The X-ray Reflectometry and the Phase Contrast Methods for Crystal Analysis

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The X-ray phase contrast method [1] provides high resolution visualization of the internal structure of low absorbing substances with flat density gradient. This method can also be used for the study of refraction index changing processes, e.g. crystal growth. NaCl solution, where the same crystals are grown, has been used as an investigated object. The results of experiments were the density gradient of the near-surface region around the growing crystals and the width of the intermediate layer.

The X-ray reflectometry methods provide estimating the physical and geometrical properties of the near-surface region of the crystals with a high accuracy. These methods are based on the measurement of the reflectance within the small angles of the incidence area (in and near the complete external reflection area). NaCl monocrystals have been used as investigated objects. Crystal faces quality after splitting, short and long time processes of solution and growth have been estimated.

[1] Bushuev V.A., Petrakov A.P., *Crystallography*, 2001, **46**, N 2, 209-214. **Keywords: x-ray crystal analysis methods, x-ray reflectometry, x-ray crystallography**