



ChemTech

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.12 No.03, pp 251-260, 2019

Structural and Optical properties of ZnO/PS nano composite before and after vacuum annealing treatment

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Abstract : The nanocrystalline ZnO thin film was coated on porous silicon substrate by sol-gel spin coating method. Porous silicon (PS) substrates were prepared by electrochemical anodization on p-type silicon wafers of (100) orientation for various current densities. Surface modification of PS by ZnO and its structural and optical properties before and after vacuum annealing treatment were studied. It is observed that (002) oriented ZnO thin film was formed on PS substrate. It is found that the size of ZnO grains is 49 nm and after vacuum annealing treatment the grain size of ZnO on PS increases from 49 to 61 nm. SEM images show that the pore filling of ZnO on PS. The 493 nm^{-1} stretching mode vibration of ZnO was observed for ZnO/PS nanocomposite. The PL peak intensity increases due to vacuum annealing treatment.

Key words: Porous silicon, ZnO/PS, XRD, SEM, PL, vacuum annealing.

Lakshmipriya Venugopal *et al* /International Journal of ChemTech Research, 2019,12(3): 251-260.

DOI= <http://dx.doi.org/10.20902/IJCTR.2019.120332>
