

Influence of Water Hardness on Column Adsorption of Paracetamol by Biomass of Babassu Coconut Shell

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Abstract : This study was the adsorption of paracetamol from aqueous solutions on fixed beds of activated carbon from babassy coconut shell. Several operation conditions on the shape of breakthrough curves were investigated and proposed model is successfully validated with the literature data and obtained experimental data. The initial paracetamol concentration increases from 20 to 50 mg.L-1, and the break point time decreases, t_b , from 18.00 to 10.50 hours. The fraction of unused bed length, HUNB, at break-through point is obtained in the range of 1.62 to 2.81 for 20 to 50 mg.L-1 of initial paracetamol concentration. The presence of Ca+2 and Mg+2 are responsible for increasing the hardness of the water, affects significantly the adsorption kinetics, and lower removal efficiency by adsorption of paracetamol on activated carbons. The axial dispersion coefficients, DL, was constants for concentrated feed solution, but this parameter has different values for deionized and hardness water. The mass transfer coefficient, Ks, was increasing with concentrated feed solution.

Keywords : paracetamol, adsorption, water hardness, activated carbon.

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