Nitrogen Dioxide Gas Sensor of In2O3-ZnO Polyhedron Nanostructures Prepared by Spray Pyrolysis

Heterostructure thin films of indium and zinc oxides (IZO) were prepared by spray pyrolysis from an aqueous solution of the precursors at different substrate temperatures (T S). The polycrystalline structure of bixbyite appeared at a low temperature. The crystallinity was enhanced with the emergence of the zinc oxide phase. By increasing the T S to 623 K, the crystallite size was increased. SEM images reveal that the deposited sample at 523 K is composed of irregularly shaped nanoparticles with a lack of links. Increasing the T S to 573 K increases the average particle diameters, and the particles appeared as polyhedrons well connected with cavities between them, which candidates for gas sensing applications. Increasing T S to 623 K resulted in the particles merging. NO 2 gas sensor results confirmed the enhancement of IZO sensitivity performance at 573 K. Keywords: Gas sensor, thin film metal oxide, spray …