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A Vanadium Oxide Nanotube-Based Nitric Oxide Gas Sensor

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Accurately measuring exhaled nitric oxide (eNO) is still an unsolved problem. We report the fabrication of a novel nanotube-based gas sensor. The gas sensor consists of a gas-responsive multiwall vanadium oxide nanotube (VO_X-NT) layer deposited on a ceramic chip with two Ag-Pd electrodes, a gas sensor signal collecting system and a computer data-processing system. The absorption of different gases in the VO_X-NT layer changes the permittivity and conductivity of the material and consequently alters the voltage of the sensor. By measuring the voltage change of the sensor, different gas concentrations can be determined. Our results show that the sensor response to nitric oxide (NO) is both highly sensitive and reversible at room temperature. The VO_X-NT-based gas sensor only reponds to NO and water vapor in the exhaled air, and the response is concentration dependent. We suggest that the novel sensor can meet the demands of clinical diagnosis.

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