

Characterization of carbonaceous materials in the Taiwan Chelungpu fault by micro Raman-FTIR spectroscopies

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Coseismic slip during an earthquake induces frictional heating in fault zone. Determination of the temperature recorded in the fault is important for estimating the dynamic shear stress and displacement during the earthquake. Here we performed micro Raman-FTIR spectroscopic analyses of carbonaceous materials from the Taiwan Chelungpu fault, which slipped at the 1999 Chi-Chi earthquake. We also conducted heat experiments and high-velocity friction experiments and analyzed by Raman-FTIR spectroscopies in order to investigate the effects of fast heating rate like frictional heating during earthquake. Based on the results of analyses, we discuss the capability as new temperature proxy during the earthquake.

Keywords: Taiwan Chelungpu fault, carbonaceous materials, Raman spectroscopy, FTIR spectroscopy