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**Reactive transport modeling of $CO_2$ inside a fractured rock: Implications of mass transfer and storage capacity** MOHAMMAD ALIZADEH NOMELI, AMIR RIAZ, University of Maryland — A numerical model of geochemical transport is developed to evaluate long term mineral trapping of $CO_2$ inside a fractured rock. The problem contains flow of $CO_2$ between finite plates that represents a single fracture in post-injection regime. This study investigates the impact of fractures on $CO_2$ transport and storage capacity. The effect of surface roughness is also investigated to predict the actual efficiency of mineral trapping of $CO_2$ for a long period of time. The model is composed of direct numerical simulation tools and algorithms for incompressible flow and conservative transport combined with kinetics of corresponding chemical reactions. For each time step, transport and reactions are solved by means of finite difference method using a sequential non-iterative approach. It is found that the simple fracture is filled at the inlet because concentrations of carbonate ions are greater (more saturated states).

Mohammad Alizadeh Nomeli
University of Maryland

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