

Synergistic Effect of Aluminium Oxide / Poly (acrylamide-co-acrylic acid) Hybrid Composite

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ABSTRACT

The progress in the synthesis and technology of hydrogels makes these materials attractive structures with possible applications. In the present work, In-situ polymerization technique synthesized alumina hydrogel composite with water as a green solvent. The inclusion/incorporation of metal oxide particles in three-dimensional polymeric structures is an innovative means for obtaining multicomponent systems with diverse functionality within a hybrid hydrogel network. Polymer compositions with aluminium oxide, can improve their thermal properties and self-sustaining ability under working environmental conditions. The composite of poly(acrylamide-co-acrylic acid) [P(AM-co-AA)] with aluminium oxide as a composite was created as a result of their intermolecular interactions. The creation of a composite was confirmed by FT-IR spectroscopy, DSC, TGA, and FE-SEM analysis. The aluminium oxide particles were homogeneously distributed in the P(AM-co-AA). The incorporation of aluminium oxide particles gives rise to the enhancement of thermal stability due to the strong interactions between aluminium oxide and poly(acrylamide-co-acrylic acid) polymer. Hence, the synthesized materials were biodegradable, environment friendly and biocompatible which touches the green chemistry route.

Keywords :- Aluminium oxide, Hydrogel, Composite, Interactions, Green Chemistry