

Synthesis of Mo doped Zr-MOF(UiO-67) as stable and efficient electrocatalyst support for electrochemical reactions

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Development of highly active and durable electrocatalysts for efficient oxygen reduction reaction (ORR) remains important challenge for high-performance electrochemical conversion and storage applications such as fuel cells and metal-air batteries. Doping with a transition metal was recently shown to greatly boost the activity and durability of Pt based electrocatalysts for the ORR or hydrogen evolution reaction (HER). Molybdenum phosphide exhibits high activity towards the HER in both acid and alkaline media even in bulk form. UiO-67 is a Zr-based oxide MOF which can provide the O-vacancy required for the reverse water gas shift reaction and can be used as a support for highly dispersed nanostructured catalysts to prevent nanoparticles from sintering and aggregation at high temperature, maintaining its catalyst activity. In this study, we synthesized Mo doped UiO-67 using microwave oven synthesis method as efficient and stable electrocatalyst support, followed by Pt impregnation for hydrogen evolution reaction or oxygen reduction reaction. The synthesized catalysts were analyzed by BET, XRD, FE-SEM and electrochemical experiment.