

SEM036-10

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Geomagnetic field intensity inferred from 4-6 Ma lava sequences in Sudurdalur area, Iceland

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Paleomagnetic core samples were collected from 489 lava flows distributed in different four regions in Iceland. The collections were done in 1993 and 1994 by Masaru Kono, Hidefumi Tanaka and others. One of the regions was the Sudurdalur area. In the area, samples were taken from two sections of MA and MB which are about 10 km distant from each other. The sections MA and MB consist of 47 and 52 lava flows, respectively. These samples were studied by Udagawa (1997 MS) for K-Ar ages and by Kitagawa (1998 MS) for paleomagnetic directions. Udagawa (2000 DS) integrated these results and interpreted that magnetostratigraphy recorded in the MA and MB sections could be correlated to the duration between Chron C3An.1n and Cochiti Normal Subchron. This corresponds to the duration between 4.187 and 6.252 Ma based on the geomagnetic polarity time scale by Lourens et al. (2004). In the present study we have performed absolute paleointensity measurements on these samples using the LTD-DHT Shaw method.

Prior to the paleointensity measurements, hysteresis and thermomagnetic properties were investigated for each one chip sample from every lava flows. Considering these properties, samples from 41 lava flows of the MA section and 36 lava flows of the MB section were subjected to the paleointensity measurements. The measurements were made on 145 (MA) and 117 (MB) individual specimens. Selection criteria discriminated 82 (MA) and 58 (MB) successful results. Further statistical criteria ((1) not less than three successful results were obtained from a flow; (2) a standard deviation calculated from these successful results is within 15 per cent of the flow average) yielded 18 individual virtual dipole moments, giving an average of 3.88×10^{22} Am² with a standard deviation of 1.86×10^{22} Am². This is about a half of the present geomagnetic dipole moment, and not contradict from an average VDM of 3.20×10^{22} Am² (N=23) obtained from 0.5-4.6 Ma volcanic rocks in southern hemisphere by the LTD-DHT Shaw method (Yamamoto and Tsunakawa, 2005; Yamamoto et al., 2007).