

Evaluation of reactivity under hydrous condition on thermal maturity of carbonaceous materials as a proxy of seismic slip

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The thermal maturity of carbonaceous materials (CM) is often used for evaluation of the frictional heat recorded in faults. However, despite the fault is filled with water, the effect of water on the maturity of CM have not yet been investigated. Thus, here we performed heat treatments on lignite and bituminous coal with some different conditions of CM-water ratio, target temperature, heating rate, and heating holding time, and then evaluated the effect of water. The spectroscopic features by IR and Raman on the heated CMs with various conditions indicated no difference on the maturation (e.g., thermal breaking of aromatic C-H and graphitization). Therefore, the thermal maturation of CM as a proxy for frictional heating in faults is not necessary to consider the presence of water.

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