МИНИСТЕРСТВО ВЫСШЕГО ОБРАЗОВАНИЯ, НАУКИ И ИННОВАЦИЙ РЕСПУБЛИКИ УЗБЕКИСТАН

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harakatchanligi R_x yuqori va holatlar zichligining effektiv massasi m* kichik bo‘lgan “yengil” kovaklar ishtirok etadi.

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EFFECT OF Bi- Sb(Se-Te) BASED CHALCOGENS

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Abstract: Bi-Se-Sb-Te solid alloy-based elements are considered as one of the promising thermoelectric materials working in the temperature range of 200-600 K to solve current environmental and energy problems.

Key words: thermoelectric material, inert gas, electrical conductivity, thermoelectric coefficient

Currently, alloys based on Bi-Sb-(Se,Te) are becoming one of the most promising thermoelectric materials for solving environmental and energy problems.

In order to increase the thermoelectric efficiency of thermoelectric materials obtained under inert gas pressure, it is necessary to correctly select the composition and operating parameters of materials based on Bi_2Te_3 and Bi_2Se_3. In order to purposefully change the parameters of the base material, we added chalcogens in

excess of stoichiometry to the powder. Depending on the change of the amount of chalcogen, taking the base with optimal values of thermoelectric coefficient α =200 ÷ 240 μV/K and specific electrical conductivity σ= 60 ÷ 200 $Ohm^{-1}\cdot cm^{-1}$, their thermoelectric properties were checked. Tellurium, selenium and sulfur were used as chalcogens added to the mixture in excess of stoichiometry.

Since thermoelectric materials work at high temperatures, it was determined that the average integral value of the material's efficiency index is $Z = 1.59\cdot10^{-3}$ $grad^{-1}$ in the temperature range of $20\div300^0$C from the temperature dependence of the thermoelectric parameter of the material.

The table below shows the electrophysical parameters of solid alloys with high thermoelectric properties in the Bi-Sb-Te-(Se) system.

№	chalcogens in excess of stoichiometry	$\propto, \frac{\mu V}{K}$	$\sigma, Om^{-1}sm^{-1}$	$\propto^2 \sigma, \frac{\mu V}{sm\cdot °C^2}$
1	Te	198	590	0,24 *mol.%*
2	Se	200	600	0,12 *mol.%*
3	S	194	580	0,08 *mol.%*

Since the alloy is not mixed in the melting process when making alloys under inert gas pressure, it is necessary to check the homogeneity of the distribution of thermoelectric properties along the length of the casting. The resulting cast has a cylindrical shape, its length is 9 cm and its diameter is 3.2 cm.

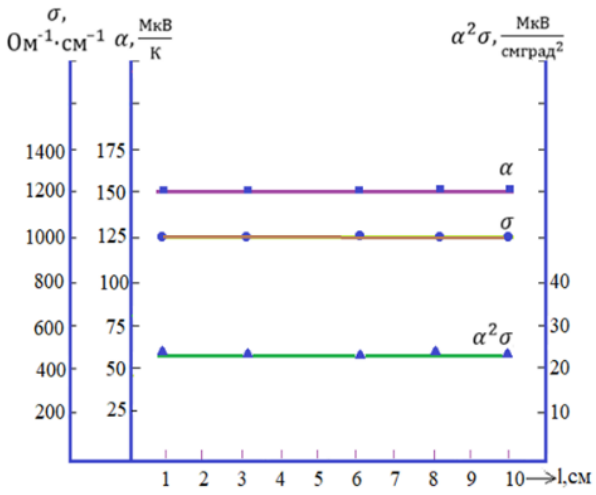

Figure 2. Variation of thermoelectric parameters along the length of Bi_2Te_3 and Bi_2Se_3 alloys.

The casting is divided into 10 equal parts along its length, and the results of measuring their thermoelectric properties are shown in Fig. 2. According to the results of the research, the casting is almost homogeneous along its length according to its thermoelectric properties.

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POLIKRISTALL YUPQA STRUKTURALARDA, ANOMAL FOTOMAGNIT KUCHLANISH MAVJUDLIGI O'RGANISH

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Annotatsiya: Olingan natijalar, vakuumli bug'lanish natijasida hosil bo'lgan uch selenli surma amorf yupqa pardalarida har doim yuqori nuqsonlar kontsentratsiyasi mavjudligini ta'kidlashga imkon beradi. Uch selenli surma plyonkalari va boshqa yarimo'tkazgichli, kristall bo'lmagan yupqa pardalarida tuzilmalarining xususiyatlarini o'rganish, keyinchalik organik yoki tirik moddalar kabi yanada murakkab materiallarning xususiyatlarini tushunishga urinishlar uchun kerak.

Kalit so'zlar: Polikristall, amorf, xalkogenid, anizotrop bug'latish, bir jinsli bo'lmagan, molekulyar oqim, radiatsion**.**

Polikristall materiallar yarimo'tkazgichlar fizika va texnikasi sohasida eng muhim istiqbolli yo'nalishlardan hisoblanadi. Bunday materiallar bir jinsli emas (BJE) geterogen strukturaga ega bo'lib, ularning mikrozarrachalari nostandart formaga ega bo'ladi. Mikro zarracha (MZ) chiziqli o'lchamlari 10^{-5} – 10^{-4}sm tartibida bo'ladi. Mikrozarrachalar orasida ularni bog'lovchi oraliq qatlamlar bo'lib, ularning xususiyati va stixiometriyasi material mikro zarrachasinikidan tubdan farq qiladi. Hattoki mikro zarracha va oraliq qatlam elektr o'tkazuvchanligi ham keskin farq qiladi. Shu sababli mikro zarracha va oraliq qatlam o'ziga xos har xil strukturalar kontaktini hosil qiladi. Oraliq qatlam yuqori qarshilikli soha deb, mikrozarracha qarshiligi undan kamroq qarshilikli deb hisoblanadi. Lekin ba'zi hollarda teskari holat