

Nuclide Release Rates from the Near-field of a HLW Repository

Youn-Myoung Lee, Yong-Soo Hwang, Chul-Hyung Kang, Pil-Soo Hahn

Korea Atomic Energy Research Institute, 150 Deokjin, Yuseong, Daejeon 305-600, Korea

ymlee@kaeri.re.kr

To quantify the nuclide release from the canisters damaged initially or due to whatever the reason after disposal, an in depth modeling for the nuclide transport through the near-field has been carried out by ACGEO2, which is developed based on the compartment modeling method utilizing AMBER. After leakage from the canister, nuclides will spread out through buffer material surrounding canister before migrating farther into flowing groundwater in the fractures possibly embedded at various locations of the host rock medium, through which preferential nuclide transfer into the far-field seems to take place. The objective of this paper is to illustrate the calculation results, with newly introduced compartments such as the tunnel crown and the excavation disturbed zone (EDZ) as well as nuclide pathways, for the nuclide release from the near-field of the HLW repository. Calculation of nuclide release from the near-field is very important not only to show final safety of the repository, but also to investigate the functionality of the repository system as well as in view of its design feedback.

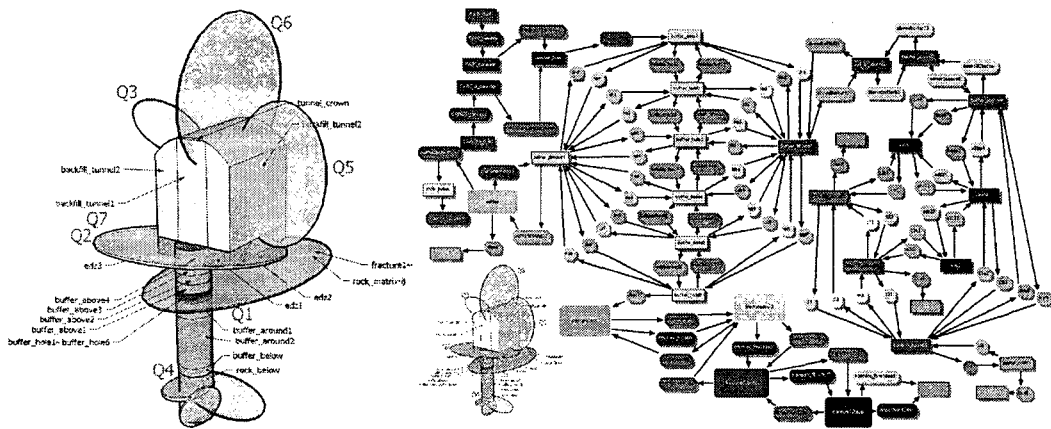


Fig. 1. Near-field of the repository embedded by fractures and implemented compartment scheme for nuclide flux calculation.

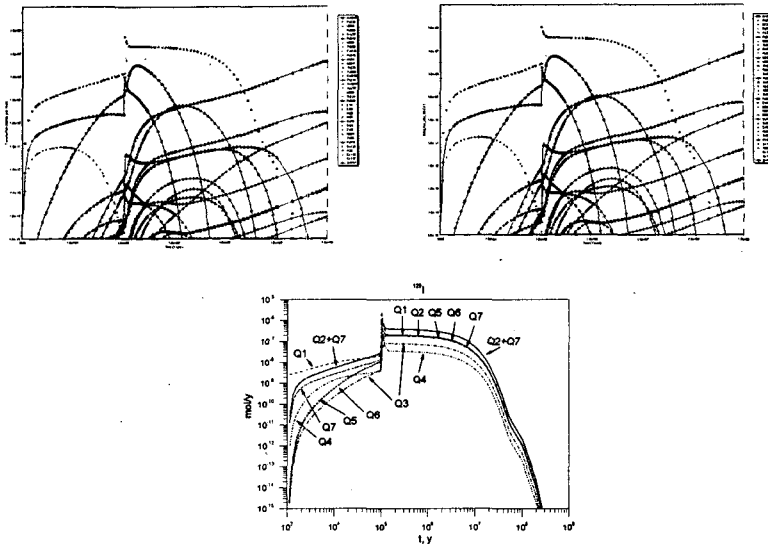


Fig. 2. (from left) Nuclide release rates from point 2, from point 2 and 7, and release rate of ¹²⁹I from each release point to the single fractures or fracture zones in the near-field of the repository.