Dynamics of clogging in drying porous media\textsuperscript{1} C. NADIR KAPLAN, L. MAHADEVAN, Harvard University — Drying in porous media pervades a range of phenomena from brine evaporation arrested in porous bricks, causing efflorescence, i.e. salt aggregation on the surface where vapor leaves the medium, to clogging of reservoir rocks via salt precipitation when carbon dioxide is injected for geological storage. During the process of drying, the permeability and porosity of the medium may change due to the solute accumulation as a function of the particle concentration, in turn affecting the evaporation rate and the dynamics of the fluid flow imposed by it. To examine the dynamics of these coupled quantities, we develop a multiphase model of the particulate flow of a saline suspension in a porous medium, induced by evaporation. We further provide dimensional arguments as to how the salt concentration and the resulting change in permeability determine the transition between efflorescence and salt precipitation in the bulk.

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