MAREA P2 **Bi-Sb LAYERS AND WIRES FOR MAGNETO- THERMOELECTRIC APPLICATIONS**

A.A. Nikolaeva[1,*], L.A. Konopko[1], P.P. Bodiul[1,2], I.A. Popov[1], E.F. Molosnik[1], G.M. Rastegaev[1]
[1]*D.Ghitu Institute of Electronic Engineering and Nanotechnologies, Chisinau, Moldova;*
[2]*Technical University, Chisinau, Moldova*
*E-mail: A.Nikolaeva@nano.asm.md

Thermoelectric energy conversion efficiency is defined as $ZT = S^2\sigma/\chi T$, where S is the Seebeck coefficient, σ is the electrical conductivity, χ is the thermal conductivity, and T is the absolute temperature.

This study is aimed at increasing the thermoelectric figure of merit ZT to maximize the power factor and minimize the thermal conductivity.

Since undoped Bi–12at%Sb alloys are of *n*-type, the possibility of obtaining *p*-type Bi–Sb alloys (bulk samples and layers) with a high figure of merit by the addition of acceptor impurities and the application of a transverse magnetic field has been explored.

The mechanical exfoliation method was used to obtain $Bi_{1-x}Sb_x$ layers and the liquid-phase casting method (Ulitovsky–Tailor) was used to prepare wires [1].

In this paper, we present the results of measurements of transport effects in undoped and doped Bi–12at%Sb–0.001at%Pb alloy bulk samples, single-crystal layers, and glass-insulated wires. The measurements included the electrical resistivity, Seebeck coefficient *S*, and the Nernst coefficient as a function of crystallographic direction, temperature, and magnetic field direction.

The values and temperature dependence of power factor $\alpha^2\sigma$, which were calculated from experimental data in a transverse magnetic field, showed a considerable increase in this parameter in the wires and layers compared with the bulk samples in a magnetic field of 0.3 T [2, 3]. A combination of the Peltier and magneto-Peltier effects in Bi–Sb layers and wires provides a stronger cooling both from room temperature and from 100 K than the cooling in bulk alloys of the same composition.

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