

## **Silicon Nanostructure Based on Metal-Nanoparticle-Assisted Chemical Etching for Photovoltaic Application**

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**Abstract :** Metal-nano particle-assisted chemical etching is an extraordinary developed wet etching method of producing uniform semiconductor nanostructure (nanowires) from the patterned metallic film on the crystalline silicon surface. The metal films facilitate the etching in HF and H<sub>2</sub>O<sub>2</sub> solution and produce silicon nanowires (SiNWs). Creation of different SiNWs morphologies by changing the etching time and its effects on optical and optoelectronic properties was investigated. Combination effect of formed SiNWs and stain etching treatment in acid (HF/HNO<sub>3</sub>/H<sub>2</sub>O) solution on the surface morphology of Si wafers as well as on the optical and optoelectronic properties are presented in this paper.

**Keywords :** semiconductor nanostructure, chemical etching, optoelectronic property, silicon surface

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