

Adsorption of Lead and Zinc Ions on Sediments

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ABSTRACT

Adsorption is one of the most important processes in water quality control. It may determine the fate and transport of pollutants in the aquatic environment. The adsorption of lead and zinc ions on the bed sediments of river Kali in western Uttar Pradesh, India has been studied. The role of the coarser sediment fraction (210-250 gm) has been elucidated and compared to those of the clay and silt fractions. The parameters controlling the uptake, viz., initial metal ion concentration, solution pH, sediment dose, contact time, and particle size have been evaluated. The adsorption of metal ions increases with increasing initial metal ion concentration. The optimum contact time in which equilibrium is attained was found to be 45 min for both the metal ions. The extent of adsorption increases with an increase of pH. The adsorption of metal ions on the sediments follows two phases, a linear phase of adsorption followed by a flat plateau section. Further, the adsorption of metal ions increases with increasing adsorbent doses and decreases with adsorbent particle size. The two geochemical phases, namely iron and manganese oxide, act as the active support material for the adsorption of two metal ions.