11.1–9 DOMAIN STRUCTURE IN ROCHELLE SALT REVEALED BY X-RAY PLANE-WAVE TOPOGRAPHY. By K.Ishida, K.Umezawa, M.Kawata, T.Ogawa and S.Takagi, Faculty of Science and Technology, Science University of Tokyo, Noda-shi, 278, Japan.

Domain structures in (001) plate of Rochelle salt has been studied by the plane-wave X-ray topography(K.Ishida, K.Umezawa, M.Kawata and S.Takagi, J.J.A.P.1983,22,L25-27) In ferroelectric phase a very small split of the diffraction direction has been observed in the rocking curve indicating slight inclination of the c-axis due to existence of the domain structure. The split, $\Delta\theta$, shows temperature dependence represented by $\Delta\theta = k(T_c - T)^{1/2}$ below T_c, the upper transition temperature, where k=50[sec.$K^{-1/2}$] for 080 reflection with MoKα_1.

Abrupt change in the contrast in projection topographs upon the phase transition has been observed, though the image which directly indicate the domain structure has not yet been observed. Section topographs give contrast of b- and c- domains, b-domain consisting of twin lamellae parallel to (001) and c-domain to (010). Section topographs of b-domain taken at the two peaks of 080 reflection show dark and bright bands which are reversed at each peak, those of c-domain fine stripes originated from domain walls. These patterns disappeared in the paraelectric phase and another contrast appeared which were caused by distortions in the crystal surface. Projection topographs of the ferroelectric phase give a maze-like pattern in regions of b-domain. The pattern may be formed by the interference between reflections from successive layers of the lamella structure parallel to the crystal surface. For a (100) plate a domain structure which coincides with the observation by Mitsui and Fuichi by polarized light(Phys.Rev.1952,90,193) has been observed by the ordinary Lang method.

11.1–10 X-RAY TOPOGRAPHIC INVESTIGATION OF THE DEFECT STRUCTURE AND DECOMPOSITION OF CALCIUM COPPER ACETATE HEXAHYDRATE. By D. Götz and H. Klapper, Institut für Kristallographie der RWTH Aachen, 5100 Aachen, FRG.

Calcium copper acetate hexahydrate, (CH3COO)4CaCu·6H2O, crystallizes in the tetragonal space group I 4/m,a=1.1152 nm, c=1.6240 nm (Langs&Hare, Chem. Commun. (1967) 3, 890; Klop,Duisenberg&Spek, Acta Cryst. (1983) C39, 1342). The structure consists of chains of alternating Ca and Cu coordination polyhedra along [001] which are linked by water hydrogen bonds. This leads to a perfect cleavage parallel {110} and a less perfect one parallel {100}. Large blue crystals up to 20x20x22 mm size were grown from a (4:1)-mixture of (CH3COO)2Ca·H2O and (CH3COO)2Cu·H2O from aqueous solution. X-ray topographs of (100), ($\bar{1}$10) and (001) plates show high crystal perfection with only few dislocations. The Burgers vectors are b= <100>,<110> and <001>. Dislocation movements with the slip system ($\bar{1}$10) [110] were observed. This will be discussed from a structural point of view. The boundaries between the growth sectors {100},{110},{101} and {001} exhibit strong kinematical or dynamical contrast. The pronounced growth striations in the {101} sectors indicate considerably higher impurity incorporation on {101} growth faces than on other faces. Series of topographs and optical photographs at elevated temperatures reveal that the 'decomposition' of (CH3COO)4CaCu·6H2O at 85 °C actually consists of a solid-state reaction to the two compounds (CH3COO)2Ca·H2O and (CH3COO)2Cu·H2O with evaporation of excess water as verified by powder diffraction and DTA. The reaction starts at about 5 °C below the decomposition temperature, predominantly at crystal defects causing high strain. By approaching the transition temperature "islands" of reaction products grow slowly and coalesce until the whole crystal is transformed.

11.1–11 THE SECTION TOPOGRAPHY WITH PLANE WAVE X-RAY. By K. Ishida, Y.Kobayashi, H.Katoh & S. Takagi, Faculty of Science & Technology, Science Univ. of Tokyo, 278 Noda-shi, Japan

In a section topograph by the usual condition with a fine focus source and a fine slit just before a specimen, the hot margin effect is always observed. The effect is interpreted by the spherical wave theory (Kato,Acta Cryst.(1961) 14, 526; 627). We have taken section topographs with (+, +, -) setting (Ishida, Kobayashi & Kato, Phil. Mag. A, (1984) 49, L1). The first crystal is a symmetric reflector, the second, an asymmetric reflector and the third, the specimen which is a wedge shaped Si crystal. The width of the slit is about 20 µm. By the arrangement of the crystals and the slit, the divergent of the incident beam is estimated as 0.7 sec. for 220 with Mo Kα-1. When an incident beam satisfies the exact Bragg condition, i.e. W = 0, the section pattern taken by the transmitted wave is made up of hyperbolic contours and of a straight line which forms one side of the trianglar pattern, while the other side which corresponds to the energy flow parallel to the reflected beam is not observed. The pattern taken by the reflected wave is made up of hyperbolic contours and the hot margin is not observed. When W is not 0, the pattern is composed of hyperbolic contours and two straight lines on both sides of the triangle, i.e. hot margin. These experimental results are interpreted by the plane wave theory and well agree with the computer simulation based on the dynamical theory (Takagi, Acta Cryst. (1962) 15, 1311; J. Phys. Soc. Japan, (1969) 26, 1237).

11.1–12 MAGNETIC DOMAIN STRUCTURE IN (111) ORIENTED Fe-Si BY XSR TOPOGRAPHY. By W. Graeff and K. Wieteska*, Hamburger Synchrotronstrahlungslabor HASYLAB at Deutsches Elektronensynchrotron DESY, Hamburg, Germany.

Synchrotron radiation (DORIS, Hamburg) is used in reflection and transmission topography to study the magnetic domain pattern in a (111) oriented grain of Fe-3wt% Si. Some kind of domain structure, more or less stable in time, is observed in the state without any external field applied. Direction of the visible lines is often a continuation of stripe domain pattern observed in neighbouring grains of different orientation. In two cases the most distinct image of the lines and bands lying in ⟨211⟩ directions is analized. The lines most stable in time shown in the figure begin at the boundary of the grain. Prolongation of the direction of these lines in the neighbouring (001) oriented grain is [100] direction which is also the direction of close spaced stripe domains. The strain field due to a surface defect is visible near the grain boundary. Stress concentration and magnetic charges which can occur at grain boundaries may facilitate the nucleation of the domains in the neighbouring (111) oriented grain. A set of the topographs needed as well as section images were taken to determine the observed magnetic structure. Analysis of the x-ray diffraction contrast changes shows that the lines are traces of the 90° magnetic domain walls crossing the sample perpendicular to the surface.

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