DUAL METAL Mn/Co-MOF BASED HIGH-PERFORMANCE BIFUNCTIONAL OXYGEN ELECTROCATALYST

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The oxygen reduction reaction (ORR) and oxygen evolution reaction (OER) are vital electrochemical processes for energy conversion and storage in fuel cells and metal-air batteries. Efficient and low-cost catalysts are needed to improve the kinetics and reduce the overpotential of these reactions. Metal-organic framework (MOF)-based catalysts have been extensively explored for ORR and OER due to their tunable porosity, high surface area, and excellent stability.

In this study, we report the novel MnOx/Co-N-C catalyst synthesized from a dual metal Mn/Co-MOF precursor (TAL-42). The optimized MnOx/Co-N-C catalysts exhibited remarkable bifunctional electrocatalytic activity towards ORR and OER in alkaline media which was superior to commercial Pt/C and RuO_2 catalysts. Moreover, the catalyst showed remarkable durability during charge and discharge in a practical zinc-air battery (ZAB) with high power density in an alkaline aqueous solution. The TAL-42-derived catalysts developed in this study have the potential to be employed in various energy conversion and storage technologies.

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