

Characteristics of Transparent Conductive Tin Oxide Thin Films on PET Substrate Prepared by ECR-MOCVD

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SnO₂ films were prepared at room temperature under a (CH₃)₄Sn-H₂-O₂ atmosphere in order to obtain transparent conductive polymer by using ECR-MOCVD (Electron Cyclotron resonance-Metal Organic Chemical Vapor Deposition) system. The electrical properties of the films were related to the process parameters such as deposition time, microwave power, magnetic current power, magnet/showering/substrate distance and working pressure. The increase in microwave power and magnetic current power brought on SnO₂ film formation with low electric resistivity. On the other hand, the effects of process parameters described above on optical properties were insignificant in the range of our experimental scope. The transmittance and reflectance of the films prepared by ECR-MOCVD exhibited their average values of 93-98% at wave length range of 380-780nm and 0.1-0.5%, respectively. The grain size of the SnO₂ films that are also insensitive with the process parameters were in the range of 20-50nm. On the basis of experimental data obtained in the present study, electrical resistivity of 7.5×10^{-3} ohm·cm, transmittance of 93%, reflectance of 0.2% can be taken as optimum.