# Silicon Surface Treatment Effect on the Structural, Optical, and Optoelectronic Properties for Solar Cell Applications

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**Abstract :** Metal-nano particle-assisted Chemical Etching is an extraordinary developed wet etching method of producing uniform semiconductor nano structure (nano wires) from patterned metallic film on crystalline silicon surface. The metal films facilitate the etching in HF and H2O2 solution and produce silicon nanowires (SiNWs). Creation of different SiNWs morphologies by changing the etching time and its effects on optical and opto electronic properties was investigated. Combination effect of formed SiNWs and stain etching treatment in acid (HF/HNO3/H2O) solution on the surface morphology of Si wafers as well as on the optical and opto electronic properties are presented in this paper.

**Keywords :** stain etching, porous silicon, silicon nanowires, reflectivity, lifetime, solar cells
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