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Copper oxide on graphene oxide aerogel (CuO/rGO) nanocomposite as catalyst for hydrogen generation from hydrolysis of sodium borohydride

Faezeh Sabrioun, Hannaneh Heidari *

[a]*Department of Inorganic chemistry, Faculty of chemistry, Alzahra University, Tehran, Iran*

[*] *E-mail: h.heidari@alzahra.ac.ir*

In this study, copper oxide on graphene oxide aerogel (CuO/rGO) was synthesized by a facile method using sodium borohydride as a reducing agent [1, 2]. The structure of the as-synthesized composite was characterized by ultraviolet–visible spectroscopy (UV–vis), Fourier transform infrared spectroscopy (FT-IR), X-ray diffraction (XRD), X-ray Energy Dispersive Spectroscopy (EDS) and field emission scanning electron microscopy (FE-SEM). The catalytic activity of the nanocomposite was examined for sodium borohydride hydrolysis. The effects of different parameters such as catalyst amount, sodium borohydride concentration, temperature, and pH were investigated. The activation energy, enthalpy, and entropy for sodium borohydride hydrolysis were determined. The CuO/rGO catalyst performed best at neutral pH, room temperature, and the minimum amount of catalyst producing hydrogen at a rate of 61.11 L. min^{-1} .g^{-1}.

Keywords: Copper oxide, Graphene oxide, Aerogel, Sodium borohydride, Hydrolysis

References

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