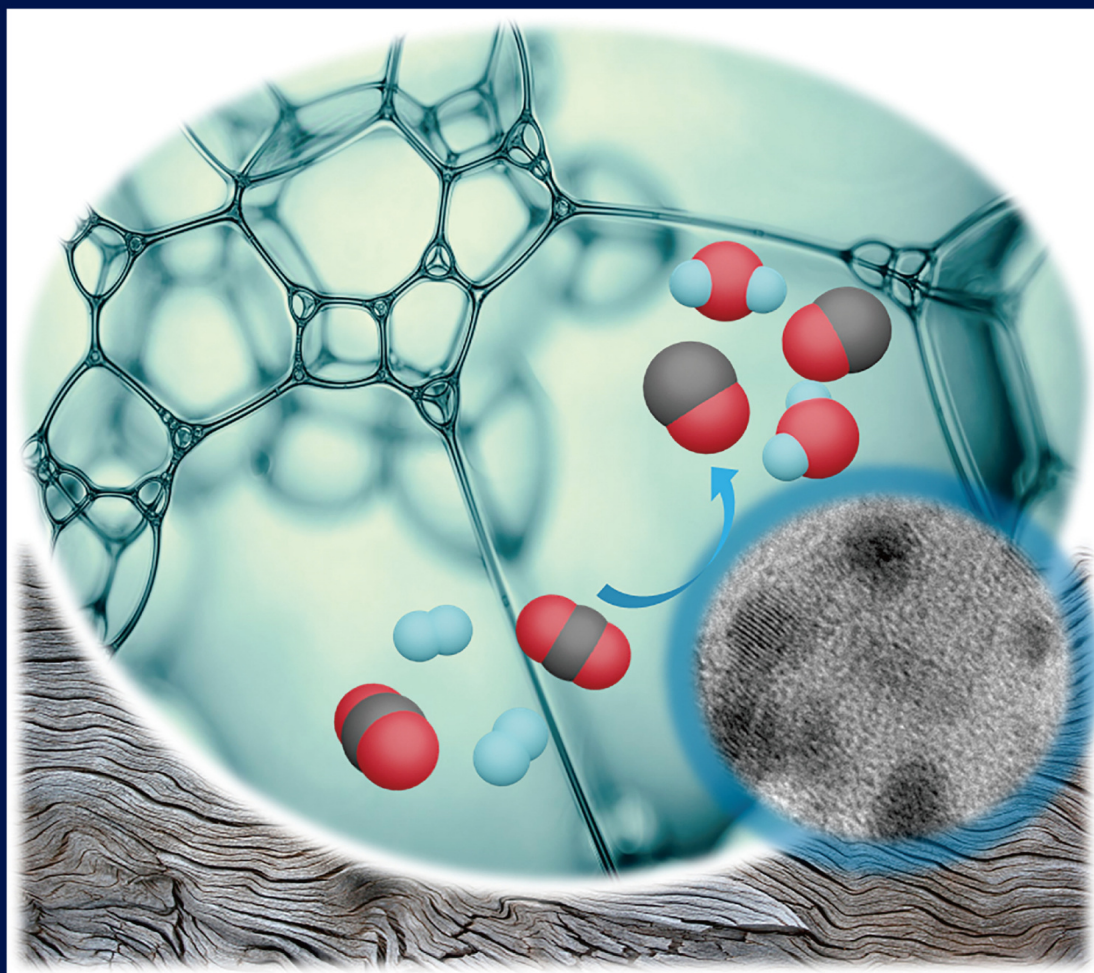
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