

Invention relates to the field of materials science and to areas of instrumentation such as space technology, integrated microelectronics, and biomedical electronics, specifically to devices for generating electrical energy, and may find application in various industrial sectors requiring new and efficient energy sources. The method for producing superionic ceramics based on a nanocrystalline powder of a solid solution of $\text{Ag}_7\text{Si}_{0.4}\text{Ge}_{0.6}\text{S}_5\text{I}$ composition as a material for a solid-electrolyte energy source, involves the stepwise heating of evacuated quartz ampoules containing pre-synthesized ternary halochalcogenides $\text{Ag}_7\text{SiS}_5\text{I}$ and $\text{Ag}_7\text{GeS}_5\text{I}$ in a stoichiometric ratio. The heating is conducted at a rate of 100 K/h up to 1273 K, followed by holding at this temperature for 72 hours to homogenize the melt of the resulting charge. A solid solution of $\text{Ag}_7\text{Si}_{0.4}\text{Ge}_{0.6}\text{S}_5\text{I}$ composition is ground in a planetary ball mill into a powder with a particle size of 100 nm. Subsequently, the powder is pressed at a pressure of 400 MPa to produce discs with a diameter of 10 mm and a thickness of 2-3 mm. These discs are placed in evacuated quartz ampoules, heated at a rate of 20 K/h to a temperature of 973 K, and held at this temperature for 36 hours. Afterward, they are cooled to room temperature, and electrical contacts are applied to the end surfaces of the discs. The invention enables the production of superionic ceramics with high electrical conductivity and is characterized by greater manufacturability and cost-effectiveness.