

Thesis Title	Preparation of Fluorine Doped Tin Oxide Thin Films by Pyrosol Technique
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ABSTRACT

Transparent conducting oxide (TCO) films have been prepared by having fluorine doped tin oxide deposited on soda-lime microscope glass slides. using spray pyrolysis at the temperature of 430 °C by low cost pyrosol system. Precursor solution was atomized by ultrasonic mist generator. The solution was a mixture of $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$, NH_4F , RO water, ethanol and HCl. The morphology of the surface electrical and optical properties of these films were studied by varying the fluorine concentration, gas flow rate and the spraying time. The optimum grain size and film thickness were found at 160 nm and 960 nm respectively. The best electro-optic were obtained with resistivity(ρ) as low as $1.88 \times 10^{-3} \Omega\text{-cm}$, sheet resistance (R_{sh}) as low as $19 \Omega/\square$, mobility (μ) at $9 \text{ cm}^2/\text{v}\cdot\text{s}$ and carrier concentration (n) at $3.7 \times 10^{20} \text{ cm}^{-3}$. The best percent transmission was at 70 - 90 in the visible region by 40 % area efficiency at the condition fluorine concentration of 1.0 M with the gas flow rate of 1.4 L/m and the spraying time of 15 minutes.