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Sorption of Cu (II) ion from aqueous solution by scrap tyre

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ABSTRACT

The use of scrap tyre (ST) for the sorption of Cu (II) ion from aqueous solution has been studied in a batch experiment. Investigation includes the effect of initial Cu (II) ion concentration and agitation speed. Three kinetic models (pseudo first order, pseudo second order and Elovich kinetic models), were employed to predict the overall rate constant of sorption, the equilibrium sorption capacity and the initial sorption rate. The equilibrium sorption of Cu (II) ion by ST was analysed using Langmuir, Freundlich and Temkin isotherm models. The monolayer sorption capacity (mg/g) of ST for Cu (II) ion was 34.84. Thermodynamic parameters were calculated and the sorption process was found to be spontaneous and exothermic. The use of ST as a sorbent in Cu (II) ion attenuation in wastewater shall help to reduce the cost of treating Cu (II) ion bearing wastewater and to curtail the negative environmental impact of ST as a solid waste.

Keywords: Adsorptions; Copper ion; Scrap tyre; Mass transfer; Intraparticle; Liquid film

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