NEW $CdLa_2(WO_4)_4:Nd^{3+}$ SINGLE CRYSTAL FOR LASERS: GROWTH AND PROPERTIES

V.N. Baumer[1], Yu.N. Gorobets[1], M.V. Doroshenko[2], M.V. Dobrotvorskaya[1], M.B. Kosmyna[1], P.V. Mateychenko[1], B.P. Nazarenko[1], V.M. Puzikov[1], A.N. Shekhovtsov[1]

[1] Institute for Single Crystals, NAS of Ukraine, Kharkov, Ukraine
[2] A.M.Prokhorov General Physics Institute, RAS, Moscow, Russia
E-mail: shekhov@isc.kharkov.ua

Tungstate crystals are widely used for different applications: lasers, X-ray detectors, tomography, etc. To expand a number of functional crystal matrix the $CdLa_2(WO_4)_4$ single crystals have been grown, their crystal structure and properties have been studied in first.

The differential thermal analysis and X-ray structure analysis were used to investigate the peculiarities of solid state synthesis of $CdLa_2(WO_4)_4$. The main crystallographic parameters of $CdLa_2(WO_4)_4$ were unscramble. The $CdLa_2(WO_4)_4$ single crystals were grown for the first time by using the Czochralski method. But there were essential problems during the crystal growth process. It was established, a volume defect - the opaque Cd enriched layer on crystal surface (thickness up to 1mm) has appeared. The $CdLa_2(WO_4)_4$ crystals possess strong intrinsic strains. Nevertheless, the $CdLa_2(WO_4)_4:Nd^{3+}$ single crystals free of impurity phase and macroscale defects were grown.

The absorption, luminescence spectra, and luminescence decay of $CdLa_2(WO_4)_4:Nd^{3+}$ single crystals were measured and the possibility of laser application was discussed.