

Abstract:

The deinking ability of chitosan-based particles in the pretreatment of recycling paper was studied. All these polymers were able to adsorb carbon black as ink pigment. Amount of adsorbents, contact time, solution pH and temperature were optimized to estimate maximum sorption capacity of polymers. The optimum condition of carbon black adsorption was achieved using chitosan-coated Ca-alginate beads at 30 min, 35 °C, pH 6.5 and 220 rpm of agitation speed. The adsorption capacity was more than 80%. Packed-bed reactor filled with chitosan-coated alginate beads was conducted and operated under the optimal conditions. More than 95% of ink was adsorbed onto carriers after 20 h. Saccharification with industrial enzyme preparation of deinked paper pulp was carried out and sugars released were converted into ethanol. The results of alcoholic fermentation confirmed the success of the deinking process. Our results are very promising in the development of pretreatment technology to enhance the efficiency of the utilization of recycling paper.