

Sorption Kinetic Studies of Medical Grade Activated Carbon Prepared from Papaya Seeds

Abstract

The aim of this investigation was to determine the adsorption behavior and kinetics of methylene blue in aqueous solution on activated carbons prepared from guava seeds by way of the two stage activation method in self-generated atmosphere using a muffle furnace. The yield and ash contents of the activated carbons obtained decreased with the increase of activation temperature and time. FT-IR spectra indicated high surface functional groups present in the carbons. The optimised activated carbon, AK6, had a sorption kinetics that complied with the pseudo-second order kinetics and was fitted well to Langmuir isotherm model. The highest adsorption capacity was obtained when the samples (AK6) were subjected to activation temperature of 500 °C for 45 minutes giving iodine number of 198.12 mg g⁻¹ and the percentage of methylene blue removal efficiency of 84.75 %.