

Low Temperature Preparation of Zinc Oxide and Indium Tin Oxide Thin Films with Durable Electro-Optical Performance Using Molecular Precursors

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The successful synergy of low resistivity and high visible transmittance allows transparent conductive oxides (TCOs) thin films to be very promising key materials for many applications such as transparent electrodes for flat panel displays and photovoltaic cells, low emissivity windows, window defrosters, transparent thin films transistors, light emitting diodes, and semiconductor lasers.^[1]

The ultimate aim in the optoelectronic industry is the reduction of the material costs and sustainment of a high efficiency potential. The selection of the appropriate material and method of preparation is generally made by maximizing the performance of the TCO system by considering all relevant parameters, and minimizing the expenses. TCOs can be prepared easily by depositing a TCO film on a substrate, which avoids using complicated wet chemical processing and high temperature treatment steps, and reduces considerably the number of processes required.^[2]

Here we report a simple low-temperature, solution-based successful approach for the preparation of *tin-rich* indium tin oxide and zinc oxide transparent semiconductive thin films-based field effect transistors and their fascinating optoelectronic properties using organometallic precursors.^[3]

[1] J. van Boort, R. Groth, *Philips. Tech. Rev.* **1968**, 29 (1), 17.

[2] I. Kikuchi, K. Ozawa, *Electr. Ceram.* **1985**, 5, 23.

[3] a) Y. Aksu, M. Driess, T. Lühge, R. Fügemann, M. Inhester *International Patent WO-2008/113632 A1*; b) Y. Aksu, S. Schutte, M. Driess, H. Thiem, D.-V. Pham, A. Merkulov, J. Steigers *International Patent WO-2010/057770 A2*.