# The influence of deposition time and substrate temperature during the spray pyrolysis process on the electrical resistivity and optical transmittance of 2 wt% fluorine-doped tin oxide conducting glass

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Abstrak

Transparent conducting oxide (TCO) glasses play an important role in various technology, including dye sensitized solar cells. One of the most commonly used glass is indium tin oxide (ITO) glass, which is expensive. Therefore, the main purpose of this research was to determine if ITO glass can be replaced with fluorine-doped tin oxide (FTO) glass, which is easier and more economic to manufacture. For this purpose, a tin chloride dehydrate (SnCl2.2H2O) precursor was doped with ammonium fluoride (NH4F) using a sol-gel method and spray pyrolysis technique to investigate the fabrication process for conductive glass. NH4F was doped at a ratio of 2 wt% in the SnCl2.2H2O precursor at varying deposition times (10, 20, and 30 minutes) and substrate temperatures (250, 300, and 350°C). The results revealed that longer deposition times created thicker glass layers with reduced electrical resistivity. The highest optical transmittance was 75.5% and the lowest resistivity was 3.32´10-5 Ω.cm, obtained from FTO glass subjected to a 20-minute deposition time at deposition temperature of 300oC.