Spectroscopic studies of Er$^{3+}$-Yb$^{3+}$ codoped multicomposition tellurite oxide glass

ABSTRACT

Multicomposition of Er$^{3+}$-Yb$^{3+}$ codoped tellurite oxide, TeO$_2$-ZnO-PbO-TiO$_2$-Na$_2$O 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 $\Omega_t$ ($t=2$, 4, 6). The calculated $\Omega_t$ values were then utilized in the determination of transition probabilities, radiative lifetimes and branching ratios of the Er$^{3+}$ transitions between the $J$(upper)-$J$(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