

# The properties of ZnS thin films prepared by low-temperature sulfidation

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Zinc sulfide (ZnS) is one of the first semiconductors discovered. It has the greatest band gap among the II-VI compound semiconducting materials. With the good optoelectronic properties, ZnS has been widely used in many optoelectronic devices. The preparation and physics of good quality ZnS thin films has always been one of the focuses of the research on the wide band gap material. In the article, ZnS thin films were prepared on the glass substrates by annealing Zn thin films in sulfur vapor and Ar gas, which were deposited by magnetron sputtering from a zinc target. The microstructure defects, crystallizations, surface morphology and optical properties of the samples were analyzed by PAT(positron annihilation technique), XRD(X-ray diffraction), SEM(scanning electron microscopy) and UV-VIS spectrophotometer. The resultant ZnS thin films exhibits a good optical transmittance and the better S/Zn atomic ratio compared with those samples prepared by sulfidation in the vacuum-sealed quartz-glass ampoules.

## Abstract Type

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