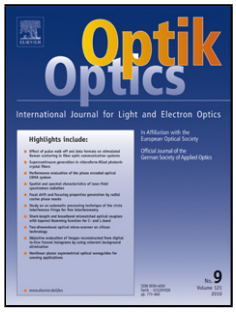

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Improve the Efficiency of UV-Detector by Modifying the Si and Porous Silicon Substrate with ZnS Thin Films

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Abstract

In this work we prepared Zinc Sulfide (ZnS) thin films by chemical spry pyrolysis (CSP) technique using different substrate temperature. The substrate used was Silicon (Si) and Porous Silicon (PS). The PS was fabricated using electrochemical etching technique (ECE). The PS results show the Nano-structure and the reduction of the reflection in order to improve the light conversion for optoelectronics and higher band-gap obtained from Photoluminescence (PL) analysis. The ZnS structure has a cubic form along with (111) orientation and the ZnS optical band-gap has increased as substrate temperature increased. PL has also studied. Finally we deposited the optimum results of ZnS on Si and PS and measure the respositivity, quantum efficiency and detectivity. The efficiency has increased from 1.4 % to 24 % for the UV region.

Keyword: Crystalline Silicon; Porous Silicon; Zinc Sulfide; physical properties; UV detector.