



Extremely low palaeointensities in the Neoproterozoic obtained on volcanic rocks from the Ukrainian shield

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More than 100 samples of basalts and tuffs of the Vendian extrusive from the Volhynia region of the Western Ukraine (51.23° N, 26.05° E) have been collected and studied. The samples were taken from three basalt flows and two tuffs stratum. They belong to Ratnenskaya suite of Volhynian series with K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ age determinations pointing to the age of 550-590 Ma. Thermal and AF demagnetization of NRM indicate that the ChRM component is carried mostly by high coercivity minerals with unblocking temperatures T_{ub} of about 570°C while some samples have lower coercivity with T_{ub} about 450°C. The ChRM components often decay to the origin of orthogonal plots indicating its primary origin. The basalt flows from one site are characterized by dual polarity with the palaeomagnetic directions (N=12; D=294.7°, I=82.8°, k=29, α_{95} =7.9°; N=16, D=49.4°, I=-81.4°, k=152, α_{95} =3.0°) and mean palaeomagnetic pole Φ =46.0°; [$U+0.245$]=7.2°. From the other site (N=21; D=30.6°, I=-77.2°, k=120, α_{95} =2.9°) the mean palaeomagnetic pole is Φ =29.0°; [$U+0.245$]=12.1°. Both palaeomagnetic poles are close to those of calculated by Nawrocki et al., 2004; Elming et al., 2007 on the same basalts of Volhynia region. Palaeointensity determinations were made on samples from 2 sites carrying well-identified ChRM-components using the Thellier-Coe (with pTRM checks) and Wilson protocols. Palaeointensity determinations were successful on 25 thermostable SD/PSD magnetite samples yielding extremely low palaeointensities (1.5-8.8) μT with corresponding VDM values = (0.36-0.94) (10^{22} Am²) what suggests that the geomagnetic field was unusually weak at this time and probably multipolar. These unusual feature of the geomagnetic field again raise the question about the time of solid core nucleation (Shcherbakova et al., GJI, 2017). The work was partly supported by RFBR grant 16-05-00446 and Ministry of Education and Science of the Russian Federation (grant 14.Z50.31.0017).