



Fluid infiltration associated with seismic faulting: Evidence from magnetic properties of fault rocks from the active Longmenshan fault zone, China

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Fluid-driven processes in fault zones are of importance because they not only play an important role on chemical and mineralogical composition, and textural evolution of fault zones, but also have a major impact on mechanics of faulting. After the 2008 Mw 7.9 Wenchuan earthquake in Sichuan, China, a shallow hole was drilled and penetrated into the Yingxiu-Beichuan fault, which is one of the four major faults of the Longmenshan thrust belt, and was the major ruptured fault zone during the earthquake. Different fault rocks, including fault breccia, cataclasite and fault gouge, were cored. Magnetic measurements showed that the three gouge zones with different colors have quite different magnetic properties. Diverse mineral assemblages and chemical compositions have also been identified for them. Here we will report the detailed magnetic properties of these three fault gouge zones and their relationship with mineral assemblages and chemical compositions. Possible causes associated with fault fluid for diverse magnetic mineralogy of the three fault zones will also be discussed. Results suggest that mineral magnetic properties of fault rocks could be expected to yield insights into the rock-fluid interaction processes within fault zones.