LOCALIZATION OF PLASTIC DEFORMATIONS AT DIFFERENT HIERARCHY LEVELS AND THEIR CONNECTION WITH MAGNETIC PARAMETERS VARIATIONS OF THE KONDER MASSIF PLATINUM-BEARING DUNITES

PETER MARTYSHKO 1, Valentin Pyankov 2

1. Institute of Geophysics Ural Branch of RAS, Yekaterinburg, Russia, e-mail: pmart3@mail.ru
2. Institute of Geophysics Ural Branch of RAS, Yekaterinburg, Russia, e-mail: v_pyankov@mail.ru

The Konder massif is represented a pipe-like mantle body that intruded the Archean crystalled basement of Aldan Shield. The rounded dunite body of 5.5 km in diameter is bordered with a pyroxenite zone about 150-200 m of width. This dome-like structure was probably formed because of diapiric intrusion of solid and hot dunite-pyroxenite body. With the purpose to study both geomagnetic zonality and features of formation of the Konder massif, we investigated magnetic properties of dunite for more than 150 samples, selected on three radial profiles under corners approximately 120^0 to each other. An attempt to establish statistical connection between magnetic susceptibility χ, remanent magnetization I_n of dunite and distance of sampling points from contact with pyroxenite ring has been undertaken. Magnetic susceptibility values χ for three profiles depend on distance and have multiextreme character (the contact dunite-pyroxenite is accepted as zero point). The first from the pyroxenite ring maximum reaches the greatest value (~ 0.01 unit SI). Further, with increase of distance from periphery of the dunite massif, amplitudes of extremes naturally decrease. Variations of remanent magnetization of dunite I_n are in an antiphase with spatial changes of magnetic susceptibility χ, that is minimum of I_n corresponds to maximum of χ. The mineral grain size varies from fine to medium and large from periphery of dunite core to its center. It is possible to interpret process of its emplacement as a combination of rolling and extrusion. We observed thin structure of conjugate deformation bands in zones of minimum values of χ, magnitoaccoustic emission and coercive force H_c for "massive" dunites. The "massive" dunites" characterize high density of defects ρ (plastically deformed zones), because $H_c \sim \sqrt{\rho}$. Thus, variations of magnetic properties of rock are an indicator of localization of plastic deformation at different hierarchy levels.

plastic deformation, magnitoaccoustic emission, dunite

Peter Martyshko, Institute of Geophysics Ural Branch of RAS, 620016 Yekaterinburg, Russia, Amundsen str. 100., tel: +73432678868, fax: +73432678872, e-mail: pmart3@mail.ru