

Facile synthesis of atomically dispersed hollow Co-N-C spherical particles and their oxygen reduction activity for PEMFC

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metal-nitrogen-carbon (M-N-C) catalysts have been reported as a promising electrocatalyst for proton exchange membrane fuel cell (PEMFCs) to replace noble metal catalysts (Pt/C, Au/C, and Ru/C, etc.). Although many studies have been reported that M-N-C catalysts have better performance than Pt catalysts, but most have been reported in alkaline media, and Fe-N-C catalysts have been mainly studied in acidic media. Fe-N-C catalysts have excellent ORR performance; the new M-N-C catalyst should be replaced as it is less stable due to the Fenton reaction. In this study, Co-N-C hollow particles were synthesized using cobalt, which was less affected by the Fenton reaction, and ORR was performed on acidic media. Since it was synthesized by the spray pyrolysis method, mass production was possible and a uniform catalyst could be synthesized, and a half-wave potential of 0.79 V was obtained versus the hydrogen electrode.