

stated high-pressure chamber with two parallel flat windows whose construction is described in [13]. The absorption edge was measured in monochromatic light transmitted through the SbSI crystal. The spectra were recorded with the aid of an FEU-38 electron photomultiplier. A UM-2 was used as the source of monochromatic light. At atmospheric pressure and room temperature the absorption edge of the investigated crystals was close to 630 m $\mu$ .

Figure 1 presents six curves of the temperature dependence of the absorption edge of SbSI in a field of 2 kV/cm which correspond to six different pressures in the range of 1 to 2000 atm and to Curie temperatures from 25 to  $-57^{\circ}\text{C}$ . As is seen from Fig. 1, the maximum shift of the absorption edge is observed at atmospheric pressure at the Curie point ( $T_C = 25^{\circ}\text{C}$ ). The magnitude of this shift  $\Delta E_g^E \approx 0.013 \pm 0.001$  eV is in good agreement with data in the literature. With increasing pressure one observes a decrease of this effect and for  $P = 1400$  atm its value at the maximum amounts to 0.003 eV. At the same time, a washing out of the temperature maximum of the effect takes place with increasing pressure. In the region of pressures greater than 1400 atm the magnitude and nature of the temperature dependence of the effect do not change. Separate measurements have shown that everywhere in the ferroelectric region the dependence of  $\Delta E_g^E$  on the field  $E$  is linear, whereas in the paraelectric region it is quadratic. The character of the field dependences of the effect is also the same in the range of pressures  $P > 1400$  atm.

With the aid of data presented in Fig. 1 we plotted the dependence of  $\ln(1/\Delta E_g^E)$  on  $\ln(T - T_0)$  for the para- and ferroelectric regions of the crystal. As follows from Fig. 2, where these dependences are presented for the paraelectric region, they turned out to be straight lines; as was to be expected, at atmospheric pressure the straight line is inclined at  $45^{\circ}$  to the abscissa. On approaching the triple point this angle decreases and close to it amounts to  $\sim 20^{\circ}$ . Further increase of the pressure does not change it noticeably. An analogous result is also obtained in the ferroelectric region. Let us add that at temperatures sufficiently different from the Curie point we observed an inversion of the sign of the effect which was due to the fact that

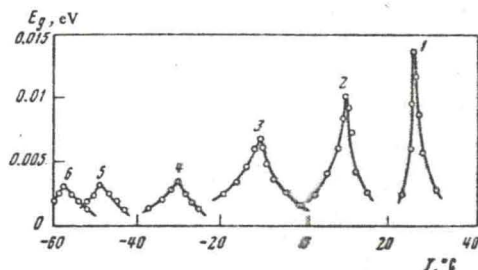


FIG. 1. The shift of the absorption edge of single-crystal SbSI in a field of 2 kV/cm as a function of the temperature for various hydrostatic pressures  $P$  in atm: 1 - 1, 2 - 400, 3 - 900, 4 - 1400, 5 - 1800, 6 - 2000.

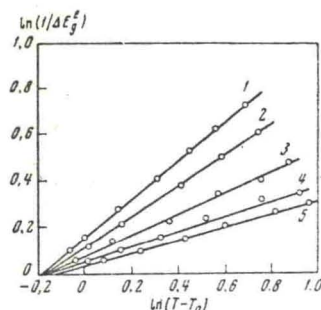


FIG. 2. The dependence of  $\ln(1/\Delta E_g^E)$  on  $\ln(T - T_0)$  for single crystals of SbSI in the paraelectric region for various values of the hydrostatic pressure (atm): 1 - 1, 2 - 400, 3 - 900, 4 - 1400, 5 - 1800, 6 - 2000.

then the magnitude of the Kern-Harbeke effect turned out to be comparable with the magnitude of the Franz-Keldysh effect.

Thus, an investigation of the Kern-Harbeke effect in SbSI in the pressure range of 1-2000 atm confirms, on the one hand, qualitatively the assumption made above about the temperature dependence of the effect, and is, on the other hand, an additional indication of the existence in SbSI of a critical point with the coordinates  $T = -40^{\circ}\text{C}$  and  $P = 1500$  atm.

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