



Contribution ID: 1050

Type: Poster

Interaction of ^{137}Cs with synthetic geopolymer and cementitious materials

Monday, May 16, 2022 6:06 PM (3 minutes)

When nuclear facilities, all types of radioactive waste are generated, including intermediate and highly active radioactive waste, which cannot be disposed of in current radioactive waste repositories in the Czech Republic. Therefore, it is necessary to find filling materials used in deep repositories that are environmentally safe for a long time. The aim of the ALMARA project is to study and test these materials.

The subject of this work is the sorption of cesium in cementitious materials and synthetic geopolymers, the determination of the equilibrium time required for the sorption of ^{137}Cs . The batch experiment was carried out with a solution of $^{137}\text{CsCl}$ in synthetic granite water on a synthetic geopolymer, hardened cement paste, cement mixed with iron nanoparticles (1% by weight) or bentonite (20% by weight). These materials were used in two different particle sizes (mesh fractions less than 0.5 mm and mesh fractions between 1 and 2 mm) and two different liquid-solid ratios (5 and 10 ml/g). Partition coefficients were calculated to compare these materials.

Acknowledgment

The work described herein was funded by the ALMARA project –Technology Agency of the Czech Republic –FW01010115.

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Session Classification: Nuclear Fuel Cycle

Track Classification: Chemistry of Nuclear Fuel Cycle, Radiochemical Problems in Nuclear Waste Management