

## **IODINE SORPTION ON BENTONITE - RADIOMETRIC AND ELECTROCHEMICAL STUDY**

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Ability of bentonite to sorb inorganic iodine compounds was investigated to predict transport of radioactive iodine through the backfill material of nuclear waste repository to the biosphere. Bentonite R, selected for this study, is a montmorillonitic clay from locality Rokle (situated in north - western Bohemia) which is supposed to be used as a constituent of engineering barrier system in the deep repository of radioactive waste in Czech Republic.

The experiments focused on kinetics of iodine retardation on bentonite, influence of aqueous phase pH, buffering properties of bentonite, etc. were carried out by batch method. Distribution coefficient  $K_D$  was the criterion applied for evaluation of iodine interaction with solid phase.

High sorption potential of bentonite to cationic forms of various radionuclides, resulting from relatively high cation exchange capacity, is generally known. On the other hand the inorganic anions are not adsorbed strongly to mineral surface of clays thus uptake of iodine (occurring mainly at iodide ( $I^-$ ) or iodate ( $IO_3^-$ ) form under oxic conditions) is limited. The distribution coefficients of iodine anions' sorption on bentonite R reach order of magnitude  $10^{-1}$  mL/g. In order to increase the sorption capacity of the solid phase, several additives were added to bentonite. Most of them didn't provide satisfactory results except of the addition of activated carbon, which has high surface area.

Electromigration and polarographic methods were used for investigation of the redox state of iodine in aqueous phase and determination of  $K_D$  values as well. Acquired results were compared with data obtained by radiometric measurements.

*This research was supported by the Ministry of Education, Youth and Sports of the Czech Republic under the project MSM 223400008.*