

Synthesis and Characterization of Microcrystalline Cellulose-g Poly (Acrylamide) Superporous Absorbent Composite using Graft Copolymerization Methods

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Abstract

Superabsorbent polymer was synthesized using graft copolymerization method incorporated with micro crystalline cellulose (MCC) as filler and sodium bicarbonate (NaHCO₃) as foaming agent. The addition of organic filler and porosity generator produced a highly porous biodegradable superabsorbent polymer composite (HP-PAM-g-MCC), which improves the characteristics of the acquired products, in comparison with the conventional SAP. Determination of water absorbency was tested using tea bag method after immersed in distilled water. The effects on amount of MCC and sodium bicarbonate addition towards water absorbency were studied to determine the optimum condition of PAM-g-MCC SAPs. The maximum water absorbency of PAM-g-MCC-SAPs was achieved at 1.0wt% of MCC and 1 wt% NaHCO₃ which resulting 74.01 g/g and 93.96 g/g of water absorbency. The FTIR and SEM analyses data reveal the presence of chemical bonding and morphological characteristics correspond to the water absorption capacity of the HP-PAM-g-MCC.

Keywords: Cellulose; Biodegradable; Highly porous; Superabsorbent polymer.