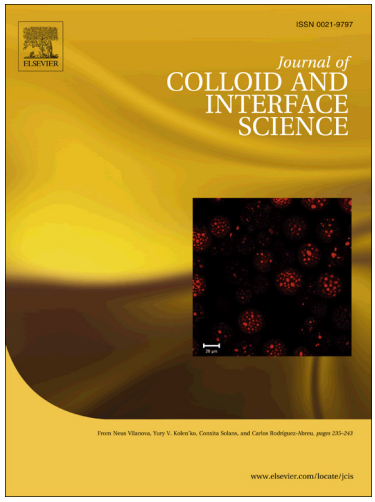

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Abstract

Fabrication of low-cost and efficient electrocatalyst for oxygen reduction reaction (ORR) is highly desirable. Herein, Zinc ferrite/reduced graphene oxide ($ZnFe_2O_4$/rGO) is prepared by a quite simple and environmentally benign approach and applied as a high performance ORR electrocatalyst for the first time. The surface morphology and chemical composition of $ZnFe_2O_4$/rGO are characterized by scanning electron microscopy, transmission electron microscopy, X-ray diffraction, X-ray photoelectron spectroscopy, thermogravimetric analysis and Fourier transform infrared spectroscopy. Cyclic voltammetry, linear sweep voltammetry and chronoamperometry are used to evaluate the electrochemical activities and stabilities of $ZnFe_2O_4$/rGO catalysts in alkaline media. Among $ZnFe_2O_4$/rGO with different mass ratios, the catalyst with 69.8 wt% $ZnFe_2O_4$ (called $ZnFe_2O_4$/rGO (3)) has the best catalytic activities and it shows much superior methanol tolerance and better durability than the commercial Pt/C catalyst. Due to the synergistic effect, the $ZnFe_2O_4$/rGO (3) nanohybrid exhibits high ORR catalytic performance and durability, which follows a desirable four electron transfer mechanism in alkaline media.