ANALYSIS OF PERMEATION PROCESS IN ROCK BY MEANS OF X-RAY CT

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ABSTRACT
The applicability of X-ray CT method to the visualization and the analysis of water permeation process was discussed. Here the one-dimensional water permeation tests by using Kimachi sandstone were conducted. The effect of the confining pressure together with the effect of suction was analyzed, and the procedure to evaluate coefficient of permeability was discussed under the assumption that the samples have macroscopically homogeneous structure as for water permeation. It was found from the results of visualization that permeation process is almost uniform and confirmed that the assumption of one-dimensional permeation can be applicable. By applying the introduced technique, the coefficient of permeability was correctly evaluated. The pressure dependency of coefficient of permeability was emerged and the good applicability of X-ray CT to the analysis of permeation phenomena was shown. The heterogeneity of water permeation was also discussed and it was found that the effect of the heterogeneity is negligible in the case of Kimachi sandstone.