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Effect of Ag Particles on the Fluorescence Properties of Eu Ions in Lead Borate Glasses PRAKASH GIRI, MAHENDRA DC, SAISUDHA MALLUR, P.K. BABU, Western Illinois University — We have investigated the effect of Ag particles on the fluorescence of trivalent Eu ions in lead borate glasses. Lead borate glasses were prepared with varying Ag content (0 to 3 mol%) and sizes of Ag particles were controlled by varying the duration of annealing near the glass transition temperature. Fluorescence spectra of all these samples were obtained at two different excitation wavelengths (395 nm and 464 nm). Glass samples with Ag particles show an increase in the intensities for the major peaks in the Eu fluorescence spectra, appearing near 589 nm and 613 nm. Detailed analysis show that the enhancement effects clearly depend on the duration of annealing and the concentration of Ag. Fluorescence intensity enhancement is readily observed at relatively shorter annealing time (5 h) for samples with higher Ag concentration whereas a much longer annealing time (25 h) is required to observe any significant enhancement in fluorescence intensity for lower concentration of Ag. For higher concentrations of Ag, a broad feature is seen around 450 nm due to the emission from Ag particles and the effect of Ag is more pronounced for the fluorescence peak at 589 nm.

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