

Electrical and mechanical property of ZnO wire using catalyst-free chemical vapor deposition

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In this paper, we synthesize ZnO wire on Si substrate by catalyst-free thermal chemical vapor deposition (CVD). Each ZnO wire is grown up at different conditions such as temperature and O₂ flow rate. The Young's modulus of individual ZnO wires were estimated using quasi-static and dynamic measurements, as well as resonance frequency measurements. Using this system, current-voltage characteristics of each ZnO wire structure fabricated on a trench were measured. A new concept of electromechanical device structure combined with the piezoelectric effect of ZnO will be suggested in the end of this paper.

Keywords: ZnO, wire, chemical vapor deposition (CVD), Young's modulus