



Ceric ion-induced synthesis of polymethyl methacrylate-grafted oatmeal: its characterizations and applications

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ABSTRACT

The present studies report the synthesis of a novel graft copolymer “polymethyl methacrylate-grafted oatmeal” (OAT-g-PMMA) using “conventional” technique. Grafting of PMMA chains on the backbone of parent biopolymer (oatmeal) was confirmed through various physicochemical techniques like intrinsic viscosity, FTIR, elemental analysis (C, H, N, S and O), scanning electron microscopy, thermal gravimetric analysis, number-average molecular weight, solubility, ¹³C-CP/MAS solid-state NMR spectroscopy and P-XRD. The intrinsic viscosity of oatmeal substantially improved after grafting of PMMA chains. The grafted biopolymers were assessed for its implication as a potential flocculant by standard “jar test” and “settling test” protocol. Flocculation characteristics of the synthesized OAT-g-PMMA were compared with parent biopolymer (oatmeal) and alum in 0.25 wt.% kaolin suspension and then in municipal wastewater through standard “jar test” protocol which showed encouraging results.

Keywords: Biopolymers; “Conventional” synthesis; Graft copolymers; ¹³C-CP/MAS solid-state NMR spectroscopy; Flocculant; “Jar test” protocol; Municipal wastewater treatment

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