# Silicon Nanowires fabrication and surface nanostructuration by Metal Assisted Chemical Etching

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**Abstract**

More than 90% of the market for commercial solar cells consists on silicon (Si) based cells because Si is the second most abundant element on Earth and is the best component in the integrated circuit industry [1].

However, the silicon based solar cells low rate-cost ratio makes them less competitive with fossil fuels; and researchers must continue to devote enormous efforts to increase the power conversion efficiency (PCE) and reduce the manufacturing cost.

The silicon surface nanostructuration have created a big interest as promising materials for advanced devices for solar energy conversion and electronic application. This interest is due to their unique structural, electrical and optical properties.

Intensive researches were conducted in recent years on such nanowires fabrication methods to make anti-reflective surface structures (texture structure) in order to increase the silicon based solar cells conversion efficiency.

In this paper, we present silicon Nano-structuration produced by Silver, Aluminium, copper, Zinc and iron assisted chemical etching for different etching time on <100> oriented p-type Si. The scanning electron microscopy (SEM) was used to evaluate the surface morphology. The results show that the latter is totally different from a metal to an other one. The Cu and Zn assisted etching provides pyramidal nanostructured surface of the silicon and zinc oxide thin film deposition on the Si surface respectively. An EADS analysis was performed to confirm the zinc oxide crystallization.

**Keywords:** Nanostructure, nanowires, nanopores, silicon, metal, etching, SEM.

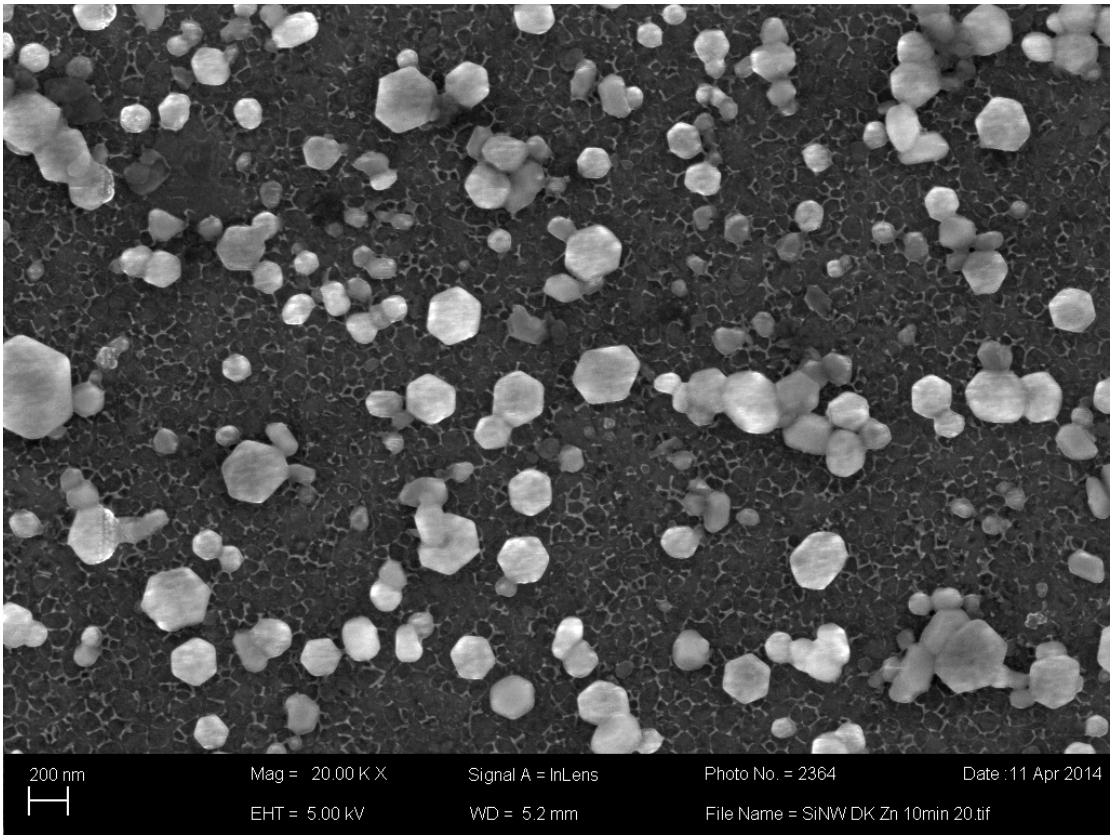


**Figure 1:** SEM image of Si surface nanostructured by Zn assisted chemical etching.

**Reference**

[1] Tien-Chung Yang, Bi-Shen Lee, and Ta-Jen Yen, Appl. Phys. Lett. 101, 103902 (2012)