

Highly Sensitive and Fast Responding CO sensor using SnO₂ Nanosheets

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A highly sensitive and fast responding CO sensor was fabricated from a sheet-like SnO₂. The SnO sheets were prepared by a room temperature reaction between SnCl₂, hydrazine and NaOH, and they were subsequently oxidized into SnO₂ sheets at high temperature (600°C). The morphology and size of the SnO₂ sheets could be controlled during the formation of SnO, which influence the sensor response (R_a/R_g) and response time to a great extent. The sensor response of SnO nanosheets to 10 ppm CO was enhanced up to 2.34, and the 90% sensor response time could be reduced to 6 s, which are significantly higher and shorter than those of SnO₂ powders (1.57 and 88 s), respectively. The realization of both a high sensitivity and rapid response were explained in terms of rapid gas diffusion onto the entire sensing surface due to the less-agglomerated and very thin structure of SnO₂ nanosheets and the catalytic effect of Pt.

Keywords: SnO; SnO₂ Nanosheets; Gas Sensor; Solution reduction method