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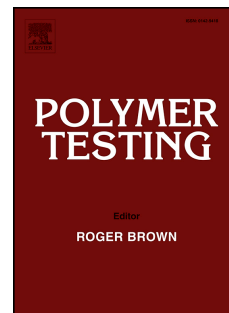
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## Superabsorbent materials derived from hydroxyethyl cellulose and bentonite: preparation, characterization and swelling capacities

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### Abstract

Superabsorbent polymers (SAPs) and composites (SAPCs) were prepared entirely by graft copolymerization of polyacrylamide (PAM) onto hydroxyethyl cellulose (HEC), using potassium persulfate (KPS) as an initiator, and *N,N'*-methylenebisacrylamide (MBA) as a crosslinker, in an aqueous solution. The extent of grafting was evaluated from % grafting efficiency (%GE) for various of HEC/AM ratios, and a near optimal ratio was determined. Influences of various preparation parameters, *i.e.*, the ratio of HEC/AM, amount of initiator and crosslinker, reaction temperature and time, and amount of filler on water swelling capacity of SAPs and SAPCs were studied. An FT-IR determination confirmed that the PAM was successfully grafted onto the HEC backbone, by showing absorption bands of the HEC backbone and new absorption bands from the grafted copolymer. The swelling capacity of SAPs and SAPCs depended strongly on different parameters, and the maximum swelling capacity was over 426 g/g and 538 g/g for the SAPs and SAPCs, respectively.

**Keywords:** hydrogel; superabsorbent polymer; hydroxyethyl cellulose; acrylamide; graft copolymerization

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