

Morphology and composition of strontium calcium aluminate matrix doped with Dy(3+)

Abstract:

The aim of the present study was to determine the influence of doping rare earth ion on strontium calcium aluminate (CaO-SrO-SiO₂-Al₂O₃). Therefore, the authors have manufactured luminescent material consisting of 40CaO-5SrO-5SiO₂-50Al₂O₃ doped with Dy³⁺. The compositions have been selected on the basis of chemical stability. Five pellets were prepared with different calcination temperatures and times, namely 400 and 600°C for 1 and 2 h, in order to shed light on their luminescence behaviour. X-ray diffraction, energy dispersive X-ray analysis and scanning electron microscopy elaborate and characterise the formation of small particle of photoluminescent material in the phosphor matrix host material.