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Influence of alkaline earth metal cations; Ca²⁺, Sr²⁺ and Ba²⁺ on the structural and optical properties of MAl₂O₄: Eu²⁺, Nd³⁺ phosphors.

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Abstract content
   (Max 300 words)
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Eu²⁺ doped and Nd³⁺ co-doped MAl₂O₄:Eu²⁺, Nd³⁺ (M = Ca, Sr, and Ba) phosphors were prepared by a solution-combustion method. XRD analysis depicts a monoclinic phase for CaAl₂O₄:Eu²⁺, Nd³⁺ and SrAl₂O₄:Eu²⁺, Nd³⁺ and a hexagonal structure for BaAl₂O₄:Eu²⁺, Nd³⁺ phosphor. SEM results showed generally agglomerated particles with non-uniform shapes and sizes with irregular network structures having lots of voids and pores. PL revealed broadband spectra corresponding to the 4f⁷-4f⁶5d¹ absorption and emission of Eu²⁺.Sharp emission lines were observed at 612 and 652 nm for CaAl₂O₄:Eu²⁺, Nd³⁺, at 615 nm for SrAl₂O₄:Eu<sup>2+</ Nd³⁺ and at 610 nm for BaAl₂O₄:Eu²⁺, Nd³⁺ arising from the f-f transitions of the Eu³⁺ ions. The differences in emissions arise from the crystal field splitting of the 5d electron shell due to the changes in the crystalline environment of the Eu²⁺ ions caused by the substitution of the divalent alkaline earth metal cations in the host lattice.UV-VIS spectra showed absorption edges at 330,342 and 340 nm in agreement with the observed PL excitation peaks.

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Dejene B.F
dejenebf@qwa.ufs.ac.za
University of the Free State

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Primary author: Mr WAKO, ALI HALAKE (University of the Freestate)

Co-authors: Prof. DEJENE, Francis (University of the Free State); Prof. SWART, Hendrik (University of the Free State)

Presenter: Mr WAKO, ALI HALAKE (University of the Freestate)

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