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Performance Evaluation of Synthesized Crosslinked Poly (Acrylic Acid /Acrylate) Loaded with Magnesium Nanoparticles as a Conductive hydrogel

Enas M. Ahmed[1]*; Ahmed T. El-Aref[2] and Ahmed M. Awad[1]

[1] Department of Chemical Engineering & Pilot Plant,
[2]Department of Pre-treatment and Finishing,
National Research Centre, Cairo, Egypt

Abstract : Poly(Acrylic Acid /Acrylate) superabsorbent hydrogel (SAH) loaded with magnesium nanoparticles (Mg NPs) was synthesized via a free radical reaction using potassium persulphate (KPS) initiating system in presence of N,N`-methylenebisacrylamide (MBA) as a crosslinking agent and different concentrations of magnesium oxide. Swelling capacity of the prepared SAH was thoroughly investigated. Size and distribution of the nanoparticles and their dependence on the amount of magnesium oxide employed were also studied using Transmission Electron Microscopy (TEM). The morphology of the prepared dry SAH products was characterized by Scanning Electronic Microscopy (SEM) whereas the chemical components of SAH products were investigated using EDAX under SEM microscopy. The results revealed that size distribution of magnesium oxide nanoparticles depends on magnesium oxide concentration in the reaction medium. On the other hand the conductivity of the prepared SAH was found to be in relation to the initial concentration of magnesium oxide.
Keywords: superabsorbent hydrogel; magnesium oxide; nanoparticles; conductivity.

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