
An Experimental Study of Cadmium Ion Exchangeability*

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Abstract: A laboratory study of cadmium exchangeability revealed large differences in extractable cadmium which are dependent on the exchange solution being utilized. The standard exchange solutions employed in this study were: N NaNO₃, N NaOAc, N NH₄OAc, N CaCl₂, and 2N CaCl₂, in order of increasing Cd removal. An interpretation of the chemical behavior of Cd and an experiment with mixed sodium nitrate and acetate solutions suggest that cadmium carbonate, octavite, was precipitated when the sediments were saturated with Cd prior to the exchange experiments and that the quantities of Cd recovered in the acetate solutions were erroneously high because of the dissolution of the carbonate material. Dissolution of solid phases, the lack of pH buffering, and the possible formation of a complex hydroxyl chloride salt also made the Cd values obtained with the chloride solutions too high. Sodium nitrate exchange solutions minimize these problems and are thought to best represent the exchangeable cadmium in the sediment.

Key Words: Adsorption • Cadmium • Exchange • Ion • Sedimentary

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