

AMS of deformed hematite in torsion

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Abstract: We present results of AMS and rock magnetism of hematite ore samples deformed in HTP-torsion. The hematite samples (98 % Fe₂O₃) are taken from the three blocks from the Superior-type banded iron formations (BIFs) from the Sishen Mine, South Africa (Siemes et al., 2011). The blocks are characterized by variable grains size: fine-grained block (<5µm), coarse-grained block (≈17µm) and block of alternating layers of different grain size (<5µm and ≈10µm). Drilled samples from the blocks were subjected to torsion experiments that were performed at 400 MPa confining pressure, constant temperatures 950 or 750 °C with constant strain rate between $0.34 \times 10^{-5} \text{s}^{-1}$ and $4.4 \times 10^{-5} \text{s}^{-1}$. The finite shear strains ranged between $\gamma = 0.7$ and $\gamma = 4.5$. The samples from the torsion record the strain gradient therefore we have cut them in several small samples following the gradient. The samples measured for AMS and rock magnetism show high magnetic susceptibility in order 10^{-3} . The AMS is generally characterized by the oblate shape of ellipsoid and a progressive increase of AMS intensity coupled with increased shear strain. The directional parameters record the destruction of an old original fabrics and development of a new fabric pattern. The strain steps are compared with magnetic fabrics in detail.

Keywords: AMS, hematite, experiments

References :

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