
Developement of numerical model to predict effect of rock grouting

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For the geological disposal of radioactive waste, it is extremely important to reduce the permeability of rock masses around disposal tunnels using grouting from the viewpoint of reducing the influence of water inflow on the clay barrier to ensure the natural barrier performance expected of rock masses.

In this study, a numerical analysis method was developed in order to predict and evaluate the grouting effect based on the fracture information of the bedrock, in order to obtain the maximum reduction of permeability by means of grouting. Laboratory tests were also conducted simulating the grouting of a fracture, examining the validity of the developed method. Permeability was improved with the fracture aperture reduction due to sedimentation and adsorption of grout. The developed model can reproduce the experimental results, considering sedimentation from grout liquid to solid phase depending on the velocity change along the flow path and grout concentration. On the other hand, the parameters used in the model vary considerably depending on the experimental conditions, therefore systematic determination of the model parameters as well as model improvement should be addressed as future issues.
