

Solution-processed ZnO-chemically converted graphene gas sensor

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In the past decade, one-dimensional (1-D) nanostructure such as carbon nanotubes, ZnO nanowires (NWs) or nanorods (NRs) have attracted much attention in sensor device applications. Recently, two-dimensional (2-D) graphene has emerged as high potential material and increasingly attracted attention owing to its fascinating physical properties. Future studies require a building block of multifunctional materials as well as structures, because it enables us to exploit versatile and tailor-made properties with performances far beyond those of the individual materials and also opens the door to a wide range of possible applications. In this regard, attempts have been made to integrate 1-D ZnO NRs with 2-D graphene to synthesize the novel material structure for investigating its optoelectrical properties and its application in gas sensor devices. In this work, we present a straightforward solution-based method to prepare a gas sensor device from ZnO NRs vertically grown on chemically converted graphene (CCG) thin film that increases the density of vertically aligned ZnO NRs with preferred orientation along the (002) plane.