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GAC Adsorption Modelling of Metsulfuron Methyl from Water

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Abstract : In this study, the adsorption capacity of GAC with metsulfuron methyl was evaluated by using adsorption equilibrium and a fixed bed. Mathematical modelling was also used to simulate the GAC adsorption behavior. Adsorption equilibrium experiment of GAC was conducted using a constant concentration of metsulfuron methyl of 10 mg/L. The purpose of this study was to find the single component equilibrium concentration of herbicide. The adsorption behavior was simulated using the Langmuir, Freundlich, and Sips isotherm. The Sips isotherm fitted the experimental data reasonably well with an error of 6.6 % compared with 15.72 % and 7.07% for the Langmuir isotherm and Freudrich isotherm. Modelling using GAC adsorption theory could not replicate the experimental results in fixed bed column of 10 and 15 cm bed depths after a period more than 10 days of operation. This phenomenon is attributed to the formation of micro-organism (BAC) on the surface of GAC in addition to GAC alone.

Keywords : isotherm, adsorption equilibrium, GAC, metsulfuron methyl
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