

Synthesis and Photoluminescence Studies of Rare Earth Doped [1.5%] CaO
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Abstract: Several phosphors synthesized by solid state reaction method of host material CaO with five different rare earth ions as dopants. Solid state method is a very useful method to synthesize oxide phosphors, here the authors synthesized five different rare earth doped CaO with precursors of host calcium oxide and five different rare earth oxide were doped at (1.5mol%) concentration. The RE³⁺ were taken in the form of (1) Samarium oxide Sm₂O₃ (2) Europium oxide Eu₂O₃ (3) Gadolinium oxide Gd₂O₃ (4) Terbium oxide Tb₂O₃ (5) Dysprosium oxide Dy₂O₃ as raw materials. Study of photo luminescence spectra, XRD, SEM and FTIR were measured on the prepared samples. From the XRD pattern it is found that most of the phosphor is in single phase. From the peaks calculated average crystallite size is 46.5 nm using Scherer formula. From the PL study, the CaO: Eu phosphor shows, predominant red emission, CaO: Tb phosphor shows predominant green emission at 545nm, therefore these two phosphors may be a good candidates for red and green emission when used in near UV solid state light emitting diode (275nm excitation). The other CaO: Sm³⁺, CaO: Dy³⁺ and CaO: Gd³⁺ phosphors are excited with 275nm shows common emission at 470nm (blue) is nearly the same with same intensity. These phosphors may be a good blue emitting phosphors for 275nm excitable from solid state Light Emitting Diode(LED).

KeyWords: Phosphor, Photoluminescence, Calcium oxide, Excitation, Emission

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