Morphology of Flux Grown Blue Emitting BAM Phosphors for PDP Applications

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The $BaMgAl_{10}O_{17}:Eu^{2+}$ (BAM) phosphor is being used as a blue component in plasma display panels (PDP's) due to its color purity as well as its high luminescence efficiency. When compared to other two components (Green and red), the degradation of BAM phosphor is high. To improve the life of the phosphor in a display, various material preparations have been proposed. Of all, the phosphor prepared by solid sate reaction yields better performance. From the literature and from our own experience, we found that the morphology (shape and size) also contributes to degradation process. To understand and minimize the degradation, we prepared a number of BAM samples by solid-state reaction with various flux materials viz., alkali halides along with halides of ammonium and /or aluminum[1]. Trace amounts of these fluxes effects the size and shape of the phosphor particles. Degradation in brightness of these phosphor materials are studied by exposing powder samples to high energy Xe flush lamp. In this presentation, the morphology including size and shape of BAM phosphor particles prepared in presence of various flux materials and the role of morphology in display performance is described and discussed.

[1] S. Oshio, T. Matsuoka, S. Tanaka and H. Kobayashi, J. Electrochemical. Soc. 145 (1998) 3898.