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Abstract
In this thesis, solid state method is used to synthesize proportioned nano-ZnO and SiO2 powders into Zn2SiO4 phosphor, and to achieve better control on grain size and grain shape than traditional powder. With different sintering conditions, the effect of the luminescent intensity due to sintering temperature and the concentration of activator would be discussed by the X-Ray Diffraction, photoluminescence spectrometer and Field Emission Gun Transmission Electron Microscope. In addition, the characterization of crystalline structure, efficiency of luminescence, and microstructure of phosphor particles would also investigated.
As the results shown, the grains grow better and ZnO vaporized as the sintering temperature increases, it is found that the efficiency of luminescence increases obviously just only little amount of MnO2 is doped. From the results of XRD, pure willemite crystalline phase could be produced at 800 ℃ and becomes more complete at 900℃. In this research, the optimum luminescent intensity would be gained as sintered in N2 (1300℃) and 2mol% of activator was doped.
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