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Synthesis and characterization of Ce³⁺ doped NaMPO₄ (M= Mg, Ca, Sr and Ba) phosphors

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Cerium (Ce³⁺) doped alkaline-sodium-phosphate or NaMPO₄ (where M= Mg, Ca, Sr and Ba) phosphors were prepared by solution combustion method with different doping concentrations of Ce³⁺ (0.5 mol %, 1.0 mol % and 1.5 mol %). X-ray powder diffraction (XRD) and scanning electron microscope (SEM), were used to analyse the crystalline structure and particle morphology of the samples, respectively. The optical properties including reflectance, excitation and emission were investigated using UV-Vis absorption spectroscopy and photoluminescence (PL) spectroscopy while stretching modes and electronic and chemical composition were analyzed using Fourier transform infrared spectroscopy and X-ray photoelectron spectroscopy. The XRD and SEM results confirm that the samples contain mixture of phases of crystals. The excitation spectrum of the phosphors were characterized by broad band extending from 250 to 400 nm. The PL emission spectrum of the sample showed a broad band located between 310 and 400 nm in the UV range, which is due to the allowed $4f^{0}5d^{1} \rightarrow 4f^{1}5d^{0}$ transition of Ce³⁺ ions. The effects of Mg²⁺, Ca²⁺, Sr²⁺ and Ba²⁺ substitution on the particle morphology and photoluminescence emission intensity will be reported.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

Main supervisor (name and email) and his / her institution

Ntwaeaborwa O.M ntwaeb@gmail.com University of the Witwatersrand
 Swart HC swarthc@ufs.ac.za university of Free state
 Reddy K krishr@uj.ac.za university of Johannesburg
 Avula B balakrishna.veera@gmail.com university of free state

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

No

Primary author: Ms MALEKA, Prettier Morongoa (Yes)

Presenter: Ms MALEKA, Prettier Morongoa (Yes)

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