Determination of Thickness of Electrochemically Etched Si Layers Passivated by Si_3N_4 by Analysis of the Experimental Spectral Reflectance

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Abstract. Porous silicon (pSi) samples for photovoltaics applications were prepared by the method of electrochemical etching in the hydrofluoric acid (HF) solution. P-type silicon wafers (boron-doped) were used as substrate. Different parameters of the electrochemical etching method (electrical potential and current, etching time) have been used in the production of pSi samples. Optical properties of pSi samples were experimentally studied by UV-VIS spectrometer. The thickness of the porous layer formed on the Si substrate surface was determined by using theoretical model of spectral reflectance. Effective medium approximation theory (Looyenga) was used in construction of this theoretical model.