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Simulation and fabrication of nanostructured ZnS/Metal/ZnS films and study of their structural and optical properties

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Abstract: Conductive transparent ZnS/M/ZnS, (M = Au, Ag, Cu, Al) nano-structures have been simulated by optimization layers thickness, and gold, silver, copper, and aluminum materials were used as a metal layer and zinc sulfide for dielectric layers. Then the optimum simulated structure has been fabricated on a glass substrate by thermal evaporation. The crystallinity properties of the structures, such as grain size and lattice parameters, have been calculated from XRD pattern. The optical transmittance and absorption spectra show that the structures are absorber of the ultraviolet and infrared and transparent against visible lights. These results were confirmed by calculated figure of merit and luminous transmittance and measuring the rate of heat dissipation.

Keyword: *Zinc sulfide; thin film; three layer nanostructures; simulation; thermal evaporation.*

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