

Optical and structural characteristics cubic boron nitride with ions Nd

S.V. Leonchik¹, A.V. Karotki¹

¹ SSPA "Scientific-Practical Materials Research Centre of NAS of Belarus", Minsk, Belarus

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The synthesis of cubic boron nitride cBN:Nd micropowder with neodymium has been performed under high temperature (1800 – 2000 K) and high pressure (3.5 – 4.0 GPa), using a charge of hexagonal boron nitride hBN, Li₃N as solvents and NdF₃ micropowder. Lattice parameters of cBN:Nd micropowder and standart micropowder cBN (synthesized without NdF₃ compound) were determined by X-ray diffraction method to be about of ~ 3.615 Å for both type of micropowders. The chemical composition of the cBN:Nd micropowder was detected using an energy dispersive X-ray spectral microanalysis. It is found that the surface of cBN:Nd grains contain microinclusions and thin films formation of Nd compounds. The luminescence spectra demonstrated the presence of Nd³⁺ ions in cBN:Nd micropowder. The Nd³⁺ emission in the spectral region of 1.2 – 1.1 eV and 1.50 – 1.35 eV attributed to $^4F_{3/2} \rightarrow ^4I_{11/2}$ и $^4F_{3/2} \rightarrow ^4I_{9/2}$ optical transitions respectively.