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Synthesis and properties of solution-processed Eu^{3+} : BaY_2F_8.

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The structural and optical properties of solution-processed Eu3+:BaY2F8 were characterized and compared to those of the sample synthesized by a solid-state reaction method. Precipitated from solution Eu3+:BaY2F8 has the fluorite (CaF2) type of structure, which transforms completely into monoclinic form when powder is heated at 750 °C. This temperature is also sufficient for entire elimination of hydroxyl groups. The intensities of f–f emission transitions of Eu3+ in BaY2F8 were analyzed in the frame of Judd–Ofelt model and the values of 1.23×10−20 and 1.95×10−20 cm2 were determined for Ω2 and Ω4 intensity parameters. The experimental lifetimes of the 5D0 and 5D1 levels are equal to 8.4 and 2.3 ms, respectively. The quantum efficiency of Eu3+ in BaY2F8 was evaluated to be ∼35%.

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