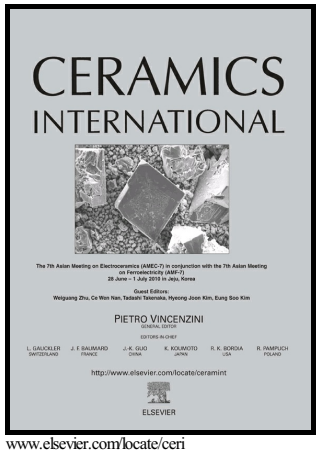

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Incorporation of carbon nanotube and graphene in ZnO nanorods-based hydrogen gas sensor

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Abstract

In this study, ZnO nanorods (NRs) were grown using solgel/hydrothermal methods on SiO_2, carbon nanotube (CNT)/SiO_2, and graphene/SiO_2 substrates to form hydrogen gas sensing chips. Results indicate that ZnO NRs/CNT/SiO_2 structures exhibited better H_2 sensing performance than the other two types of ZnO NRs-based structures. Furthermore, multiple electrical and material characterizations show that ZnO NRs/CNT/SiO_2 structures had a stronger (002) crystalline phase, with nanorod fusion near the bottom, and more oxygen-related defects. Owing to their small size, simple fabrication, and low cost, the ZnO NRs/CNT/SiO_2based H_2 gas sensors are promising for future industrial H_2 sensing applications.