

Abstract Submitted  
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**Stimulated emission cross section and chromaticity study of Sm-doped bismuth telluro-borate glasses** SUMAN RIJAL, SAISUDHA MALLUR, PANAKKATTU BABU, Western Illinois University — Glass doped with rare earth (RE) ions are important materials for optical devices. We prepared a series of bismuth borate glasses with the composition  $x\text{Bi}_2\text{O}_3:(99.5 - x) \text{B}_2\text{O}_3$  ( $x = 29.5$  to  $59.5$  mol%) doped with  $0.5$  mol%  $\text{Sm}_2\text{O}_3$  and studied the optical absorption and fluorescence spectra. Judd – Ofelt (JO) theory is used to study the optical absorption and to calculate the radiative transition probabilities. We used area of the spectrum to calculate the oscillator strength. The set of the intensity parameters  $\Omega_t$  ( $t=2,4,6$ ) is obtained from the experimental oscillator strengths and the calculated oscillator strength.  $\Omega_2$  parameter which depends on the asymmetry of the ligand field at the RE site and RE-O covalency is found to be maximum for the glass sample having  $39.5$  mol%  $\text{Bi}_2\text{O}_3$ . We calculated the stimulated emission cross-sections of the intense fluorescence lines of  $\text{Sm}^{3+}$  ions. We used three glass samples with  $\text{TeO}_2$  to study the chromaticity. The color coordinates corresponding to the prominent emissions of the glass samples were determined by using the CIE color matching function calculator. The color emissions were analyzed using the CIE color coordinate diagram. We got white color for all the samples except  $30\text{Bi}_2\text{O}_3:20\text{TeO}_2: 59 \text{B}_2\text{O}_3:0.5\text{Sm}_2\text{O}_3 :0.5\text{Eu}_2\text{O}_3$  which gave yellow.

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