

# ZnO nanowires grown on cone-shaped zinc nanostructures by thermal oxidation

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ZnO nanowires are grown on cone-shaped zinc nanostructures by thermal oxidation. The zinc nanotips are fabricated on polycrystalline zinc foils by oxygen ion beam sputtering [1]. The as-prepared cone-shaped zinc nanostructures have an average height of 1.5  $\mu\text{m}$  and an aspect ratio of 3. The cone-shaped zinc nanostructures are annealed at 410°C in flowing oxygen ambient for one hour. After thermal oxidation, needle-shaped nanowires are found that grown outwardly from cone-shaped zinc nanostructures. The width of the ZnO nanowire varies from 20 to 200 nm, while its length varies from hundredth of nanometers to several microns. Photoluminescence study of the ZnO nanowire shows a strong near band edge emission at 376 nm. Field emission properties and the effect of electric field on the growth direction of the ZnO nanowires will be presented. This provides a convenient route for the fabrication of ZnO nanowires for field emission flat panel display applications.

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1. L. C. Chao, C. C. Liao, J. W. Lee, and F. C. Tsai, *J. Vac. Sci. Tech. B* **25**, 2168 (2007).

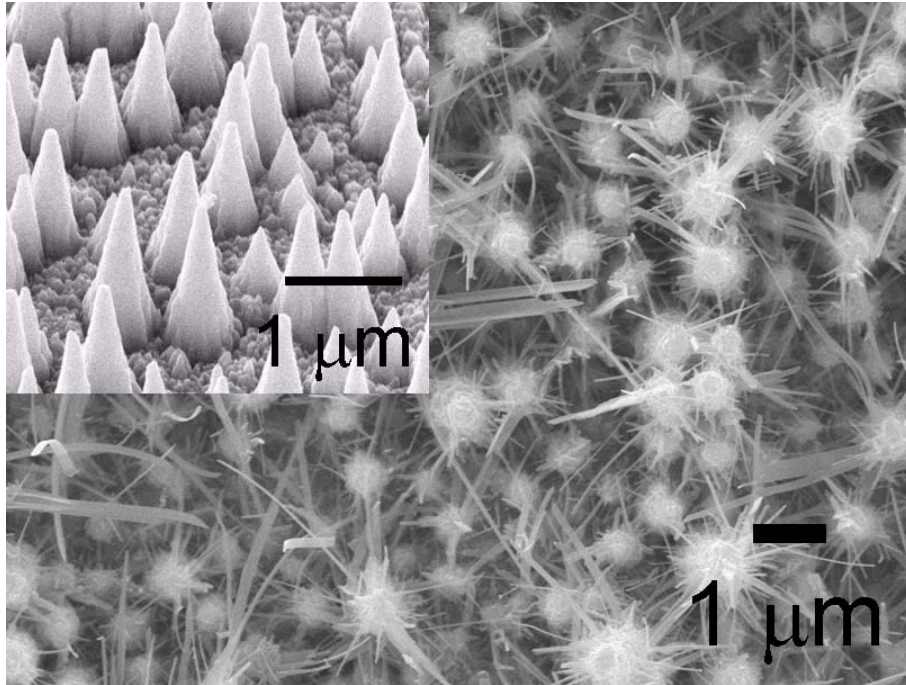


Figure 1. ZnO nanowires grown on cone-shaped zinc nanostructures by thermal oxidation. The insert shows cone-shaped zinc nanostructures before thermal oxidation.