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Limits to the sealing capacity of Halite

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The presence of salt has a major control on the tectonic evolution of sedimentary basins, because of the rheological contrast with the surrounding sediments. In addition, evaporites have a strong control on fluid flow in a basin, becuase of their very low permeabilities and ductility. Although salt is widely regarded as a perfect seal, it can become permeable for one- or two-phase fluids under certain conditions of fluid pressure, temperature and deviatoric stress. The fluid pathways can be either along zones of diffuse grain boundary dilatancy, or along open fractures, depending on the fluid overpressure and deviatoric stress. We present a number of case studies where Halite can be shown to have been permeable. The fluid can form Halite veins visible in samples decorated by Gamma-irradiation, or networks of brine-filled grain boundaries which conduct fluid from primary inclusions during recrystallization. In al cases the main criterion for this to occur is the presence of near-lithostatic fluid pressures, which allow dilatancy and a dramatic increase in permeability.