Adsorption of lead and Zinc ions onto the surface of coffee residues / 管書賢 撰 .- 彰化縣大村鄉

管書賢、葉啟輝, 吳忠信

E-mail: 354751@mail.dyu.edu.tw

ABSTRACT

This study employed coffee residues to remove lead ions and zinc ions from wastewater. The effects of lead and zinc concentration, coffee residues dosage, pH and temperature on adsorption of lead ions and zinc ions by coffee residues were evaluated. Bangham, pseudo first-order, pseudo second-order and intraparticle diffusion models were adopted to evaluate experimental data and thereby elucidate the kinetic adsorption process. Additionally, this study used the Freundlich, Langmuir, Redlich-Peterson, Dubinin-Radushkevich and Tempkin isotherms to describe equilibrium adsorption. The adsorption percentage of lead ions and zinc ions increased as coffee residues dosage and temperature increased. The pseudo second-order model best represented adsorption kinetics. The equilibrium adsorption of lead ions and zinc ions are best fitted in the Langmuir isotherm. The capacity of coffee residues to adsorb lead ions and zinc ions were 29.2 mg/g and 12.8 mg/g (55°C). The values of enthalpy (13.8 and 10.6 kJ/mol) and entropy (0.07 and 0.04 kJ/mol．K) both indicate that the adsorption of lead ions and zinc ions onto coffee residues were a physisorption process.

Keywords : Adsorption、Coffee residues、Lead、Zinc

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