

SELECTED TOPICS IN ADVANCED ELECTRONICS

Edited by
Khalid A. S. Al-Khateeb



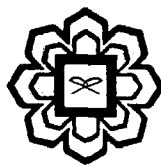
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ADVANCED ELECTRONICS

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TRANSPARENT ELECTRODES FOR OPTOELECTRONIC DISPLAYS

By

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Synopsis

Transparent electrodes are of major importance in a variety of modern applications such as visual display panels, flat TV screens, computer monitors, electro-optic devices and solar cell panels, just to name a few. One of the most common materials that have proved to be highly successful over the last few decades is Indium doped Tin Oxide ($\text{In}:\text{SnO}_2$ or ITO). The preparation methods and the performance characteristics of ITO are not very complicated. The conduction mechanism and transport phenomena are interpreted in terms of charge carrier hopping amongst traps within the band gap of the lattice.

Nowadays there are many other less common materials, which are still under investigation. Much of the ongoing investigation effort is concerned with Carbon nano tubes. These new materials have raised much interest due to their outstanding mechanical properties. Now, they have also exhibited some interesting electrical properties of transparency and conductivity, which makes them suitable materials as transparent electrodes.

Some polymer materials with relatively high conductivity and good transparency stand as viable contenders for transparent electrode applications

1. Introduction

It may be possible to use plate electrodes in electro-optic effect measurements exhibited by large bulk crystals such as ADP or LiNbO_3 . In the longitudinal configuration, where the applied field is parallel with the direction of propagation of a