Bimetallic Zeolitic Imidazolate Framework-derived Porous Carbon as Efficient Bifunctional Electrocatalysts for Zn-air Battery

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The development of low-cost and efficient oxygen reduction reaction (ORR) and oxygen evolution reaction (OER) electrocatalyst is critical for widespread application of fuel cells and metal-air batteries. Herein, hierarchically structured porous carbon bifunctional electrocatalyst is synthesized by using soft template and metal organic framework (MOF) precursor. The as-obtained electrocatalyst exhibits superior catalytic activity due to its hierarchical porous architecture as well as high surface area ($1539 \text{ m}^2 \text{ g}^{-1}$). For ORR, the prepared catalyst shows more positive activity, superior long-term stability and remarkable methanol tolerance compared with commercial Pt/C catalyst in alkaline condition. In addition, the reported catalyst also has a higher OER activity than commercial Pt/C catalyst in alkaline media. We further demonstrate that the catalyst also presents outstanding Zn-air battery performance.

Keywords: Metal organic framework, soft template, oxygen reduction reaction, oxygen evolution reaction; Zn-air battery

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