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Adsorption of Lead Ions onto Cattle Bone

C. I. Egwuatu*, O. F. Obumselu, C. J. O.Anarado, N. L. Umedum,

Department of Pure and Industrial Chemistry, Nnamdi Azikiwe University, P. M. B. 5025 Awka, Anambra State, South Eastern Nigeria

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Abstract: The sorption kinetics, thermodynamics and isotherms of lead adsorption on cattle bone were investigated. FTIR analysis revealed the presence of functional groups like OH^-, CONH, PO_4^{3-}, CO_3^{2-} that were capable of adsorbing Pb^{2+}. Results showed that the pseudo-second order kinetic model with R2 best described the kinetics, and $q_{theoritical}$ values of 0.9999 and 0.96955 mg/g. Equilibrium data were well described by both Freundlich and Langmuir isotherms with R^2 values of 0.9975 and 0.9967. Maximum sorption capacity q_{max} obtained was 1.9573mg/g. Optimum sorption was observed at pH 4. Thermodynamics parameters obtained were ΔH (91.237kJ/mol), ΔS (-0.293kJ/mol/K). ΔG values were positive, increasing with increase in temperature.

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* *Corresponding: E-Mail: chy4jesusalwayz@yahoo.com, Tel: +2348063620152;*