the film transparency oscillates as a function of the thickness at helium temperatures, and the plot has five transparency maxima. It can be assumed that the obtained nonmonotonic variation of the transparency with thickness is the consequence of quantization. If we estimate the number of levels that should fit in the thickness interval from 10^{-5} to 2×10^{-6} cm, we find their number to be $d_1/d_2 \approx 5$.

The value of the carrier effective mass can be estimated by using the potential-well model. Such an estimate yields $m^* = (0.1 - 0.3)\, m_0$. Since this estimate is very approximate, the obtained values of m^* can be regarded as satisfactory, especially in view of the possible influence of the light carriers on the observed effect. If the nonmonotonic change of the transparency obtained by us is indeed the consequence of quantization, then the decrease in the observed oscillations with increasing temperature must be assumed to result from the level spreading due to the decrease in the electron mean free path. The appearance of the effect of quantization in aluminum is quite probable, first because it is known that aluminum forms a good optical surface capable of producing specular reflection of the electrons, and further because the spin-orbit interaction, which is capable of smearing out the quantization effect, is quite small in aluminum.

It should be noted that a quantization effect was observed in the measurement of resistance of bismuth films [4].

The reported results are preliminary and naturally require further research.

In conclusion, it is our pleasant duty to thank Academician P. L. Kapitza for interest in the work and to V. Z. Kresin for a discussion of the results.

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* As was kindly reported to us by A. V. Ioganson, the question of the influence of quantization on optical characteristics was considered theoretically in [2].

** The film thickness was determined from the difference in the weights of the evaporator, and therefore the cited values may be slightly overvalued.

DEFECT STRUCTURE OF TRIGLYCINE SULFATE CRYSTALS IN THE FERROELECTRIC AND PARAELECTRIC STATES

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It was shown earlier that charged particles of platinum are selectively precipitated from a colloidal solution on active surface centers of triglycine sulfate (TGS) crystals, and reveal a domain structure at the same time. In the case of thermal evaporation, nucleation on the active centers of substrate crystals is also selective [1,2]. In the present investigation we have decorated the TGS structure by thermal evaporation of silver. The annealed TGS crystals were cleaved in vacuum ($\sim 5 \times 10^{-5}$ mm Hg) and silver was evaporated

on the (010) cleaved surfaces, followed by carbon. The TGS crystals were then dissolved and the carbon films with the silver particles were examined in a Hitachi-11 electron microscope.

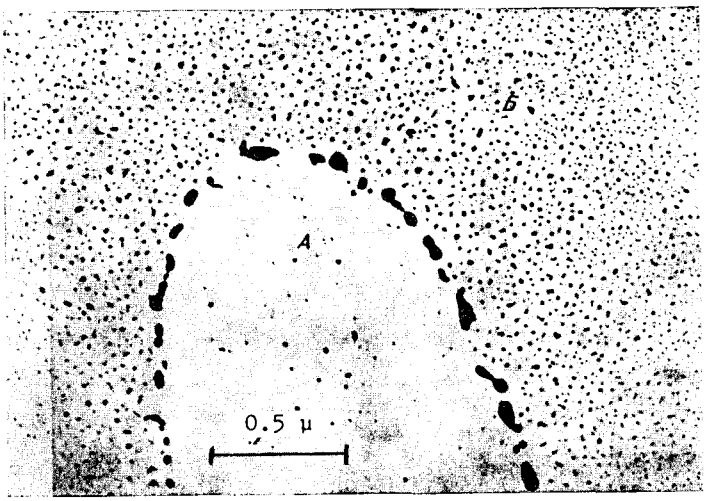

Fig. 1. Crystal temperature 20°C (ferroelectric state)

The decoration picture (Fig. 1) obtained on the TGS surface at room temperature shows clearly a lenslike domain A due to the selective crystallization of the silver in the neighboring domain B, which has an opposite sign. The average density of the decorating silver particles crystallizing on the active surface spots (active centers) is $\sim 2 \times 10^{11}$ cm^{-2}. The high density of the latter denotes that the silver nucleation occurs on point defects, and not on the points of dislocation emergence. The fact that the domain boundary was decorated by larger silver particles points to the larger activity of the boundary itself.

Fig. 2. Crystal temperature 65°C (paraelectric state)

Condensation of the silver on the surface of TGS heated above 49°C (Curie point), i.e., in the paraelectric state, leads to decoration pictures which correspond, as before, to the domain structure of the TGS. The surface of a TGS crystal kept for an hour at 65°C

and decorated at the same temperature, again showed a "domain" structure with very distinct domain boundaries (Fig. 2). The "domain" structure with very distinct domain boundaries (Fig. 2). The "domain" structure of the TGS surface is retained for a rather long time after the crystals are heated in the interval 50 - 90°C.

The disclosure of a "domain" structure in TGS crystals above the Curie point is a new and very important experimental fact showing that a definite defect structure of TGS crystals, which correlates in the ferroelectric state with the domain structure, is preserved also in the paraelectric state. This proves also that the selective nucleation of silver on domains charged to the same polarity is produced not under the influence of the electric field of the domains as a whole, but exclusively of the local active centers, which constitute accumulations of point defects that are polar and are oriented in the electric field of the domains. The orientation of the active centers above the Curie point is a highly unbalanced state. Further heating of the TGS crystals to 100°C for one hour leads to a uniform nucleation of the silver, due to disorientation of the active centers relative to the polar axis of the crystals. The uniform distribution of the active centers remains also after cooling the crystals to room temperature, whereas etching reveals the new domain structure immediately after going through the Curie point, i.e., the defect and domain structures do not coincide in annealed TGS crystals. Such a state is metastable, since the "aging" of the crystals leads both to a change (coarsening) of the domain structure and to an increase in the new distribution of the active centers. The domain and defect structures in the ferroelectric state interact with each other tending to become equal. The interaction has a mutual character: the electric polarization of the domains causes a corresponding orientation of the active centers, and the distribution of the active centers, which depends on the prior history of the samples, governs and determines the appearance of the particular domain structure. The observed defect structure, which consists of accumulations of point defects, apparently constitutes the "memory" of the TGS crystal domains, and presumedly of ferroelectric crystals in general.

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EFFECT OF EXTERNAL ELECTRIC FIELD ON THE ELECTRON RESONANCE SPECTRUM IN A MAGNETICALLY ORDERED PIEZOELECTRIC CRYSTAL

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The presence of the magnetoelectric effect in magnetically ordered crystals [1] gives grounds for assuming that a change in the electron-resonance spectrum can occur in these crystals when an external electric field is superimposed.

We investigated the influence of an electric field on the electron resonance in $Ga_{0.85}Fe_{1.15}O_3$ (T_c = 308°K) and observed a clear-cut effect consisting in a change of the