

Magnetic petrology of the Hawaiian 1960 lava - trial estimation of equilibrium temperatures of the Fe-Ti oxides

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Recently, reliability of the Thellier method (Thellier and Thellier, 1959; Coe, 1967) has began to be claimed. This is because it has occasionally given incorrect paleointensities from historic lavas. The examples are the Mt. Etna lava (Calvo et al., 2002), the Oshima lava (Tanaka et al., 1995; Mochizuki et al., in press), and the Hawaiian lava (Tanaka and Kono, 1991; Hill and Shaw, 2000; Yamamoto et al., 2003). There are several possible causes suggested, but a problem related magnetic grain sizes is a main stream (e.g. Kosterov and Prevot, 1998; Calvo et al., 2002; Biggin and Thomas, 2003).

However, Yamamoto et al. (2003) proposed that the incorrect paleointensities from the Hawaiian 1960 lava could be attributed to acquisition of thermochemical remanent magnetization (TCRM) in its natural cooling stage. In this talk, I will semi-quantitatively discuss this possibility by estimating equilibrium temperature of coexisting Fe-Ti oxides in each specimen based on the geothermometer by Ghiorso (1997).