The Effect of Cation Exchange of Tris(Ethylenediamine)Cobalt(III) for Sodium on Nitrogen Sorption by Montmorillonite

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Abstract: The cation exchange process between tris(ethylenediamine)cobalt(III) and Na^+ on montmorillonite was studied by atomic absorption spectrophotometry, X-ray diffraction, differential thermal analysis, and nitrogen sorption at 78 ° K The exchange of $Co(en)_3^{3+}$ for Na^+ was found to be extremely favorable, with a tendency toward segregation of the two kinds of cations in the mixed clays studied. Small amounts of $Co(en)_3^{+3}$ were found to lower the nitrogen sorption capacity of Na^+ montmorillonite while clays with high $Co(en)_3^{+3}$ content had greatly enhanced sorption. An explanation is offered in terms of a dual role of the $Co(en)_3^{+3}$ in determining the kind and amount of nitrogen sorption in the exchanged montmorillonite.

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