INVESTIGATION OF PHOTOLUMINESCENCE AND ELECTROCONDUCTIVITY OF ZnTe GROWN IN HYDROGEN ATMOSPHERE

D.V. Korbutyak, N.D. Vakhnyak, D.I. Tsutsura[1], *O.M. Pihur*[1], *R.M. Peleshchak*[1]

Lashkarev Institute of Semiconductor Physics,
Nat. Acad. Sci. of Ukraine
(*41, Nauky Prosp., Kyiv 03028, Ukraine*),
[1]Ivan Franko Drogobych State Pedagogical University
(*24, Ivan Franko Str., Drogobych 82100;*
e-mail: olia-ifm@yandex.ru)

S u m m a r y

We have investigated the low-temperature photoluminescence (PL) and the temperature dependence of the electroconductivity for ZnTe monocrystals grown in hydrogen atmosphere at various pressures. The increase in the hydrogen pressure in the range 0.4—3.0 Torr results in a rise of the intensity of exciton PL lines in the crystals grown at a pressure of 0.6 Torr; afterwards, one observes a tendency to its reduction, which is associated with the hydrogen passivation of fine acceptor centers in the given crystals. In ZnTe samples containing oxygen, there appear a wide radiation band in the energy range 1.7—2.0 eV and a narrow line with the radiation maximum located at 2.030 eV. It is supposed that these lines are associated with the radiation of a O_{Te}-A complex formed due to the substitution of tellurium with oxygen. An isovalent O_{Te} impurity results in the compressive deformation and the strong electron-phonon interaction, which forms a complicated radiation spectrum with the participation of LO (25.3 meV), LA (14.5 meV), and TA (7.4 meV) phonons.