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#### MELTING CURVES OF BISMUTH TELLURIDE ( $\text{Bi}_2\text{Te}_3$ ) AND ANTIMONY TELLURIDE ( $\text{Sb}_2\text{Te}_3$ ) AT HIGH PRESSURES

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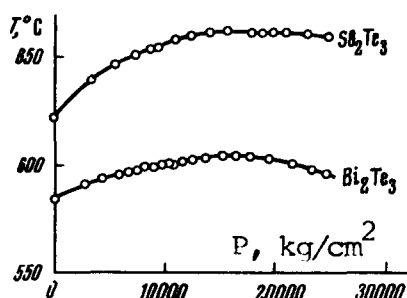
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The tellurides of antimony and bismuth are semiconductors with layer structure of the tetradimite type. The relative "friability" of this structure suggests that at high pressures these substances can go over into denser structures. In view of the small width of the forbidden band of  $\text{Bi}_2\text{Te}_3$  and its further decrease under pressure, it can be assumed that the expected phase transition of  $\text{Bi}_2\text{Te}_3$ , and possibly also that of  $\text{Sb}_2\text{Te}_3$ , is also a transition into the metallic state.

At present there is already some experimental evidence that  $\text{Bi}_2\text{Te}_3$  becomes metallic under pressure<sup>[2]</sup>, but the details of this transition remain unclear. We have investigated, by the thermal analysis method, the phase diagrams of  $\text{Bi}_2\text{Te}_3$  and  $\text{Sb}_2\text{Te}_3$  under hydrostatic pressures up to 25000  $\text{kg/cm}^2$ . The temperature and pressure were measured accurate to  $\pm 0.5^\circ\text{C}$  and  $\pm 75 \text{ kg/cm}$ , respectively.

The experimental results are shown in the figure. As can be seen from the figure, the melting curves of  $\text{Bi}_2\text{Te}_3$  and  $\text{Sb}_2\text{Te}_3$  have maxima at  $603.3^\circ\text{C}$  and 16000  $\text{kg/cm}^2$  for the  $\text{Bi}_2\text{Te}_3$ <sup>1)</sup> and  $662.0^\circ\text{C}$  and 16500  $\text{kg/cm}^2$  for  $\text{Sb}_2\text{Te}_3$ . In addition to the maxima, both curves exhibit kinks which obviously represent ternary points corresponding to the crossing of the melting curves and the lines of phase transition into the solid state. However, the phase transitions themselves were not registered, probably because the heats of the trans-

itions were too low.



Melting curves of  $\text{Bi}_2\text{Te}_3$  and  $\text{Sb}_2\text{Te}_3$  up to 25000  $\text{kg}/\text{cm}^2$

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- 1) The melting curve of  $\text{Bi}_2\text{Te}_3$  was also investigated by D. L. Ball<sup>[3]</sup> up to 50 kbar pressure, but under quasi-hydrostatic conditions. On the whole, Ball's data agree with ours.

#### MASER WITH TWO SERIES RESONATORS AND A "MOLECULAR RINGING" AMPLIFIER

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A maser was investigated with two cascaded cavities and with two colliding beams, one cavity acting as generator and the other as amplifier. A schematic diagram is shown in Fig. 1. We investigated the possibility of obtaining in this system a narrower spectral emission line than in a single-cavity maser.