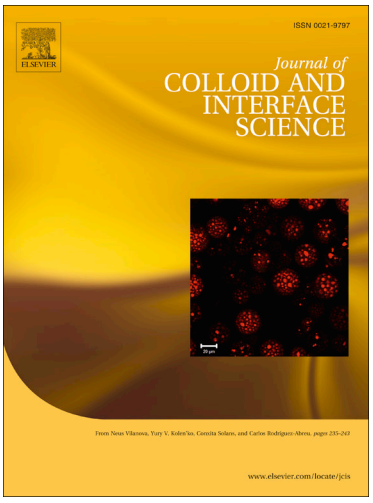

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Biomass based iron and nitrogen co-doped 3D porous carbon as an efficient oxygen reduction catalyst

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Abstract

An iron and nitrogen co-doped 3D porous carbon catalyst with high performance for oxygen reduction reaction (ORR) is produced by pyrolysis. The precursor is a mixture of red date, ferrous (Ⅱ) acetate, and graphitic carbon nitride (g-C_3N_4). g-C_3N_4 is the nitrogen source and also the sacrificial template, which plays a key role in the formation of a porous nitrogen rich carbon structure with high surface area. It is found that active sites and catalytic performance of synthetic materials are significantly influenced by the Fe content. In comparison with commercial Pt/C catalyst, the synthetic Fe-N-C with optimized composition exhibits comparable ORR activity and superior methanol tolerance. This work provides a feasible approach to develop cost-effective and highly efficient non-precious metal electrochemical catalysts for oxygen reduction.

Key words: Non-precious metal catalyst; Iron and nitrogen co-doped carbon; g-C_3N_4; Oxygen reduction reaction

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