Technological condition for synthesis and doping of chalcogenide semiconducting materials.

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A production of clean materials which containe the chalcogenides is concerned with the negative influence of the oxidized coatings of the initial elements and with the presence of a great vapour pressure above the melt which leads to an ampule explosion. We have developed some tehnological condition which can eliminate these drawbacks during the process of alloy production with the arsenic sulfides and selenides and gallium sulfides content. For the sake of explosion elimination during the synthesis we have used a two – section furnace. Move of the ampule into the section with the high temperature resulted in the producing of high – temperature compounds GaS and Ga_2S_3. In the section with low temperature the pressure of the sulfur vaporous was small and it eliminated the ampule explosion.

For the sake of influence diminishing of initial elements oxides we have used the vacuum distillation, guided crystallization and calcination of the alloy in the hydrogen. The alloys, produced from the cleaned by this manner imtial materials, are characterized by the high photosensitivity at the fundamental absorption edge in comparison with the alloys, produced from the uncleaned materials.

Doping of alloys by small concentration of tin and lead was performed in a soldered quartz ampules assisted by active vibrations and mechanical shaking. We have obtained the homogeneous doping which resulted in the noticeable increase of the alloy photoconductivity. The obtained alloys, contained the arsenic selenides and sulfides, exhibite the photosensitivity of order of $6 \cdot 10^{-11}$ cm^2/v and holographic sensitivity about 250 m^2/J, which exceeds the analogues value for the industrial plates of Agaf and Gewart 10E70 ($8m^2/J$).