

OPTICAL TRANSITIONS OF Er³⁺ DOPED TELLURITE GLASSES

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ABSTRACT

Er³⁺ doped tellurite glasses of molar composition (80-x)TeO₂-18ZnO-1MgO-1Li₂O-(x)Er₂O₃ system (0.5mol%≤x≤2.5mol%) have successfully been made by melt quenching technique. The absorption spectra were measured and the Judd-Ofelt analysis was performed. It is found that the spectrum of UV-Vis-NIR spectroscopy is consists of absorption peaks around 1530nm, 974nm, 798nm, 652nm, 544nm, 522nm, 488nm, 452nm, 444nm, and 406nm, and are correspond to the transitions from ground state $I_{15/2}^4$ to the excited state of $I_{13/2}^4$, $I_{11/2}^4$, $I_{9/2}^4$, $F_{9/2}^4$, $S_{3/2}^2$, $H_{11/2}^4$, $F_{7/2}^4$, $F_{5/2}^4$, $F_{3/2}^4$, and $H_{9/2}^2$ respectively. The Judd-Ofelt parameters Ω_2 , Ω_4 , Ω_6 have been used to correlate between the composition and the change of structure of the host glass. It is found that the Er³⁺ content exhibits some influences on the spectroscopic properties of the optical transition for Er³⁺ ions.

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