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Effect of annealing temperature on the structure, morphology and luminescence properties of mixed phases SrAl2O4/Sr3Al2O6/SrCO3:0.05% Gd^{3+} nanopowders prepared by citrate sol-gel method

Thursday, 11 July 2019 15:00 (2 hours)

Mixed phases of SrAl2O4/Sr3Al2O6/SrCO3:0.05% Gd3+ nanopowders were prepared via citrate sol-gel method. The effect of annealing temperature (AT) at the fixed dopant concentration (0.05Gd3+) on the structure, morphology and photoluminescence properties of the nanopowders were investigated. X-ray diffraction (XRD) showed that the prepared nanopowders consist of the mixture of monoclinic (SrAl2O4), cubic (Sr3Al2O6) and orthorhombic (SrCO3) structures. It is revealed that crystallite sizes is influenced by the AT. The scanning electron microscope (SEM) images shows that the AT has an influence on the particle morphology of the prepared nanopowders. Transition electron microscope (TEM) showed that the crystallites sizes are in the nanoscale. The photoluminescence (PL) showed that when samples were excited with 272 nm, two emission peaks at 431 nm (violet) and 541 (green) were observed and they are attributed to the defects level within the alumina (Al2O3). The international commission on Illumination (CIE) colour showed that the samples were in the Violet region and the emission colour cannot be tuned by AT.

Apply to be
 considered for a student
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yes

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

Msc

Primary authors: Mr DLAMINI, Clinton (SMU); Prof. MOTLOUNG, Setumo Victor (SMU)

Presenter: Mr DLAMINI, Clinton (SMU)

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