

The Study of Mass Transfer Processes Under Dissolvent Rotation Conditions at Construction of Underground Reservoirs in Rock Salt

by

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2

Abstract

Development of a technology that enables solvent rotation, when rock salt is dissolved by water fed through wells, is the improvement area for traditional technologies and their further advancement.

This report presents numerical and experimental simulation of rock salt dissolution and cavern shape formation when rotation of feed solvent is employed.

Based on the mathematical simulation the mass-transfer mechanism on salt surface - rotating solvent of rock salt interface has been studied. A non-steady problem concerning convective diffusion in structure with cylindrical geometry and uniform rotation around its vertical axis has been discussed. The results of calculations of mass flow from dissolution surface and NaCl concentrations distribution in solvent volume are presented.

Experimental simulation was undertaken in laboratory where rock salt monolith was used. Solvent rotation was obtained by a special model device. The report discusses experimental results concerning the shape formation of modelling cavern under uniform rotation of solvent in a chamber.

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