Fabrication of high-performance fluorine doped–tin oxide film using flame-assisted spray deposition

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Abstract

A high-performance fluorine–doped tin oxide (FTO) film was fabricated by flame-assisted spray deposition method. By varying the NH4F doping concentration, the optimal concentration was established as 8 at.%. X-ray diffractograms confirmed that the as-grown FTO film was tetragonal SnO2. In addition, the FTO film was comprised of nano-sized grains ranging from 40 to 50 nm. The heat-treated FTO film exhibited a sheet resistance of 21.8 Ω/ with an average transmittance of 81.9% in the visible region (λ = 400–800 nm). The figures of merit shows that the prepared FTO film can be used for highly efficient dye-sensitized solar cells electrodes.

Keywords

Fluorine–doped tin oxide; Flame-assisted spray deposition; Atmospheric pressure; Transparent conductive oxide; Sheet resistance; X-ray diffraction

Figures and tables from this article:

Fig. 1. Schematic diagram of the FASD method.