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Improving gas sensing by CdTe decoration of individual Aerographite microtubes

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Abstract

Novel gas sensors have been realized by decorating clusters of tubular Aerographite with CdTe using magnetron sputtering techniques. Subsequently, individual microtubes were separated and electrically contacted on a SiO₂/Si substrate with pre-patterned electrodes. Cathodoluminescence, electron microscopy and electrical characterization prove the successful formation of a polycrystalline CdTe thin film on Aerographite enabling an excellent gas response to ammonia. Furthermore, the dynamical response to ammonia exposure has been investigated, highlighting the quick response and recovery times of the sensor, which is highly beneficial for extremely short on/off cycles. Therefore, this gas sensor reveals a large potential for cheap, highly selective, reliable and low-power gas sensors, which are especially important for hazardous gases such as ammonia.