Sol-Gel Synthesis of ZnO Nanorods for Ultrasensitive Detection of Acetone

Authors: Kashif, M.; Ali, M. E.; Ali, Syed M. Usman; Foo, K. L.; Hashim, U.; Willander, Magnus

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Abstract:
ZnO nanorods were synthesized on low cost thermally oxidized silicon substrate using a simple and easily performable sol-gel spin coating technique followed by hydrothermal growth. C-axis orientation, good crystalline properties and less structural defects containing ZnO nanorods of diameter < 70 nm were obtained. These were confirmed through XRD, FESEM and photoluminescence analysis. The nanostructured ZnO was tested for detecting acetone, a hazardous and irritant gas frequently used in industries. The fabricated nanorods exhibited excellent acetone sensing properties in a home-made gas chamber at 325 °C. The detection limit was 0.05 ppm of acetone and the response time was 8 s. The easy preparation and high sensitivity of the nanorods ZnO suggested its feasibility to be used in acetone sensing devices.

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