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ADSORPTION BEHAVIOR OF SOME HEAVY METALS ON SOILS TOSHKHA AREA, ASWAN, EGYPT

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ABSTRACT

Soil contamination with heavy metal is one of the most important environmental problems throughout the world. A study was conducted to investigate the adsorption of cobalt and copper in thirty soil samples originating from Toshka district, Aswan, Egypt. These soils are characterized by its high pH, high carbonates and low organic matter contents which made the heavy metals adsorbed on it. The effect of various parameters (pH, ionic strength, initial cation concentration) were investigated. The data of adsorption study revealed that the adsorption increased with the elevation of the pH values. The optimum adsorption were achieved at pH 5 for Co and 7 for Cu for sandy soils, 7 for Co and 5 for Cu for sandy loam soils and in case of loamy sand soils, the optimum pH values were 7 for Co and 5 for Cu. The cation adsorption capacity increased as the ionic strength decreased and with increasing the initial in concentration for each of the investigated soils. Freundlich and Langmuir cation equation isotherms were used to describe the adsorption processes. Correlations of metal adsorption with soil parameters were observed together with varying adsorption behavior of cations to different soil types. The adsorption method was applied successfully for determined the capacity of soils to retain metals and from this find that the environmental impact of metal additions to soil depends on its adsorption ability.

Key word: Adsorption, Cobalt, Concentration, Copper, Ionic strength, pH, Soil.