

## The Impact of Technology on the Crystallographic Form Nanostructures PbTe: Sb on Ceramics

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Lead telluride (PbTe) is an advanced semiconductive material in manufacturing optoelectronics devices related to infrared spectrum area, as well as in termoelectronics of medium frequency temperature (500-850) K[1]. PbTe alloying with group 5 impurity heterovalent (Sb, Bi) of Periodical Table are cause modification of electronic and phononic crystal system. Vapor-phase nanostructures on glass ceramics lining have been received from vapor-phase procedure due to open evaporation in vacuum environment ahead of obtaining synthesized compound PbTe:Sb that contains 0.25 at% in different time  $\tau = (15-240)$  c and temperatures  $T_{II}=(420-520)$  K deposition, according to evaporation temperature  $T_B = 970$  K.

With the help of applied Gwyddion Program the AFM investigation are showed that it is possible to define hardness and size of nanocrystals but not only morphology of condensate surface. We defined polar and azimuth angles of either sides of certain PbTe:Sb glass ceramics nano crystals with clear sides, that helped to find angles between normals towards sides, and finally compare received data with theoretically possible ones. In addition, the results of AFM images of individual nanocrystals and the calculation of the corners first methods of computer simulation using the original Phoenix program written in Visual Basic restored their ideal image. At hasbun shown that the increase of settling time  $\tau$  twice applying constant temperature of the substrate, maximum height of nanocrystals would coust the increases twice as well. We defined that certain PbTe:Sb glass ceramics nanocrystals of vapor-phase condensates have been formed by cube system area  $\{100\}$  as well as orthorhombic dodecahedron area  $\{110\}$ , which are electrically neutral and possess the largest reticular atom density.

Having applied computer modeling approaches we have managed to restore in PbTe:Sb glass ceramics condensate the crystal forms that are correspond to different combinations of NaCl area structure. Thus, the establishment features crystalline forms nanocrystals PbTe: Sb explained electrically neutral state crystallographic planes and the nature of the substrate surface ceramics.

1. Dmitriev L.V. Modern trends in the physics of thermoelectric materials. // The success of physical science. –2010. – V. **180**, №8. – P .821