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REDDISH ORANGE LIGHT EMITTING AND THERMAL STABILITY OF THE $SM_2O_2S/SM_2O_2SO_4$ PHOSPHORS

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A spectroscopy study of Sm^{3+} phosphors was performed through photoluminescence spectra measurements. The phosphors were prepared from the thermal decomposition of hydrated samarium sulfate to obtain samarium oxysulfide (Sm_2O_2S) and oxysulfate ($Sm_2O_2SO_4$). Reddish-orange color emission was monitored from that of oxysulfide phosphor under ultraviolet (UV) excitation at $6H_{5/2}$—>$4I_{13/2}$ (466 nm) and the photoluminescence emission properties were characterized. The Sm^{3+} oxysulfide/oxysulfate phosphors can be efficiently excited by UV and blue light, and their emission spectrum consists of three important narrow lines: $4G_{5/2}$—>$6H_{5/2}$ (575 nm), $4G_{5/2}$—>$6H_{7/2}$ (613 nm), and $4G_{5/2}$—>$6H_{9/2}$ (658 nm) intraconfigurational transitions respectively. The final thermal stability of oxysulfide/oxysulfate phosphors was investigated systematically by TG/DTG measures. Based on the results, the as prepared $Sm_2O_2S/Sm_2O_2SO_4$ materials are promising reddish-orange-emitting phosphors for UV based white light-emitting diodes.

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