

## **A Study on Retention and Release of Zn (II) by Mineral and Carbonaceous Solid Phases Alone and in a Blend**

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The study was carried out to understand the interaction of Zinc (II), which happens to be an essential micronutrient and essential element for all life, with a mineral surface, Montmorillonite Clay which happens to be an important soil constituent and is compared with carbonaceous solid phase such as Activated Carbon. It was found that retention takes place through chemisorptions, ion exchange and probably precipitation also involved at higher pH.

The effect of various parameters such as pH, contact time, adsorbent dosage and initial concentration of the metal ion on the kinetics of adsorption was studied. At higher pH of the clay system, zinc becomes less soluble. The adsorption behaviour of zinc using a blend of Montmorillonite Clay, Activated Carbon was also studied. It was found that when the percentage of Activated Carbon in the blend increases, the percentage retention decreases. The release of Zn (II) was studied using different extracting solutions. The desorption was insignificant indicating the possibility of formation of inner sphere complexes. The adsorption data was also applied to the effluent from Zinc Smelting Industry.

**Key words :** *Adsorption kinetics, Zn (II), Montmorillonite Clay, activated carbon, batch study, comparison, Langmuir isotherm, Freundlich Isotherm, desorption studies, effluents.*