
Double-crystal topography in the Bragg case was performed using synchrotron radiation and the new double-axis X-ray diffractometer (Nucl.-Instr. and Meth., 190, 593 (1981)) installed at DORIS II/HASYLAB. With this instrument the reflection line of the double-crystal set C1 (reference crystal)-C2 (sample crystal) can be rotated continuously with respect to the reflection planes of the monochromator (two independent perfect Si crystals). Rotation axis is the beam incident on C1. It is thus possible to align the whole topographic set-up (crystals C1, C2, two monitor detectors and the film cassette) in the Bragg geometry for a given φ angle on the inner bench of the diffractometer. The rocking curve is the high-resolution angle of the reflecting plane C1-C2 with respect to the polarization plane of the primary beam by rotating the bench about the monochromatic beam direction. For such a variation of φ, changes of the rocking curves widths (fRC when rocking C1 and φ when rocking C2) and changes of the penetration depth r of the beam during the reflection process have been predicted (Nucl.-Instr. and Meth., 208, (1982)) when rocking of the strong φ-dependence of relative φ and φ contributions to the total reflecting power of the crystals. The effects should be the more pronounced with higher exposition depth and that the degree of strain hardening governs the magnitude of, residual strains. Extending the results of single crystal studies and CARCA method (Yazici, Hayo, Takemoto & Weissmann, J. Appl. Cryst. (1983) 16, 293), it is possible to determine the distribution of elastic and plastic strains emanating from stress raisers. The determination of elastic strains is made by measurements of reflected intensities and results on the theory relating the integrated reflectivity to lattice curvature. The theory covers the entire range from zero to infinity and takes into account, anomalous transmission and crystal anisotropy (Z. H. Kalman & S. Heissmann, J. Appl. Cryst. (1983) 16, 293). Using silicon as model material, strain gradients and strain distributions were measured from bent crystals containing strong radial, the results were compared to calculations based on continuum mechanics. Good agreement was obtained between experiment and theory. The distribution of plastic strains is determined by double crystal diffractometry using a computer-aided rocking curve analyzer (CARCA). The plastic strains connected with the crystal growth. Strains connected with the crystal growth.


Electrical conductivity relation to temperature of real crystals where

\[ G = \sum_{i} B_{i} e^{\frac{-E_{i}}{kT}} \]

in real crystals where \( B_{i} < E_{1} \leq \cdots \leq E_{n} \) though it is stated valid for ideal non-metal crystals. The cause of this is seen in processes of recapture of charge carriers by some defect trap levels as well as in chemical and physical transformations and in effects of concentration and charge gradients.

Studies have been made on Y\(_{3}\)Al\(_{2}\)O\(_{12}\) and on \((T\text{Re})_{x}Y\text{Al}_{y-1}\)Al\(_{2}\)O\(_{12}\) obtained by horizontally directed growth technique \((T\text{Re} = Dy^{3+}, Lu^{3+}, \text{or } Eu^{2+})\).

Optical absorption spectra of these crystals in the range of 400-50000 cm\(^{-1}\) may be understood in known scientific graphology. The fine structure of Dy\(^{3+}\) spectrum (local symmetry \(T_{d}\)) is thought to be conditioned by forbidden transitions in the 4f-shell. The broad absorption bands observed at heterogeneous substitution \(Y^{3+} \rightarrow \text{Ba}^{2+}\) are in agree-