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**Numerical Modeling
of Potash Solution Mining Caverns**

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Abstract

The paper describes the different requirements on a Computational Fluid Dynamics (CFD) model for potash solution mining operations compared to rock salt solution mining.

The implementation of the dissolution kinetics as well as the phase chemistry for both the equilibrium system $\text{KCl-NaCl-H}_2\text{O}$ and $\text{MgCl}_2\text{-KCl-NaCl-H}_2\text{O}$ will be discussed.

Furthermore the temperature development during leaching due to dissolution heat loss and/or heating of the cavern above deposit temperature is crucial for potash solution mining and has to be considered in such a model.

The paper will also discuss several approaches about turbulence flow inside the cavern.

The hard and software used and some calculation results will be provided.

Key words: Brine Chemistry, Cavern Development, Cavern Dissolution Modeling, Computer Modeling, Potash, Geochemistry, Solution Mining

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