



Novel Synthesis of rGO/CuO Nanocomposite and its Catalytic Application for the Oxidation of Styrene

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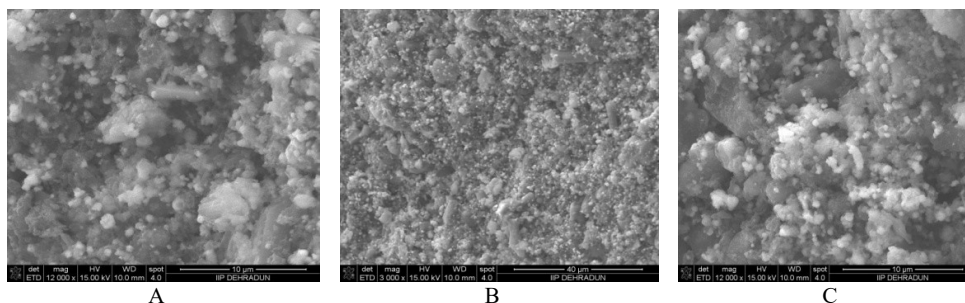
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Accepted on 4th March, 2025

ABSTRACT

It is providing a new hydrothermal technique for creating a heterogeneous composite catalyst called reduced graphene oxide/copper oxide (rGO/CuO) nanocomposite. In order to immobilise CuO nanoparticles on surface-functionalized reduced graphene oxide sheets, the synthesis entails reducing graphene oxide (GO) and CuCl₂ using sodium borohydride (NaBH₄) acting as a reducing agent. The resultant rGO/CuO nanocomposite is a great nano-catalyst for the oxidation of unsaturated hydrocarbons like styrene because of its high catalytic efficiency, affordability, reusability, and environmental friendliness. Several analytical methods, such as Field Emission Scanning Electron Microscopy (FESEM), Energy Dispersive X-ray Spectroscopy (EDX), Thermogravimetric Analysis (TGA), Fourier Transform Infrared Spectroscopy (FTIR), and X-ray Diffraction (XRD), are used to characterise the synthesized GO and rGO/CuO nanocomposites. The research shows that rGO/CuO has the potential to be a powerful catalyst in organic transformations, especially oxidation processes.

Graphical abstract:



SEM interpretation to show adsorption of CuO on the surface of reduced graphene oxide.

Keywords: rGO/CuO nanocomposite, heterogeneous catalyst, hydrothermal synthesis, oxidation, styrene.