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SPECTROSCOPIC AND LUMINESCENCE STUDIES OF RARE EARTH

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ABSTRACT

Huge strides have been made in the study of nanotechnology in recent years. Need for superior materials in fields like electronics, sensors, catalysis, and biomedical science for diagnostics and therapies motivates extensive experimental research in these areas. Compared to conventional micron-sized phosphors, nanomaterials may provide several benefits. Quantum confinement owing to a high surface to volume ratio may increase the luminescence efficiency of tiny sized particles due to their unique electrical and optical properties. Bright, responsive, and stable phosphors are in high demand for use in today's luminescence technology. Nevertheless, sulphide phosphor, which is doped with rare earth (RE) and transition metal ions (TMI), is not stable in high vacuum and generates corrosive gas when subjected to electron bombardment, while having strong luminous qualities. Some of the NPs are used in solar energy storage, optical amplifiers, and Thermoluminescence dosimeters, whereas others demonstrated poor optical characteristics unsuitable for these applications (TLD). Nanomaterials (NMs) are used in modern technology for a wide variety of purposes, such as a catalyst, in sensors, in composite materials with multiphase characteristics, and in the downsizing of equipment.