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Synthesis and Characterization of Y₂O₂S:Eu Nanophosphors Using Sol-combustion Method

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< Rare earth oxysulfide materials exhibit high luminescence efficiency as well as excellent chemical stability.</p> These materials are widely used as luminescent host materials of several commercially available red emitting phosphors. However, there still remain issues affecting the operational parameters such as luminescence efficiency, stability against temperature, high color purity and long afterglow. Y₂O₂S:Eu nano powders were prepared by low-temperature synthesis method using sulfur-contained organic fuel in an ethanol-aqueous solution. The prepared nano powders were characterized by Scanning electron microscope, X-ray diffraction, photoluminescence spectra and X-ray photoelectron spectroscopy. It is shown that the assistant fuel ethanol has the effect of decreasing the water needed, simplifying the experiment procedure by dissolving rare earth nitrate and sulfur-contained organic fuel into an even solution, and prompting the formation of rare earth oxysulfide by igniting first during heating that leads to combustion decomposition reaction. Y₂O₂S:Eu nano crystallines with strong photoluminescence and X-ray luminescence are obtained using thiourea as organic fuel. Mixtures of Y₂O₃Eu and Y₂O₂S:Eu are acquired using thiourea as fuel, and the content of Y₂O₂S:Eu increases until reaches to about half of the Y₂O₃:Eu with the increasing amount of thiourea. Y₂O₂SO₄:Eu emerges when S/Y=6 and increases with increasing thiourea content.

Level (Hons, MSc,
 PhD, other)?

PhD

Consider for a student
 award (Yes / No)?

Yes

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

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