

PREPARATION OF HIGHLY TRANSPARENT CONDUCTING FLUORINE DOPED TIN OXIDE GLASS

K. I. I. B. Kulathunga

Postgraduate Institute of Science

University of Peradeniya

Peradeniya

Sri Lanka

Fluorine doped tin oxide glass (FTO) has been prepared from ammonium fluoride and stannous chloride by hand spray pyrolysis deposition method. Resistance and optical transmittance of fluorine doped tin oxide glasses have been investigated.

The optimum NH_4F wt. % for fluorine doping, to obtain the minimum resistance for fluorine doped tin oxide glass was determined by varying the amount of ammonium fluoride added to stannous chloride solution. The substrate temperature and the volume of the solution sprayed were varied to optimize the electrical and optical properties of the FTO glass.

The optimum NH_4F wt. % for fluorine doping was observed at approximately 11 wt. % of ammonium fluoride doping. The lowest resistance was observed for glass plates (FTO glass C_{120}) sprayed with 120 ml of 0.106 M stannous chloride solution containing 0.36 g of ammonium fluoride, corresponding to at 11 wt. % of ammonium fluoride doping.

For FTO glass C_{120} , average resistance of 63.6Ω was observed. Transmittance values of 78.8%, 83.6% and 87.8% were observed, respectively, at wavelengths of 459.5 nm, 554.0 nm and 715.0 nm, in the visible region. Accordingly, in the visible range, FTO glass C_{120} has better optical transmittance than commercially available FTO glass.