

Facile Synthesis of SrWO₄:Eu³⁺ Phosphors

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Recently, synthesis of low-dimensional nanostructures is gaining more importance due to their structural properties and growing potential applications. On the other hand, luminescent materials doped with rare earth ions have drawn immense attention. The commercial phosphors are based on many host materials. Among them, tungstates are being currently investigated by many research groups owing to a wide range of applications. Tungstates are formed by different metal cations (e.g., SrWO₄, Na₂WO₄, NiWO₄, Cr₂WO₆, and ZrW₂O₈) and their structure depends on the size of the metal cation. Tungstates with large bivalent cations ($\gg 0.1$ nm) have the scheelite structure and the wolframite structure with smaller ions (< 0.1 nm). Strontium tungstate has the scheelite structure which is tetragonal with space group I41/a. The luminescent properties of the tungstate have been extensively explored in application fields such as sensors, detectors, lasers, photoluminescent devices, photo catalysts, etc. In this work, we synthesized SrWO₄ phosphors with different Eu³⁺ concentrations by using a facile route. The morphology was analyzed by using a field-emission scanning electron microscope, which exhibits the spherical shape. Transmission electron microscope image revealed the spheres composed of nanoparticles. X-ray diffraction patterns confirmed their tetragonal shape. The photoluminescence excitation and emission spectra were analyzed by varying the Eu³⁺ concentration, which shows a dominant red emission.

Keywords: SrWO₄:Eu³⁺, Phosphors, Facile synthesis