

The Effect of Acrylic Gel Grouting on Groundwater in Porous Media

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Abstract : When digging excavations, groundwater bearing layers are often encountered. In order to allow anhydrous excavation, soil groutings are carried out, which form a water-impermeable layer. As it is injected into groundwater areas, the effects of the materials used on the environment must be known. Developing an eco-friendly, economical and low viscous acrylic gel which has a sealing effect on groundwater is therefore a significant task. At this point the study begins. Basic investigations with the rheometer and a reverse column experiment have been performed with different mixing ratios of an acrylic gel. A dynamic rheology study was conducted to determine the time at which the gel still can be processed and the maximum gel strength is reached. To examine the effect of acrylic gel grouting on determine the parameters pH value, turbidity, electric conductivity, and total organic carbon on groundwater, an acrylic gel was injected in saturated sand filled the column. The structure was rinsed with a constant flow and the eluate was subsequently examined. The results show small changes in pH values and turbidity but there is a dependency between electric conductivity and total organic carbon. The curves of the two parameters react at the same time, which means that the electrical conductivity in the eluate can be measured constantly until the maximum is reached and only then must total organic carbon (TOC) samples be taken.

Keywords : acrylic gel grouting, dynamic rheology study, electric conductivity, total organic carbon

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