MICROSTRUCTURE OF THIN Si–Sn COMPOSITE FILMS

V.B. Neimash[1], *V.M. Poroshin*[1],
A.M. Kabaldin[1], *V.O. Yukhymchuk*[2], *P.E. Shepelyavyi*[2],
V.A. Makara[3], *S.Yu. Larkin*[4]

[1]Institute of Physics, Nat. Acad. of Sci. of Ukraine
(*46, Nauky Ave., Kyiv 03680, Ukraine;*
e-mail: neimash@gmail.com),
[2]V.E. Lashkaryov Institute of Semiconductor Physics,
Nat. Acad. of Sci. of Ukraine
(*45, Nauky Ave., Kyiv 03028, Ukraine*),
[3]Taras Shevchenko National University of Kyiv,
Faculty of Physics
(*2, Academician Glushkov Ave., Kyiv 03127, Ukraine*),
[4]Public Joint Stock Company
"Research and Production Concern Nauka"
(*2b, Les' Kurbas Ave., Kyiv 03148, Ukraine*)

S u m m a r y

Microstructure investigations of thin Si-Sn alloy films were carried out, by using Auger and Raman spectroscopies, X-ray fluorescence analysis, and electron microscopy. The films were produced by the thermal-vacuum coevaporation of Si and Sn. The properties of films with the Sn content ranging from 1 to 5 wt.% are studied. A significant influence of the tin impurity on the formation of a film surface microrelief and nanocrystals in the amorphous matrix is found. The size of quasispherical formations on the film surface can be of the order of 100 nm. The volume fraction of the silicon nanocrystalline phase in a film can reach 90%. The roles of fabrication conditions and growth rate on the distributions of Sn and technological impurities C and O over the film surface and across the film thickness are analyzed.