

## **Environmental Protection and treatment of Radio Active waste solutions in the Caspian sea using local clay minerals .**

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### **Abstract**

The aim of this work is to establish the optimum conditions for the removal of some radioactive elements from their waste solutions in the south west of the Caspian sea. In this respect an exploratory investigation is carried out using the clay minerals (kaolinite and vermiculite) to test the feasibility of its using for decontamination purposes and volume reduction. The different parameters affecting the sorption capacity of the radioactive elements of Cs-<sup>137</sup>, Co-<sup>60</sup> and Eu-(<sup>152</sup>+<sup>154</sup>) by the investigated clay minerals have been studied. The uptake of the metal ion was determined for clay mineral-cation solution system as a function of contact time, pH, metal ion concentration and presence of some competing cations. Sorption data have been interpreted in terms of Freundlich equation. The presence of some organic complexing agents also affect the sorption process. The desorption of the investigated metal ions was also studied using different desorption solutions. The obtained data show that the clay mineral vermiculite can be considered as an efficient sorbent for metal cations from their aqueous solutions since the uptake efficiency is more than 90% for the three elements studied.

### **1. Introduction**

In view of the nuclear waste management , the sorption studies of radionuclides on various materials is of great importance and significance in evaluating the feasibility of a particular natural material for its using for the decontamination purposes and volume reduction. Many naturally occurring materials exhibit one or more of the useful sorption or chemical reactions with radioactive or stable trace elements . These natural materials are seldom \_ pure chemical species and thus a number of different reactions may occur . sorption of various radionuclides on soils and clay minerals has been studied by several authors[1,2]. The effect of synthetic organic complexing

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