The influence of tin doping on the structural & morphology features of indium oxide

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Indium oxide (In_2O_3), a wide band gap (~ 3.6 eV) transparent conducting oxide is of great interest. Its unusual combination of high transparency in the visible range and high electrical conductivity (free carriers up to 10^{17} to 10^{19} cm^{-3}) gives it wide device applicability [1-3]. Various methods have been reported for the synthesis of In_2O_3 nanostructures. However, we have employed a catalyst and surfactant free approach for the synthesis of indium-tin oxide nanostructures at very low temperature. The approach is based on a simple reaction of ITO powder and de-ionized water at 190°C . The synthesized samples were characterized by Powder X-ray diffraction technique and Scanning electron microscopy (SEM) to study the structural and the morphological features. Figure 1 and Figure 2 show the SEM images of the ITO nanostructures. Further, the reported method besides being catalyst free is economical, fast and environmental friendly, which will make it suitable for large-scale production.

Figure 1: SEM image of ITO nanostructures

Figure 2: Magnified SEM image ITO nanostructures

Keywords: soft synthesis; spherical nanoparticles; formation mechanism

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