

# Influence of gas carrier on morphological and optical properties of nanostructured In<sub>2</sub>O<sub>3</sub> grown by solid-vapour process

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## Abstract

Nanostructured indium oxide (In<sub>2</sub>O<sub>3</sub>) thin film was prepared by solid-vapour deposition method under NH<sub>3</sub> and Ar atmosphere. The influence of gas nature on the growth of In<sub>2</sub>O<sub>3</sub> thin film was investigated in terms of structure, morphology and optical properties. X-ray diffraction, Raman spectroscopy and photoluminescence analyses indicated the formation of pure In<sub>2</sub>O<sub>3</sub> phase with strong preferred orientation along c-axis, from cubic- to needles-like morphologies. The as-fabricated nanostructured In<sub>2</sub>O<sub>3</sub> thin films with tailored morphology, enhanced crystallinity and optical quality can be used for gas sensing, solar cells and other potential applications. In addition, the potential use of NH<sub>3</sub> as carrier gas for an efficient control of morphology/size and optical properties can be proposed for the fabrication of other nanostructured oxides.