

## **Sorption on selected samples of chlorite – bearing rocks of South – Western Poland**

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Europium (Eu) is a chemical homolog to many actinide ions, which are a serious problem in nuclear waste management, due to their high radioactivity and toxicity. In this study the sorption properties of Eu(III) onto chlorite bearing rocks (phyllites) from Jarnołtówek (Opawskie Mountains) and Pomocne (Kaczawskie Mountains) were analyzed. All rock samples are primarily composed of quartz, muscovite, biotite and chlorite. XRD analysis indicates, that the amount of chlorites varies in the range from 10 to 25 wt%.

Tests of Eu sorption were carried out under batch conditions, taking into account the influence of the initial metal ion concentration (206 mg / L), solution pH (4.5 and 8.0), ionic strength of the solution (100 mg/L ion content) and sorbent doses (1, 5 and 10g/L). These experiments allowed to determine the sorption capacity (q) of phyllite samples by determination of isotherms and sorption parameters in Freundlich, Langmuir and Dubinin & Raduszkiewicz equations. The sorption of Eu ions has a high pH-dependence, with clear tendency to increase in alkaline conditions. The calculated parameter  $q_{max}$  (Langmuir isotherms), indicates the maximum sorption capacity of the sorbent varies depending on sorbent doses, from 2.35 (10g/L and pH=4) to 36.0 (1g/L, pH=8). SEM samples study after sorption has shown an important role of iron oxides/hydroxides associates with mica/chlorite intergrowths.

The project has been financed from the funds of the National Science Centre, Poland, NCN UMO-2014/15/B/ST10/0228