Optical studies of crystalline ZnO-SiO2 developed from pyrolysis of coconut husk

ABSTRACT

In this paper, the ZnO–SiO2 was synthesized using ZnO nanopowders and SiO2 developed from coconut husk ash by using conventional solid state method. The ZnO–SiO2 crystal system was heat-treated and the properties was studied. The XRD results showed high intensity peaks due to its high crystallinity when sintered at high temperature. The morphological differences can also be observed through FESEM images as the heat-treated crystal system showed well-distinct boundaries. Meanwhile, the absorbance intensity decreased and shifted to the lower wavelength after heat-treated. The optical band gap value of the ZnO–SiO2 was 3.22 eV before treated and increased to 4.05 eV after heat treated. The presented results showed good properties of zinc silicate and it has a great potential as phosphors in optical application.

Keyword: Optical; Coconut husk ash; XRD; Structural; Zinc silicate