Dinamical deffects and morphology of a mineral individuals

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Ontogenetic analysis of an anatomy of the mineral individual

Constantly the real crystal lattice is different from an ideal one, it contains defects and dislocations. Defects occur at all stages of ontogeny development of a grain. It is a disorder of translation centers of a planer grid of an elementary cell. Defects are presented by vacations or the position of the vacation could be occupied by ions or its complexes.

All dislocation has ability to migration in the crystal lattice volume, because of the quantity energy differences consumed during formation and existence. Transformation of the points defects into lineal or transformation of the one-dimensional defects into the two-dimensional reduces the total energy of a crystal and can be considered as a dynamical dislocation. Thus, aggregation of defects satisfies a condition of energy minimization. It is a way of a refining or a purification of the crystal lattice of the mineral individual from dislocations and impurities.

A grain or a crystal boundary is also a dislocation – a edge dislocation. It is a buffer zone between the lattice energy and the matrix energy (the aggregate energy) in which the crystal was occurred and was grown. Consequently, while the dislocation energy of crystal lattice is changing, the boundary energy is transforming also. Any energy changing of a crystal boundary leads to the morphology transformation.

We are succeeded in validating of these theoretical statements on different levels of the mineral matter organization.

Results and Discussions

During the monomineral quartz aggregate microscope studding we determinate several types of the quartz individuals, differing from each other by the internal fabric – anatomy and morphology. To obtain more information a Cathodoluminescence analysis, EBSD analysis and quantity estimation of defects by the special Mineralogical integration devise were done. All gained results reveal one tendency for all studied rocks and it helps us to confirm the dislocation dynamics influence to morphology of the mineral aggregate.

[1] Brodskaya R., Götze J., Kotova E., Heide G. Analysis of vein quartz individuals and aggregates and quantity estimation oft he quartz raw matierial //Zapisky of RMO. 2015. №1. P. 93-100