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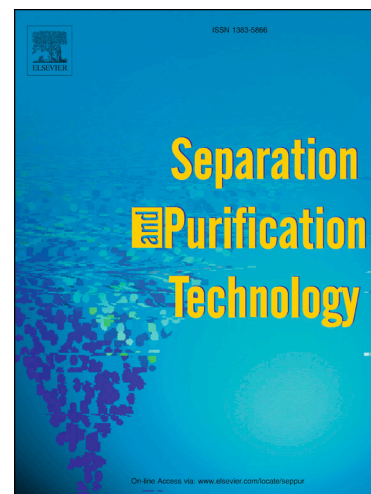
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## Metal ions and organic dyes sorption applications of cellulose grafted with binary vinyl monomers

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### Abstract

Metal ions and dyes sorption applications of Cell-g-AASO<sub>3</sub>H-co-GMA were studied, herein. The adsorbent Cell-g-AASO<sub>3</sub>H-co-GMA was synthesized through grafting of 2-acrylamido-2-methylpropane sulfonic acid (AASO<sub>3</sub>H) and binary comonomer glycidyl methacrylate (GMA) using potassium persulfate (KPS) as free radical chemical initiator and *N,N'*-methylene bisacrylamide (NMBA) as cross-linker onto the cellulose extracted from agricultural waste rice husk. The graft copolymer was characterized for morphological, structural, compositional, crystalline and thermal properties through different characterization techniques like FTIR, FESEM, XRD, and TGA/DTA. The swelling behavior of the graft copolymer was evaluated at 2.2, 7.0 and 9.4 pH and compared with the pristine cellulose to explore their applications for the sorption of metal ions and dyes from their aqueous solutions. The adsorption parameters were elaborated for model cationic malachite green (MG) and crystal violet (CV) dyes, anionic congo red (CR) dye and Ni<sup>2+</sup> and Cu<sup>2+</sup> ions. The adsorption of dyes and metal ions was investigated as a function of contact time, temperature, pH and concentration. The mechanism of the adsorption and the interactions between adsorbent Cell-g-AASO<sub>3</sub>H-co-GMA and different adsorbates were studied using different kinetics and adsorption isotherms models. The adsorption data for dyes and metal ions fitted well with the pseudo-second-order

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