PS17.00.13 LOCKING CONFIGURATION OF DISLOCATIONS IN $A_{III}B_V$ SINGLE CRYSTALS. Marian R. Surowiec, University of Silesia, Institute of Physics and Chemistry of Metals, 40007 Katowice, Bankowa 12, Poland

X-ray topography investigations of dislocations generated by compression of InSb and by microindentation of InSb and GaAs single crystals revealed that dislocations glide parallel to the $(\overline{111})$ surface and react in the $(\overline{111})$ plane. The present paper proposes possible explanation of reaction between dislocations belonging to two neighbouring wings (fig.1). For the node I reaction resulting in junction formation leeds to Lomer-Cottrell

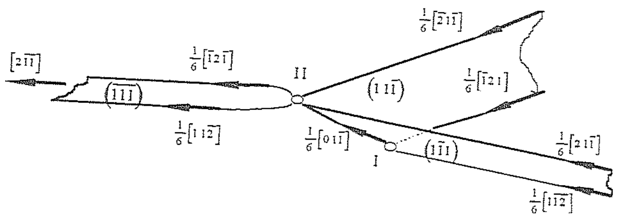


Fig.1. Formation of the new type of locking configuration as a result of reaction between two dissociated dislocation loops. Arrows denote directions of dislocations with indicated Burgers vectors.

lock formation: $\frac{1}{6}[1\bar{1}\bar{2}]+\frac{1}{6}[\bar{1}21]\rightarrow\frac{1}{6}[01\bar{1}]$

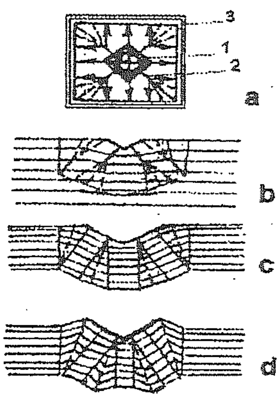
Ingoing dislocations at node II give: $\frac{1}{6}[01\bar{1}]+\frac{1}{6}[21\bar{1}]+\frac{1}{6}[\bar{2}1\bar{1}]\rightarrow\frac{1}{2}[01\bar{1}]$

i.e. the same result as outgoing dislocations: $\frac{1}{6}[11\bar{2}]+\frac{1}{6}[\bar{1}2\bar{1}]\rightarrow\frac{1}{2}[01\bar{1}]$

The new type of locking configuration consists of a stacking foult ribbon in $[\bar{2}11]$ direction and a Lomer-Cottrell lock between node I and node II.

PS17.00.14 MICROSTRUCTURE AND TEXTURE OF DEFORMED ZONE BY INDENTATION. D.Z.Grabko, M.I.Medinskaya, Yu.G.Saltanovsky Institute of Applied Physics, Academy of Sciences, Kishinev, Moldova

The microstructure of hardness indentation surface and texture of the deformed zone under it were investigated on (001) plane of KCl, NaCl, NaF, LiF, MgO single crystals. The loads on the Vickers pyramide P = 0.02 -2 N. Deformation temperature interval $T_{def} = 77\div800$ K. At low $T_{def} < 0.3T_{melt}$ the characteristic cracks on indentation surface were revealed (Figure a,1). Their origin as well as cracks along <110> direction outside the indentation have dislocation nature. P growth led to the increase of cracks number. The cracks number decreased with T_{def} growth and the displacement steps appeared instead of them. On the whole their arrangement repeated the indentation orientation. It signifies that frail destruction and plastic displacement take place during indentor deepening into the crystal and arise as a result of very high inside stresses. Cracks along <110> and sliding strips around indentation (Figure a, 2,3) also have relaxation nature. But their appearance is connected with stress relaxation after indentor removal.



Texture of deformed zone under indentation also testifies of unhomogeneous flow of plastic deformation (Figure.b-d). The investigated crystals can be divided as to their texture shape into two types: soft and hard ones. In dependence of the T_{def}, one and the same crystal shows properties of either hard ($T_{def}<0.3T_{melt}$) or soft ($T_{def} >0.3T_{melt}$) crystals. A peculiar pressing figure, the destruction zone (Figure.b-d) appears in the region under indentation side by side with very good developed and in detail investigated dislocation zone. The dimension of this destruction zone is $D\approx2\div3\ d_{ind}$. The most complicated dislocation reactions, leading to the material translation, rotary processes, structure fragmentation etc., take place in this region by indentation.

PS17.00.15 REAL STRUCTURE AND ANOMALOUS OPTICAL PROPERTIES OF STRONTIUM TITANATE CRYSTALS. A.F. Konstantinova, L.A. Korostel' and S.N. Sulyanov. Institute of Crystallography, Russian Academy of Sciences, Leninsky pr. 59, Moscow 117333, Russia

The new defect (Ti(3+)-Vo complex) has been revealed in SrTiO3 crystals. The optical absorption at 620 nm, anomaly of ESR spectrum near the structure phase transition and luminescence at 645 nm have been associated with this defect. The model of this complex has been proposed. Absorption bands at wavelengths of 430 and 520 nm have been found in SrTiO3 crystals containing "blue spot" defects. These defects have been associated with the transition of some of the Ti(4+) ions to Ti(3+) state as well as with oxygen vacancies (Vo).

The powder patterns were found to contain additional very weak peaks (maximum intensity about 0.1% of that of the strongest 110 line) which in combination with all peaks of the cubic lattice presumably can be indexed in tetragonal unit cell. We suppose that the oxygen vacancies can make up some superstructure. Anomalous dichroism and birefringence have been detected. The dependence between the optical properties and real structure connected with oxygen non-stoichiometry has been determined. Such complexes as Vo, Ti(3+) ions, Ti(3+)-Vo clusters as well as doped clusters are supposed to form some additional order which can explain abnormal anisotropic optical properties of SrTiO3.

PS17.00.16 DELINEATION OF DEFECTS IN FLUX GROWN STRONTIUM HEXAFERRITE CRYSTALS. P.N. Kotru, Urvashi Raina and Sushma Bhat, Dept. Of Physics, University of Jammu, Jammu, India and F. Licci, Instituto MASOPECCNR, via chiavari 18/A, 43100 Parma Italy

Results of etching (0001) planes of flux grown strontium hexaferrite crystals in 85% H_3PO_4 at 120°C and 37% HCl at 100°C are presented. Fractography reveals one to one correspondence of cleavage patterns on the two matched (0001) cleaved planes. Experiments on successive etching of grain boundaries established H_3PO_4 and HCl under the above given conditions as the dislocation etchants. Several types of etch pit structures are illustrated. It is explained that they are indicative of normal, inclined, stepped and bending dislocations in these crystals. Pit structures due to impurity inclusions are discussed. The explanations are supported by the results of mismatchings of etch patterns on matched cleavages.