

IDENTIFICATION OF PATHWAYS FOR RADIONUCLIDE MIGRATION IN METAVOLCANITES OF THE SOUTHERN URALS REGION, RUSSIA

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An attempt was undertaken to use the data on the redistribution of Cs and Sr stable isotopes in metavolcanic rocks for the assessment of the possible pathways for migration of their radioactive analogues from the underground repository for solidified intermediate-lived high-level wastes (HLW), which construction is planned at the PA Mayak site. It was found that: 1. The metavolcanites S2-D1 age belong to various facies including lava facies, welded tuffs, pyroclastites and paratuffites which have undergone regional greenschist facies metamorphism as well as low-temperature alterations. 2. The main role in redistribution of Cs and Sr belongs to the mineral-chemical composition of linear zones of schistosity, mylonitization, cataclasis and brecciation associated with variations of density, P and S-wave rates, Young's and shear moduli and Poisson's ratio, porosity and permeability. 3. Higher Sr concentrations are confined in zones of cataclasis and brecciation with predominant carbonate-epidote mineralization while higher Cs contents occur within zones of mylonitization, cataclasis and brecciation with mineral concentrators such as albite, chlorite, sericite, Fe-Ti oxides and hydroxides. 4. Occurrence of linear zones of dislocation cannot be considered a negative factor for the safety assessment of the repository, since mineral-concentrators of radionuclides are manifested there rather intensively. Whereas the presence of non-mineralized transverse fissures can become one of the crucial factors in migration of radionuclides and greatly contributing to the degradation of retentivity characteristics of the strata.