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EVALUATION OF LUMINESCENT PROPERTIES OF CERAMIC POWDERS OF THE $\text{CeO}_2:\text{Eu}_2\text{O}_3$ SYSTEM

In recent years, materials based on rare earth oxides have gained great importance in modern technology, due to the innovative properties they have. For application in different scientific-technological branches, ranging from the synthesis of hybrid materials to the development of new ceramic materials. The study of nanoparticles based on cerium oxides using the sol-gel method has become of great interest, because this method allows control through various parameters (lower temperatures than in other methodologies) such as: crystalline structures of materials, morphologies, sizes and obtaining products with a high degree of purity. This allows us to undertake a more complete study of the properties that this matrix has. In addition to the possible applications that can be developed, due to its unique properties. The focus of this work is the synthesis of undoped ceramic powders, with doping and mixtures with europium oxide using the sol-gel method, to obtain gels with molar concentrations ($\text{Ce:Eu} = 100:0, 98:2, 95:5, 92:8, 90:10, 70:30$). The gels will be thermally treated at a temperature of 700 °C for 24 hours, to promote their crystallization and subsequently reveal the crystalline structure. Finally, the products obtained will be characterized structurally and morphologically. Its luminescent properties will be studied using infrared spectroscopy (IR), energy dispersive X-ray spectroscopy (EDX), scanning electron microscopy (SEM) and photoluminescence. These studies will allow establishing a correlation between their properties, revealing their structural and luminescent properties to understand the behavior of these materials and thus expand their field of application.

Keywords

Rare-earths, Europium, Luminescence, Cerium, Sol-gel.

Reference

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Author approval

I confirm

Author will attend

I confirm

Primary authors: Ms GONZÁLEZ GARCÍA, María del Rosario (Instituto Politécnico Nacional-Centro de Investigación e Innovación Tecnológica); Dr GARCÍA MURILLO, Antonieta (Instituto Politécnico Nacional, Centro de Investigación e Innovación Tecnológica); Dr CARRILLO ROMO, Felipe de Jesús (Instituto Politécnico Nacional, Centro de Investigación e Innovación Tecnológica); Mr CABRERA RÍOS, Israel Donato (Instituto Politécnico Nacional, Centro de Investigación e Innovación Tecnológica)

Presenter: Ms GONZÁLEZ GARCÍA, María del Rosario (Instituto Politécnico Nacional-Centro de Investigación e Innovación Tecnológica)

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