



# Characterization of core/shell structures based on CdTe and GaAs nanocrystalline layers deposited on SnO<sub>2</sub> microwires

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<https://doi.org/10.1016/j.spmi.2018.01.034>

## Abstract

We report the fabrication and characterization of SnO<sub>2</sub>/CdTe and SnO<sub>2</sub>/GaAs core/shell microstructures. CdTe or GaAs shell layers were deposited by radio-frequency (RF) magnetron sputtering on core SnO<sub>2</sub> microwires synthesized by a flame-based thermal oxidation method. The produced structures were characterized by scanning electron microscopy (SEM), high-resolution scanning transmission electron microscope (HR-STEM), X-ray diffraction (XRD), Raman scattering and FTIR spectroscopy. It was found that the SnO<sub>2</sub> core is of the rutile type, while the shells are composed of CdTe or GaAs nanocrystallites of zincblende structure with the dimensions of crystallites in the range of 10–20 nm. The Raman scattering investigations demonstrated that the quality of the porous nanostructured shell is improved by annealing at temperatures of 420–450 °C. The prospects of implementing these microstructures in intrinsic type fiber optic sensors are discussed.