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Synthesis of modified sepiolite-g-polystyrene sulfonic acid nanohybrids by radiation induced graft polymerization

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ABSTRACT

In this study, polystyrene (PS) grafted sepiolite nanohybrid (MS-g-PS) was synthesized by using simultaneous radiation grafting technique in the presence of dichloromethane (DCM) as solvent. The radiation grafting process was carried out under inert atmosphere at room temperature using gamma rays from a Co-60 irradiator. The degree of grafting was affected by absorbed dose and monomer concentration in the mixture. Sulfonation of synthesized nanohybrid was carried out with sulfuric acid. Both the grafting of styrene and its sulfonate derivative were verified by Fourier transform infrared spectroscopy (FT-IR). The structural and morphological investigations of these nanohybrids have been investigated by X-ray diffraction (XRD) and field emission scanning electron microscopy (FESEM). The gravimetric investigations showed that grafting yield increases with the absorbed dose. Results showed that the system allows the controlled grafting of styrene onto sepiolite (Sep) in DCM.

Keywords: Radiation Grafting; Styrene; Nanohybrid; Ion exchange resins; Sepiolite

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