Separation of lactic acid by multiwall carbon nanotube adsorption from water

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A B S T R A C T

This study aims to present adsorption data for the separation of lactic acid from water by multiwall carbon nanotube (MWCNT). The effects of the equilibrium time, the initial lactic acid concentration and the amount of MWCNT on lactic acid adsorption have investigated experimentally. The adsorption capacity of MWCNT at different conditions were determined and compared. It has been found that the considerable amount of lactic acid has removed by MWCNT. Langmuir, Freundlich and Temkin isotherms have been used to define the mechanism of adsorption. To describe adsorption kinetic of lactic acid on MWCNT, Pseudo-first order, Pseudo-second order, Elovich kinetic models and Weber–Morris intra-particle diffusion model have been applied. Langmuir isotherm has been found as the best fit the equilibrium data for lactic acid adsorption with value of R square 0.99. Also as the most suitable models, Elovich kinetic model and Weber–Morris intra-particle diffusion model have been determined with values of R square 0.95.

Keywords: Lactic acid; Adsorption; Carbon nanotube

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