

Synthesis and Characterization of ZnO/NiO Composite Nanoparticles via Solution Process

Mohammad Vaseem, 홍동민, 김정현, 김진석, 김상훈, 한윤봉*
전북대학교 반도체 화학공학부
(ybhahn@chonbuk.ac.kr*)

Materials with nanometer size particles exhibit unique chemical and physical properties. In particular, nanocomposite materials composed of nanometric metal and metal oxide particles embedded in vitreous matrices, present a variety of interesting magnetic, electric, and catalytic properties. We have reported, ZnO/NiO composite nanoparticles prepared by using solution process. The precursor of as synthesized composite material was firstly mixed via solution process with assistance of ultrasonication, and then by high temperature calcinations at 450 °C were produces uniform 10–30 nm ZnO/NiO composite nanoparticles. To check the effect of calcinations on as synthesized composite products, we have performed several experiment based on timed calcinations i.e. 1h, 2h, and 3h calcinations times. Interestingly, we have found that timed calcinations have a prominent effect on size and aggregation of as synthesized composite nanoparticles. The ration of NiO and ZnO in ZnO/NiO composite nanoparticles was confirmed by EDS spectra. Various analysis techniques such as FESEM, X-ray diffraction pattern (XRD), FTIR, UV-Vis, high-resolution TEM and TGA/DTA were employed to investigate the structural and optical properties of the as-grown composite ZnO/NiO nanoparticles in detail.