THERMOLUMINESCENCE IN DOPED SINGLE CRYSTALS $Li_2B_4O_7$:A (A = Cu, Ag)

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S u m m a r y

On the basis of the results of studies of the thermoluminescence (TL) and absorption spectra of $Li_2B_4O_7$:Cu and $Li_2B_4O_7$:Ag single crystals, we propose a mechanism of formation of A^0-centers of TL with the participation of growth defects of the type of "strange" boron-oxygen complexes. A^0-centers play a dominant part in the accumulation of the light yield under radiation. The TL radiation is realized by means of the energy transfer to a self-trapped electron in the $Li_2B_4O_7$, crystal lattice followed by its radiative annihilation. It is established that the absorption spectra of Cu^+ ions in $Li_2B_4O_7$ single crystals are formed by the parity-forbidden $3d^{10} \rightarrow 3d^9 4s$ electron transitions between the levels split by the crystal field, while, in the case of Ag^+ ions, by the allowed $4d^{10} \rightarrow 4d^9 5p$ transitions. It is concluded that the presence of Cu and Ag impurities promotes an increase of the TL efficiency for $Li_2B_4O_7$ single crystals due to the accumulation of a higher light yield and/or a decrease of the number of nonradiative acts of annihilation of self-trapped excitons.