

Fabrication of ZnO nanowire gas sensors by bottom-up and top-down approaches

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ZnO nanowires are crystalline structures with precise chemical composition, surface terminations, and dislocation-defect free. Their nanosized dimension generates the inherent properties that can be significantly different from their bulk materials. Therefore, ZnO nanowires have been applied for solid-state gas sensors due to the high specific surface of nanostructures. We demonstrated that the ZnO nanowire gas sensors could be fabricated by both bottom-up and top-down approaches. Each nanowire gas sensors showed highly sensitivity to hydrogen and carbon monoxide. In addition, we discussed the effect of the catalyst decorations and plasma treatments of ZnO nanowires for the purpose of the performance improvement of gas sensor.