

## Fabrication and Luminescence Property of Zinc Sulfide by Mechanical Alloying

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Zinc sulfide (ZnS), as a II. VI semiconductor with a band-gap energy of 3.66 eV, has received a lot of attention due to its excellent properties, such as large band-gap energy, direct recombination and resistance to high electric field. ZnS is a direct band-gap material and has great potential being an optoelectronic material, such as solar cells and infrared windows. ZnS is also a famous phosphor material with various luminescence properties, such as photoluminescence (PL), and electroluminescence (EL) and so generally used in the fields of displays, sensors, and lasers. The aim of this work is the study of the fabrication and luminescence property of zinc sulphide prepared by mechanical alloying method by a horizontally high-energy attritor

For the mechanical alloying method of zinc sulphide the starting mixture of zinc (Han Chang Co., Korea) with sulphur (Samchun Pure Chemical Co., Korea) was prepared in weight ratio Zn:S = 2.04. and sealed in vial in an argon atmosphere. The milling was carried out in a horizontally high-energy attritor-type (Zoz Simoloyer) with stainless steel vials (volume 500ml) and balls (6mm in diameter) milling time : 1-10 hours with a discontinuous rotating speed of 1000rpm for 4minutes and 300rpm for 1minutes. Phase identification of the powder was performed by Cu K $\alpha$  x-ray diffraction. Morphologies of the powder were examined with a SEM. Luminescence properties of the powder were measured a OMA(Optical Multichannel Analyzer)

The X-ray diffraction patterns of ZnS powders mechanical alloyed at different times. X-ray diffraction pattern confirmed the presence of  $\alpha$ -ZnS and sphalerite  $\beta$ -ZnS as the only product. The ratio of hexagonal to cubic decreases as the MA times increases.