

## **FTIR and AFM Properties of Doubly Doped Tin Oxide Thin Films Prepared by Spin Coating Technique**

**Authors :** Bahattin Duzgun, Adem Kocyigit, Demet Tatar, Ahmet Battal

**Abstract :** Tin oxide thin films are semiconductor materials highly transparent and with high mechanical and chemical stability, except for their interactions with oxygen atoms at high temperature. Many dopants, such as antimony (Sb), arsenic (As), fluorine (F), indium (In), molybdenum and (Mo) etc. have been used to improve the electrical properties of tin oxide films. Among these, Sb and F are found to be the most commonly used dopants for solar cell layers. Also Tin oxide thin films investigated and characterized by researchers different film deposition and analysis method. In this study, tin oxide thin films are deposited on glass substrate by spin coating technique and characterized by FTIR and AFM. FTIR spectroscopy revealed that all films have O-Sn-O and Sn-OH vibration bonds not changing with layer effect. AFM analysis indicates that all films are homogeneity and uniform. It can be seen that all films have needle shape structure in their surfaces. Uniformity and homogeneity of the films generally increased for increasing layers. The results found in present study showed that doubly doped SnO<sub>2</sub> thin films is a good candidate for solar cells and other optoelectronic and technological applications.

**Keywords :** doubly doped, spin coating, FTIR analysis, AFM analysis

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