

Decreasing of inorganic carbon content of fault-related materials by frictional heating during an earthquake

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Frictional heating during an earthquake can trigger thermal decomposition of carbonate minerals in fault-related material. However, the mechanism and kinetics of the reaction have not been well understood. To understand the mechanism and kinetics and to estimate maximum temperature on the fault during an earthquake, we performed heating experiment and carbon content analysis. We first simulated the temperature change over time caused by frictional heating in electrical furnace. We then analyzed total carbon contents of the samples after heating, showing the result of lower content of total carbon with higher maximum temperature heated. This could indicate that the thermal decomposition of carbonate mineral occurred. However, the content of total carbon corresponds not to that of inorganic carbon but also to organic carbon and graphite. In order to determine only the inorganic carbon content, we are now developing the method using gas-cell infrared spectroscopy to measure it.