04,08,09

Radiation-Stimulated Transformations $Yb^{3+} \rightarrow Yb^{2+}$ and $Yb^{3+} \rightarrow Yb^{3+}$ in Single Crystals and Nanoceramics $CaF_2 : YbF_3$

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Received May 13, 2022
Revised May 13, 2022
Accepted May 23, 2022

The radiation resistance of $CaF_2 : YbF_3$ (3 mol.% YbF_3) laser ceramics and a single crystal of similar composition (3.6 mol.% YbF_3) exposed to gamma rays in a ^{60}Co source is studied. The non-irradiated samples have been shown to be similar in spectral characteristics. After the $CaF_2 : YbF_3$ crystals and ceramics γ-irradiation and the following time exposure, along with transformations $Yb^{3+} \rightarrow Yb^{2+}$, configurational $Yb^{3+} \rightarrow Yb^{3+}$ transitions between different states of Yb^{3+} ions in the structure of samples are carried out, with the participation of interstitial F_i ions.

Keywords: radiation resistance, laser ceramics, gamma rays, spectral characteristics defects.