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Carbon Nanotube Sensor for NH₃, NO₂ and H₂ Gas Detection

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There is a great need for sensing chemical species and gases for environmental and industrial applications. Carbon nanotube (CNT)-based sensors offer advantages of high sensitivity and fast response at room temperature in compared to conventional chemical sensors which usually operate at high temperatures. We also investigated the adsorption of NH₃, NO₂, and H₂ gas molecules on carbon nanotubes theoretically and sensing performance of the CNT device for sensor application experimentally. Sensor device was prepared by simple drop deposition of CNT solution over two gold electrodes which were pre-patterned on the oxidized Si wafer. Then the performance of CNT sensor was characterized by the I-V measurement in a controlled gas atmosphere. We can find the variation of electrical conductivity in different gas atmosphere. This conductivity change will be explained in the point of electron charge transfer between CNT and gas molecules.