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Materials of antisublimation coatings for semiconducting branches of thermoelements

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Material of antisublimation coatings for branches of thermo elements based on n-type PbTe from vitreous enamels SiO_2- $Bi2O_3$-PbO- Na_2O and technology of their obtaining and coating have been developed. Vitreous enamel, based on above-mentioned system gives possibilities to create antisublimation coatings in a short time by using cheap initial materials. Obtained coating is characterized by high level of protection against sublimation (fig.). High anti sublimation characteristics are maintained after long-lasting resource tests. High level of anti-sublimation protection of vitreous enamel is realized in the case of finding the working temperature of branches of thermo elements between td and tD points on the curves of thermal expansion of the vitreous enamels. This is achieved by changing its chemical composition. Similar results were received during investigation of vitreous enamel for antisublimation coatings for low and high temperature branches of thermo elements.

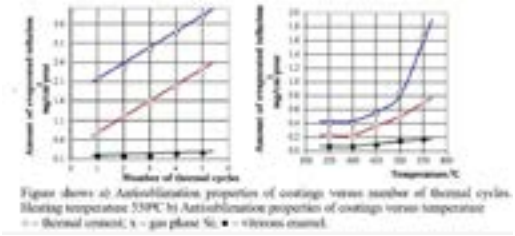

Figure shows a) Antisublimation properties of coatings versus number of thermal cycles. Heating temperature 550PC b) Antisublimation properties of coatings versus temperature - - thermal ceramic; x - gas phase Si; ● - vitreous enamel.

Biography

F Basaria has great experience in a field of development of materials composition and technological processes of preparing anti sublimation coating from inorganic vitreous enamels on the surface of thermoelements branches (p-GeTe, n-PbTe). In 1965-1967 in Sukhumi Institute of Physics and Technology (SIPT) antisublimation coatings based on vitreous enamels were developed by V Karzhavin and for creation of high performance thermoelectric battery of the two-cascade thermoelectric generator (TEG). His work is significant for creation reliable antisublimation protection on the low- (300°C) and high temperature (1100°C) branches of thermoelements.

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