



S1-1.11

Structural Characterization of Some As-S-Sb-Te Nanostructured Materials

O.V. Iaseniuc and M.S. Iovu

Institute of Applied Physics, Str. Academiei 5, MD-2028 Chisinau, Republic of Moldova

Nanostructured As-S-Sb-Te semiconductors were synthesized and characterized by X-ray fluorescence analyzer (XRF), X-ray diffraction, and optical absorption methods. The X-ray diffraction patterns of investigated powders show the presence of amorphous and nanocrystalline phases with the structural units As_2S_3 , Sb_2S_3 and Sb_2Te_3 . The transmission spectra in the region of wavenumbers $\nu=1000\div 6000\text{ cm}^{-1}$ show a high transparency just with a single weak absorption band at $\nu=2340\text{ cm}^{-1}$ caused of the presence H_2S impurity. For the alloys of $(\text{As}_2\text{S}_3)_x(\text{Sb}_2\text{S}_3)_{1-x}$ system, with increasing of the Sb_2S_3 trigonal structural units in the above mentioned system, the absorption edge is shifted toward lower photon energy, that corresponds to the optical band gap about $E_{g.}=2.34\text{ eV}$ for As_2S_3 , 2.1 eV for $(\text{As}_2\text{S}_3)_{0.65}(\text{Sb}_2\text{S}_3)_{0.35}$, 1.92 eV for $(\text{As}_2\text{S}_3)_{0.35}(\text{Sb}_2\text{S}_3)_{0.65}$ and 1.73 eV for Sb_2S_3 .