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PREPARATION AND CHARACTERIZATION OF ZINC OXIDE ON AU-COATED NANOSTRUCTURED POROUS SILICON SUBSTRATE BY THERMAL-CVD

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ABSTRACT

Zinc oxide (ZnO) samples have been prepared on nanostructured porous silicon (NPSi) substrate by vapor phase Thermal-CVD method. The NPSi have been prepared by electrochemical etching method in the mixture of hydrofluoric acid and ethanol electrolyte using an optimized parameter. Then the as-prepared NPSi sample was sputtered by Au-sputter coater to form a catalyst on top of the NPSi subtrate. Vapor process by Thermal-CVD was employed at low deposition temperature ranging from 400 -600 ºC. The samples were characterized using scanning electron microscopy (SEM), X-ray diffractometer (XRD) and photoluminescence spectroscopy (PL). SEM micrograph and XRD spectra confirm the growth of ZnO structure and indicates the sample formed a wurtzite structure of ZnO while PL spectra showed that the PL intensities increases as the deposition temperature increases. An estimated bandgap energy from PL observation of the ZnO samples are in the range of 3.118- 3.133 eV.

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