Uniform, nitrogen and sulfur codoped carbon nanospheres for oxygen reduction reaction application
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S and N co-doped nanospheres, with uniform spherical size and distribution, were prepared by using polyacrylonitrile and sulfur as precursors. The catalysts were characterized intensively by scanning electron microscope (SEM), high resolution transmission microscope (HRTEM) and X-ray photoelectron spectroscopy (XPS) etc. The co-doping of S and N, as well as nanospherical morphology, have been confirmed by the characterization results. The average diameter of the nanospheres is around 200 nm, and the surface areas can be up to 653 m^2/g for the typical sample containing 9.5% of sulfur. The catalyst exhibited enhanced performance towards oxygen reduction reaction (ORR), long-term stability and excellent tolerance to the methanol in an alkaline medium. Especially, the addition of sulfur improved the performance of the catalyst significantly, and the optimal sulfur content for the catalyst is 9.5 wt%.

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References