

Effect of chemical environment on frictional healing

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We conducted slide-hold-slide friction experiments with various pH aqueous solutions.

Rock specimen is Inada Granite. The granite sliding surfaces were roughened with #120 abrasive. pH was controlled by adding HCl.

Experiment was conducted under constant normal stress of 5MPa. Shear stress is held constant during hold period (30~3000 s). Slip rate is 0.002 mm/s.

Log linear relation between peak stress and hold time are observed. We found that healing rates decrease with decreasing pH; 0.0030 per decade at pH6.3, 0.0012 per decade at pH3.2, and 0.00064 per decade at pH2.3 in the range of the hold time conducted in our experiments.