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Abstract

Microwave irradiation: In-situ conversion of nanoflakes to nanoflowers of ZnCo2O4 on Ni foam for enhanced electro-catalytic activity

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Abstract:

Spinel structure metal oxides provides the effective performance towards the electro-catalytic analysis. Among the spinel structure metal oxides, ZnCo2O4 has effective in the area of photocatalyst, gas sensor, li- ion batteries, supercapacitors and electro-oxidation. The performance of direct methanol fuel cells hinges on the activity of the catalyst. To enhance the electro-catalytic activity, a flower-like nanostructure of ZnCo0O4 assembled on nickel foam (NF) via microwave irradiation process, the whole process was finished within 15 min. The ZnCo2O4 nanoflower is successfully applied in the electro-catalytic oxidation of methanol and its electro-catalytic performance is investigated by cyclic voltammetry, chronoamperometry and electrochemical impedance spectroscopy, which exhibits excellent electro-catalytic activities towards methanol electro- oxidation in alkaline medium, including low onset potential (0.45 V), high current densities (222.3 mA cm-2) at 0.70 V (vs. SCE), and desirable electro-oxidation stability (91%) after 500 cycles in the presence of 1.0 M KOH mixed with 0.5 M methanol. The electrochemical oxidation of MeOH was also observed at higher concentration of MeOH up-to 4.0 M (0.5, 1.0, 2.0, 3.0 and 4.0 moles). The high electrochemical performance is mainly attributed to faster ion/electron transfer and an enhanced electrochemical kinetics. The present simple, and cost-effective synthesis approach can open new era for large-scale applications of the novel materials for different electrochemical applications.

Biography:

Sreekanth received his PhD in Chemistry from S.V. University, India, in 2009, under the supervision of Prof. K.S. Reddy. After that, he joined as an Assistant Professor in the Department of

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Publication of speakers:

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