Synthesis of SnO$_2$ Nanowires their Structural and H$_2$ Gas Sensing Properties

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Abstract

SnO$_2$ nanowires were prepared on bare oxidized silicon, Au and SnO$_2$ coated substrates by thermal evaporation of tin grains in argon atmosphere at 900°C. X-ray diffraction (XRD) and field-emission scanning electron microscopy (FE-SEM) were used to characterize the SnO$_2$ nanowires. FE-SEM images indicated that the size of SnO$_2$ nanowires depend on the type of substrate. Gas sensor was fabricated by dispersing SnO$_2$ nanowires on an interdigitated Pt-electrode. H$_2$ gas sensing properties of these sensors made of nanowires prepared on three different substrates were measured at various operating temperatures and concentrations respectively. SnO$_2$ nanowires deposited on Au-coated substrates showed the highest sensitivity of 11.5 at 100°C upon exposure to H$_2$ gas of 1000 ppm.
Keywords: SnO2; Nanowires; Gas sensor; Hydrogen

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References