

The correlation of blue shift of photoluminescence and morphology of silicon nanoporous

ABSTRACT

Porous silicon with diameters ranging from 6.41 to 7.12 nm were synthesized via electrochemical etching by varied anodization current density in ethanoic solutions containing aqueous hydrofluoric acid up to 65mA/cm². The luminescence properties of the nanoporous at room temperature were analyzed via photoluminescence spectroscopy. Photoluminescence PL spectra exhibit a broad emission band in the range of 360-700 nm photon energy. The PL spectrum has a blue shift in varied anodization current density; the blue shift incremented as the existing of anodization although the intensity decreased. The current blue shift is owing to alteration of silicon nanocrystal structure at the superficies. The superficial morphology of the PS layers consists of unified and orderly distribution of nanocrystalline Si structures, have high porosity around (93.75%) and high thickness 39.52 μm .

Keyword: Diameters; Electrochemical etching; Photoluminescence; Porosity; Porous silicon