عنوان مقاله:

Control capability of electrolytic concentration on refractive index and dielectric constant of porous Silicon layers

محل انتشار:

مجله بین المللی ابعاد نانو, دوره 6, شماره 3 (سال: 1394)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Porous Silicon (PS) samples have been prepared by electrochemical anodization of p-type silicon wafer by varying HF concentrations in the electrolytic solution. The structural, surface morphological, optical and surface composition analysis of the prepared samples were done by X-ray diffraction (XRD), Scanning electron microscopy (SEM), Photoluminescence (PL) and Fourier transform infrared (FTIR) spectroscopy studies respectively. The grain sizes of PS were determined by XRD study. The porosity of PS samples was estimated by using the parameters obtained from the SEM images by the geometrical method. The porosity of the samples was found to vary between ۱۱% and ۸۴% due to the variation in HF concentration in the electrolytic solution. The refractive index and dielectric constant values of PS as a function of porosity were determined by Effective Medium Approximation methods. Strong visible emission peak at ۴۹۸ nm, with no apparent shift with respect to variation in etching parameter, is observed in Photoluminescence study. The surface bonding and their vibration modes of the PS were determined by transmission FTIR spectroscopy.

کلمات کلیدی:

Porous Silicon, HF concentration, Porosity, Refractive index, Dielectric constant, Photoluminescence