STRUCTURE AND ELECTRONIC PROPERTIES OF MODIFIED BISMUTH FILMS Ge$_2$Sb$_2$Te$_5$

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This article shows the study results of optical transmission spectra investigation and temperature dependencies of conductivity of virgin and modified by bismuth Ge$_2$Sb$_2$Te$_5$ thin films, obtained by the method ion-plasma sputtering. It has been estimated that electronic properties of bismuth modified films significantly changes. Particularly, reducing of the optical energy gap and activation energy are estimated. While the conductivity at the room temperature increases. Decreasing of the optical energy gap can be interpreted that bismuth doping forms the chemical bonds with elements of the ChG matrix and forms inside the film well known narrow gap semiconductors compounds Bi$_2$Te$_3$, etc. In this case Fermi energy is still fixed in the middle of energy gap, decreasing of the activation energy of conductivity and increasing the conductivity as a consequence of decreasing of the optical energy gap.

Keywords: flashmemory, structure, transmission electron microscopy, Raman spectroscopy, Ge$_2$Sb$_2$Te$_5$, modification, conductivity