



## Thin Solid Films

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## 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  $\text{NH}_4\text{F}$  doping concentration, the optimal concentration was established as 8 at.%. X-ray diffractograms confirmed that the as-grown FTO film was tetragonal  $\text{SnO}_2$ . 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  $21.8 \Omega/\square$  with an average transmittance of 81.9% in the visible region ( $\lambda = 400\text{--}800 \text{ nm}$ ). 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:

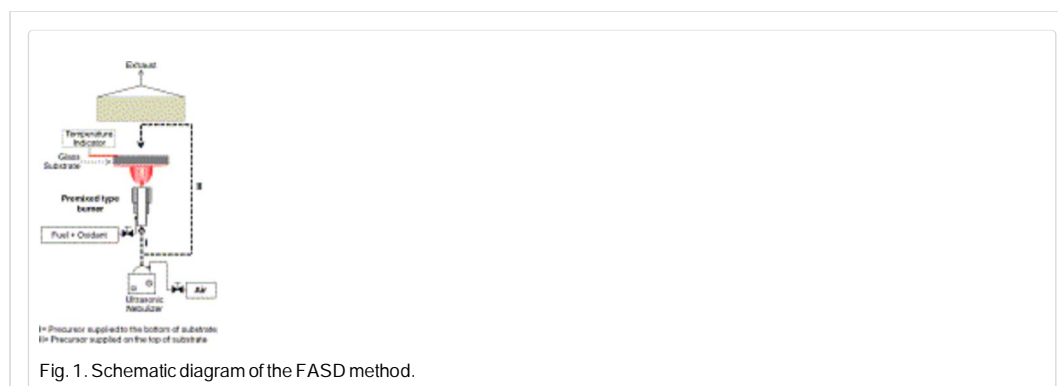


Fig. 1. Schematic diagram of the FASD method.