Studies on bond relationship between energy of activation and catalytic activity of azomethine polymer framework enveloped over mesquite carbon hybrid composite electrodes for energy production applications

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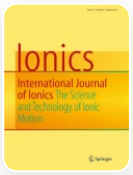

Ionics

Aims and scope

Submit manuscript

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Abstract

In the contemporary research work, an effort has been accomplished to correlate the catalytic activity bond relation with surface area and activation energy of the developed Ni-Co alloy–coated azomethine polymer framework enveloped over mesquite carbon hybrid electrodes for power device applications. For this perspective, a composite supporting material was developed using 3,3′-diaminobenzidine, terephthaldehyde and amine-functionalized mesquite carbon (AMC) via in situ aldimine condensation polymerization process. A series of Co–Ni alloy nanoparticle–coated azomethine polymer framework enveloped over mesquite carbon hybrid composite catalysts were developed, and their catalytic performance relations were determined using appropriate modern techniques. X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), scanning electron microscope (SEM), energy-dispersive X-ray spectroscopy (EDAX), highly resolution transmission electron microscopy (HRTEM), and cyclic voltammetry were utilized to distinguish and to find the nature of chemical bonds present, phase morphology, chemical composition, crystal structure, activation energy, surface area, and their relationship exist towards electrocatalytic activity of the prepared catalysts. In the data obtained from different modern analytical techniques, it