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ZnO nanowire-based CO sensor MON-SHU HO, Physics Department, National Chung Hsing University, WEI-HAO CHEN, Institute of Electronics Engineering, National Tsing Hua University, YU-LIN CHEN, Physics Department, National Chung Hsing University, MENG-FAN CHANG, Institute of Electronics Engineering, National Tsing Hua University — This study applied ZnO nanowires to the fabrication of a CO gas sensor operable at room temperature. Following the deposition of a seed layer by spin coating, an aqueous solution method was used to grow ZnO nanowires. This was followed by the self-assembly of an electrode array via dielectrophoresis prior to the fabrication of the CO sensing device. \pardThe material characteristics were analyzed using FE-SEM, EDS, GIXRD, FE-TEM, and the measurement of photoluminescence (PL). Our results identified the ZnO nanowires as a single crystalline wurtzite structure. Extending the growth period from 30 min to 360 min led to an increase in the length and diameter of the nanowires. After two hours, the ZnO presented a preferred crystal orientation of [002]. Sensor chips were assembled using 60 pairs of electrodes with gaps of 2μm, over which were lain nanowires to complete the sensing devices. The average sensing response was 48.37 s and the average recovery time was 65.61 s, with a sensing response magnitude of approximately 6.8% at room temperature.

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