

## Characteristics of frictional heating related thermal maturation of CM: Raman analysis of CM in the fault rocks

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Determination of frictional heating effects along faults provides key insight into the dynamics of earthquakes and faulting. Raman spectroscopy has recently been used to estimate the thermal metamorphic grade of organic matter in sedimentary rocks and applying the method in order to estimate the temperature of fast heating like frictional heating during earthquake. We conducted Raman spectroscopic analysis of CM in the fault rock of three major thrusts [2.5-5.5 km depth of ancient mega-splay fault (an out-of sequence thrust in the Shimant accretionary complex), 1-4 km depth of a thrust in the Emi group, Hota accretionary complex and the Chelungpu fault, which slipped at the 1999 ChiChi earthquake]. Heating experiment of CM in the host rock of faults described above were also conducted and these Raman spectrum were analyzed in order to investigate the effects of fast heating rate like frictional heating.

Evolution of Raman spectrum of the short time matured experimented CM was differ from the diagenetic matured CM. This result shows that the existing Raman CM geothermometer is not applied for temperature estimation of short time matured CM in the fault rock.

In this presentation, we introduce the difference of characteristic of Raman spectrum of short time matured CM and diagenetic matured CM. To evaluate the levels of friction, Raman spectrum of the short time matured experimented CM is useful as calibration tool.

Keywords: Raman spectroscopy, carbonaceous material, frictional heat