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Chemical magnetization when determining Thellier paleointensity experiments in oceanic basalts

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The natural remanent magnetization (NRM) of oceanic basalts selected in the rift zones of the Mid–Atlantic Ridge (MAR) and the Red Sea has been explored. Laboratory simulation shows that the thermoremanent magnetization and chemical remanent magnetization (CRM) in oceanic basalts may be separated by using Tellier–Coe experiment.

It was found that the rate of CRM destruction is about four times lower than the rate of the partial thermoremanent magnetization formation in Thellier cycles. The blocking temperatures spectrum of chemical component shifted toward higher temperatures in comparison with the spectrum of primary thermoremanent magnetization.

It was revealed that the contribution of the chemical components in the NRM increases with the age of oceanic basalts determined with the analysis of the anomalous geomagnetic field (AGF) and spreading theory. CRM is less than 10% at the basalts aged 0.2 million years, less than 50% at basalts aged 0.35 million years, from 60 to 80% at basalts aged 1 million years [1].

Geomagnetic field paleointensity (H_{pl}) has been determined through the remanent magnetization of basalt samples of different ages related to Brunhes, Matuyama and Gauss periods of the geomagnetic field polarity. The value of the H_{pl} determined by basalts of the southern segment of MAR is ranged from 17.5 to 42.5 A/m, by the Reykjanes Ridge basalts — from 20.3 to 44 A/m, by the Bouvet Ridge basalts — from 21.7 to 34.1 A/m. VADM values calculated from these data are in good agreement with the international paleointensity database [2] and PISO–1500 model [3].

Literature

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