07.1-11 INFLUENCE OF TEMPERATURE CHANGES ON SUCROSE CRYSTAL HABIT.

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One of the basic features of crystals is the anisotropy. The crystal growth rate is too anisotropic: in different crystallographic directions the growth rate is different. The object of this work was to determine the sucrose growth rate in different directions when the temperature changes for those solution concentrations where the mass growth rate is maximum (see /1/ and /2/).

The crystal growth tecnique is described in /3/ and /4/ with the particularity that to obtain the values of growth rate in each direction, the cystal were suspended perpendiculary to each principal direction: [100], [010] and [001].

We show the results related to growth rate in the direction [100], the slowest in the crystals. We observed that relative rates changes in different direction were not constant when the temperature changes; this means a change in the crystal habit when the temperature changes (see the following table).

T C \ Direction	[100]	[001]	[010]
35	1	1.22	2.46
40	1	1.08	2.22
45	1	1.07	2.16
50	1	1.10	2.16
55	1	1.13	2.19
60	1	1.16	2.21

We also observe that in extreme temperatures (35 C and 60 C) occurs a stretching in the axis b and c which is not due to any strange agent in the solution.

These results are important in sugar cooling crystallization when the solution temperature sweeps this temperature range.

/1/ Wong M., Ameneiro S., IX Seminario Cientifico del CENIC, 1985, CUBA.
/2/ Wong M., Alegret I, Memorias de la XI Conferencia de Quimica, Univ.Ote., 1985, CUBA.
/3/ Ameneiro S.,Rev.Cubana de Fisica,Vol. IV,1,1984,129-144.
/4/ Ameneiro S., XV Cong.Latinoamericano de Quimica, Puerto Rico, 1982, Libro Resumenes, pag.203.

07.1-12 DYNAMICAL OBSERVATIONS OF DENDRITIC GROWTH OF ALUMINUM-MAGNESIUM ALLOY SINGLE CRYSTALS BY REAL TIME X-RAY TOPOGRAPHY,

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Real time x-ray topography has been applied to study the dendritic growth of aluminum-magnesium alloy single crystals. Unidirectional melting and solidification processes of Al-Mg single crystals containing 0.5, 2.0 and 4.0 at%Mg were observed by real time x-ray topography, using 90 kW class high intensity rotating anode x-ray generator with TV-VTR imaging system. By this method, observations have been made on the following subjects: (1) sequential growth and morphologies of the dendrite arms during solidification as a function of growth rate. (2) morphological changes of dendrite arms as a function of Mg content. (3) morphological changes and solute redistribution during cooling and isothermal annealing after solidification. (4) observations of melting process of grown dendrite. The morphologies of the secondary and fourth arms varied with the change of growth rate. In the region of fast growth rate, primary and secondary arms have crossed at right angle, but they crossed at an acute angle in the region of slower rate. At the same growth rate of 150 μm/s, the angle between the primary and secondary arms became different due to Mg content,i.e. 90° in Al-4.0 at%Mg alloy and 69°in Al-0.5 at%Mg alloy, respectively. It was observed that a morphological change of dendrite arms during isothermal annealing occurs near the melting point in the first few minutes. Preferential growth directions of arms are not affected in dendrite growth by macroscopical growth direction. It should be noted that the solidification and melting processes are not exactly reversed.

07.2-1 EPITAXIAL GROWTH OF LEAD TIN SELENIDE FILMS ON (III) CALCIUM FLUORIDE AND ITS CHARACTERIZATION.

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Lead Tin Selenides are narrow energy gap semiconductors and so have potential uses for infrared applications. The epitaxial growth of them on alkalihalide and fluoride substrates has been accomplished by some methods(I)D.K. Hohnke and S.W.Kaiser,J.Appl.Phys.,I974,45,892-897. 2)M.Suzuki and T.Seki,Memoirs.Tohoku.Inst. Tech.,I985,Ser.I,I-7 etc.).
In this study, the epitaxial (III)films of $Pb_{I-x}Sn_xSe$ (x=0.06) were particularly grown on the polished and chemically etched (III) faces of CaF_2 substrates by molecular beam epitaxy method(MBE). We studied the influence of the growth conditions on the crystalline qualities and electrical properties of films.
The MBE growth system and procedure used here were similar to those described in ref.(2). The substrates were polished and chemically etched with diluted HF solution for 5-20 min. Prior to deposition, they were preheated at 500°C for 30 min. in a vacuum of $I0^{-6}$Pa. The binary compounds PbSe and SnSe were deposited simultaneously from each pyrolytic BN Knudsen cell. The temperature of each cell was controlled in order to obtain the selected PbSe/SnSe flux ratio. The growth temperature was in the range of 400-485°C and the growth rate was about 2 μm/h.
Crystalline qualities of films were evaluated with electron diffraction(ED), x-ray diffraction(XD) and scanning electron microscopy(SEM). Electrical properties were also investigated.