

Conference Abstract

Sintering properties of ZnO-TiO₂ composite ceramics

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Abstract

Among various semiconductor oxides, ZnO and TiO₂ composite have been used wide variety of applications such as solar cells, varistors, and sensors. In this work effect of sintering temperature and sintering time on ZnO - TiO₂ composite were studied. Five different mole ratio (ZnO : TiO₂ = 9:1, 4:1, 7:3, 3:2, and 1:1) of ZnO and TiO₂ powder was mixed by using mortar and pestle. Mixed powder was pressed into palette before sintered at temperatures 600, 700, 800, 900 and 1000°C for one and two hours. In order to obtain reference pattern, pure ZnO and TiO₂ also sintered. Sintered samples were then characterized by using X ray Diffraction Spectrometer (XRD). At the sintering temperature 600°C, only the peaks corresponding to ZnO and TiO₂ was observed. Regardless of mole ratio, Zn₂TiO₄ and Zn₂Ti₃O₈ composites were started to develop at the sintering temperature 700°C for one hour. The developed peaks corresponding to Zn₂TiO₄ and Zn₂Ti₃O₈ were matched with JCPDS number 00-002-1033 and 00-013-0471 respectively. XRD Pattern for ZnO-TiO₂ composite along with pure ZnO and TiO₂ sintered at 1000°C for two hours is shown in the Figure. According to the XRD pattern, as the sintering time is increased, additional peaks corresponding to ZnTiO₃ (JCPDS number 00-015-0591) also started developed at 700°C. Phase development of the composite is increased with increasing sintering temperature and sintering time.

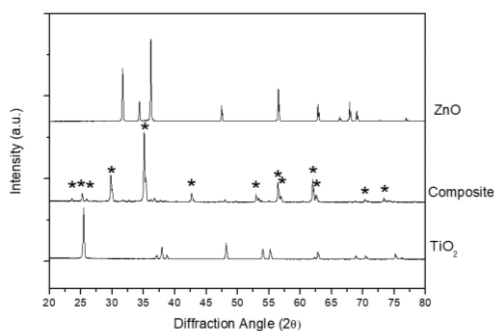


Figure: XRD Pattern for Pure ZnO, TiO₂, and ZnO-TiO₂ composite. Newly developed peaks are marked by ‘*’

Keywords: ZnO-TiO₂ composite, XRD, Sintering

Acknowledgement: Authors acknowledge the Capacity Building and Establishment of a Research Consortium (CBERC, LKA-3182-HRNCET) grant for XRD instrument.