

عنوان مقاله:

Green oxidation reactions by graphene oxide-based catalyst with aqueous hydrogen peroxide

محل انتشار:

نشریه آسیایی شیمی سبز, دوره 3, شماره 3 (سال: 1398)

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خلاصه مقاله:

This study reports the synthesis, characterization and catalytic properties of a novel supported catalyst on the basis of nickel acetate hydrate (NiOAC) immobilized on graphene oxide (GO) modified polyethylene glycol (PEG). The catalyst was characterized by scanning electron microscopy (FESEM), X-ray diffraction spectroscopy (XRD), furrier transforms infrared spectroscopy (FT-IR) and diffuse reluctance spectroscopy (DRS). It showed a high activity in the green oxidation of thioanisole as a model substrate to sulfoxide product at ambient temperature and presurre. To establish the general applicability of the process, various sulfides were subjected to the oxidation system using the synthesized catalyst. The reactivities of the sulfur compounds were influenced by two main factors, i.e., the electron density on the S atom and the steric hindrance of the sulfur compound. In addition, ethanol was selected as a green solvent for this procedure. The effects of the main process variables including H₂O₂ amount (mmol), reaction time (min) and catalyst amount (mg) were analyzed by response surface methodology (RSM) based on the central composite design (CCD). The optimal condition for conversion of thioanisole was found to be O/S ratio 3.4, reaction time 31 min for 21 mg of catalyst amount.

کلمات کلیدی:

Catalytic, graphene oxide, Green Oxidation, Nanocomposite polyethylene glycol

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