EQUILIBRIUM, KINETIC AND THERMODYNAMIC STUDIES OF ZN (II) FROM WASTEWATER BY USING ACTIVATED SEWAGE SLUDGE AS AN ADSORBENT.

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Abstract: Removal of heavy metal ions from wastewater effluents cause a potential hazard to the environment hence these metals need to be removed from the water bodies. In this study, activated sewage sludge was used as an adsorbent for the removal of Zn (II) from wastewater. The sewage sludge was characterized using various techniques such as FTIR, SEM, and XRD analysis. The adsorption experiments were performed using the batch process. The equilibrium data were studied using the Langmuir, Freundlich, Temkin and Redlich-Peterson isotherm models. The results of batch studies showed that the removal efficiency was found to be 99% at equilibrium pH (5.74), adsorbent dose (15 g/L), contact time (180 minutes) at 30^{o} C. Kinetic studies investigated by various models like pseudo first order, pseudo second order, intra-particle diffusion and Pseudo second order model was found to be most suitable. Thermodynamic parameters were evaluated for the metal adsorbent systems which revealed that the adsorption process was spontaneous and endothermic in nature. The results indicated that the Activated sewage sludge could be used as a cost-efficient adsorbent for the removal of Zinc (II) from wastewater.

References:

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