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From $\text{Sm}^{3+}:\text{La}_2\text{O}_3\text{-ZnO-Na}_2\text{O-TeO}_2$ glasses to transparent glass ceramics containing ZnTeO_3 and $\text{La}_2\text{Te}_4\text{O}_{11}$ nanocrystals - influence of the heat treatment on crystal growth and fluorescence properties

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treatment on crystal growth and fluorescence properties**

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Abstract

The letter paper presents the synthesis and spectroscopic properties of Sm^{3+} -doped transparent TeO_2 -based glass ceramics containing ZnTeO_3 and $\text{La}_2\text{Te}_4\text{O}_{11}$ nanocrystals. The impact of heat treatment is presented and discussed. X-ray diffraction and transmission electron microscope results demonstrate that nanocrystals are precipitated homogeneously among the glass matrix. Excitation in the $^6\text{P}_{3/2}$ bands of Sm^{3+} produces a strong orange and red emission from the $^4\text{G}_{5/2}$ level. The results show noticeable differences between glass precursor, bulk and nanocrystalline $\text{Sm}^{3+}:\text{La}_2\text{Te}_4\text{O}_{11}$ in luminescence experimental data.

Keywords: Ceramics; Crystal growth; Nanocrystalline materials; Luminescence; Optical materials and properties.

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