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Low-Temperature Luminescence Spectroscopy of Violet Sr-Al-O:Eu2+ Phosphor Particles

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Abstract : Violet Sr–Al–O:Eu2+ phosphor particles were synthesized from a metal–ethylenediaminetetraacetic acid (EDTA) solution of Sr, Al, Eu, and particulate alumina via spray drying and sintering in a reducing atmosphere. The crystal structures and emission properties at 85–300 K were investigated. The composition of the violet Sr–Al–O:Eu2+ phosphor particles was determined from various Sr–Al–O:Eu2+ phosphors by their emission properties' dependence on temperature. The highly crystalline SrAl12O19:Eu2+ emission phases were confirmed by their crystallite sizes and the activation energies for the 4f5d–8S7/2 transition of the Eu2+ ion. These results showed that the material identification for the violet Sr–Al–O:Eu2+ phosphor was accomplished by the low-temperature luminescence measurements.

Keywords : low temperature luminescence spectroscopy, material identification, strontium aluminates phosphor, emission properties
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