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14C labelled organic molecules migration and interaction in/with the cement based materials

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Introduction
Cements and concretes have been widely used in intermediate/low level waste (I/LLW) management in Czech Republic, being used namely as solidification material. Moreover, cement materials are con-sidered also for disposal of high level waste (HLW) in deep geology repository (DGR), hereby being considered both for solidification and construction materials. 14C was chosen as a relevant contami-nant and also organic compounds are present in concrete as an additives and plasticizers and their degradation products which may influence the migration and interaction of other contaminants.
Sorption and diffusion experiments
14C acetate and 14C formate were applied as tracers in the sorption and diffusion experiments on different cement based materials (cement pastes, mortars and concretes). The acetate and formate were also identified as the representatives of organics degradation product of plasticizers.
Sorption experiments with were arranged in the form of batch reactors, where the crushed material is mixed with the liquid phase, pure portlandite water or synthetic granitic water (SGW). Diffusion exper-iments were applying through diffusion method. The tested solid phase materials are disc shape samples (50 mm in diameter, approx. 10 mm thick) which are placed into own designed and made diffusion cells using the portlandite water or synthetic granitic water (SGW) as the liquid phase.
Migration and interaction of 14C labelled acetate and formate are also performed to describe the behaviour of organics degradation products in cement environment.
Structural, mechanical, chemical and mineralogical characterisation of cementitious materials is also provided to describe the properties of solid phase and their influence in migration properties.

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