



Thin Solid Films

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

Agus Purwanto^a,  , Hendri Widiyandari^b, Arif Jumari^a

^a Department of Chemical Engineering, Faculty of Engineering, Sebelas Maret University, Jl. Ir. Sutami 36 A, Surakarta, Central Java 57126, Indonesia

^b Department of Physics, Faculty of Mathematics and Natural Sciences, Diponegoro University, Jl. Prof. Dr. Soedarto, Tembalang, Semarang 50275, Indonesia

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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 NH_4F doping concentration, the optimal concentration was established as 8 at.%. X-ray diffractograms confirmed that the as-grown FTO film was tetragonal 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:

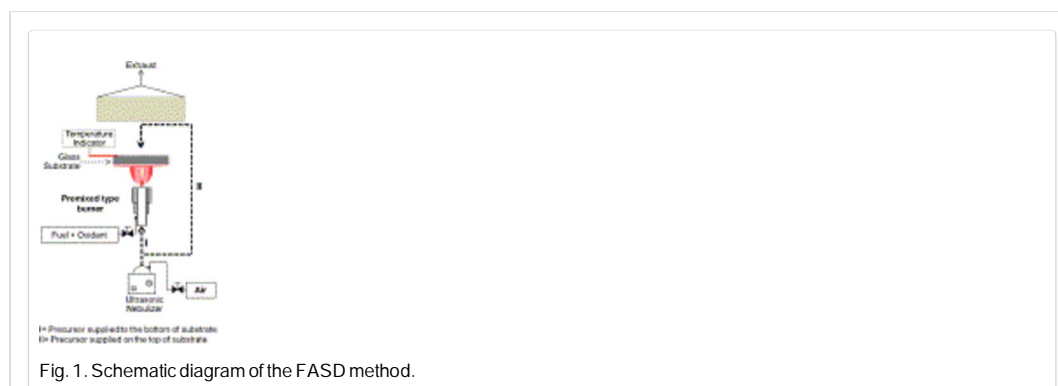


Fig. 1. Schematic diagram of the FASD method.