Luminescence properties of a novel blue emitting phosphor by Cobalt ion doped potassium zinc diphosphat

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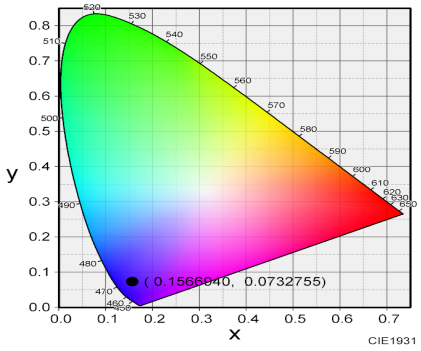
Abstract:

A new blue emitting phosphors have been successfully synthesized of $K_2ZnP_2O_7$ doped by cobalt (Co^{2+}) using solid state reaction method in air for different concentrations (1. 1.25 and 1.5 %). The samples synthesized were characterized by X-ray diffraction (XRD) which indicated that the $K_2Zn_{1-x}P_2O_7$: xCo^{2+} phases crystallize in $P4_2/mnm$ tetragonal space group, photoluminescence properties were investigated, the emission band peaking at 386 nm of Co^{2+} ion under the 249 nm excitation .The luminescence mechanism of Co^{2+} ion in $K_2ZnP_2O_7$ is debated using Tanabe-Sugano diagram. the decay curves was characterized by single exponential function and the lifetime of Co^{2+} ions in the host crystal $K_2ZnP_2O_7$ was found in the range of milliseconds. The CIE chromaticity coordinate values (x =0.156, y = 0.073) of $K_2ZnP_2O_7$:$0.01Co^{2+}$ phosphor was located in blue region.



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