

Method for growing solid solution of $\text{Ag}_3\text{As}_{0.8}\text{Sb}_{0.2}\text{S}_3$ composition using method of directional crystallization from melt solution, which includes stepwise heating of vacuum-sealed quartz ampoules from previously synthesized ternary sulfides Ag_3AsS_3 and Ag_3SbS_3 taken in stoichiometric ratio, at a rate of 100 K/h up to a temperature of 810 K, and holding at this temperature for 72 hours to homogenize melt of obtained charge. Single crystals are then grown in vacuum-sealed quartz ampoules using method of directional crystallization from melt solution at a temperature of 810 K for 48 hours, then, annealing is performed at a temperature of 623 K for 420 hours. Single crystal growth rate is 0.1 mm/h, it is cooled to room temperature at a rate of 5 K/hour.