

Method for producing $\text{Pb}_{2-x}\text{Sn}_x\text{GeS}_{4-y}\text{Se}_y$ ($0 < x < 2$; $0 < y < 4$) Pb_2GeS_4 -based materials which exhibit structural transitions, includes the preparation of starting charge from high-purity elemental components in evacuated quartz containers. Appropriate amounts of tin and selenium are added to modify the cationic and anionic sublattices, with a heating rate of 35-40 °C/h up to 1020-1040 K; annealing time is 4-5 hours, cooling rate is 6-10 °C/hour to 720-740 K, and quenching is performed in water at room temperature without evacuating the vacuum.