

Aqueous fluid infiltration into quartzite: implications for element redistribution and rock texture development by porous flow

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Fluid infiltration driven by interfacial energy affects fluid flow velocity and permeability of rocks. Piston-cylinder experiments have been performed to investigate the kinetics of fluid infiltration into quartzite. Infiltration couples composed of pre-synthesized quartzite and water reservoir were heated at 8kb and 600-900C. The infiltration rate in dry quartzite at 800C is 120 micron/hr. Infiltration of NaClaq is faster than pure water, while that of COH fluid is slower, suggesting an important role of dihedral angle. Coarsening of quartz grain can be observed in the infiltrated part. The infiltration and coarsening occur through dissolution and recrystallization mechanism. Porosity in the infiltrated part reaches around 1% which is close to the equilibrium porosity.