Fabrication and characterization of n-ZnO nanorods/p+ -TiO2 heterojunction devices

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Trivalent/bivalent metal ions doped p+ -TiO2 were prepared wet-chemically and the solution was deposited on indium tin oxide (ITO) coated glass substrates by spin coating method. Vertically aligned n-ZnO nanorods were grown on p+ -TiO2/ITO/glass substrates by a seed layer assisted growth technique. Current(I)-voltage(V) characteristics for the Ag/n-ZnO nanorod/p+ -TiO2/ITO assembly showed rectifying behaviour with relatively small turn-on (V0) voltages. The effect of thickness and morphologies of n-ZnO and the composition of p+ -TiO2 thin films on the electrical properties were studied. X-ray photoelectron spectroscopy (XPS) confirmed Ti4+ oxidation state of the Ti2p band in the doped p+ -TiO2.