

Spectroscopic studies of Er³⁺-Yb³⁺ codoped multicomposition tellurite oxide glass

ABSTRACT

Multicomposition of Er³⁺-Yb³⁺ codoped tellurite oxide, TeO₂-ZnO-PbO-TiO₂-Na₂O glass has been investigated. Detailed spectroscopic study of the Judd-Ofelt analysis has been performed from the measured absorption spectrum in order to obtain the intensity parameters Ω_t ($t=2, 4, 6$). The calculated Ω_t values were then utilized in the determination of transition probabilities, radiative lifetimes and branching ratios of the Er³⁺ transitions between the $J(\text{upper})$ - $J(\text{lower})$ manifolds. Both visible upconversion and near-infrared spectra were characterized under the 980 nm laser diode excitation at room temperature.

Keyword: Judd-Ofelt analysis; Tellurite oxide glass; Upconversion