

New Low-Cost Materials for Electronic Device Displays

ID# 2013-4154



Applications for TCF Materials

Technology Summary

The disclosed invention is a novel strategy for creating transparent conducting film (TCF) materials, which allows for tunability of conductance and transparency based on relevant physical parameters, carrier concentration, free carrier mass and thickness of the material. The class of materials possesses short electron mean free paths and more favorable sheet resistance dependence on film thickness; high electrical conductivity through metal-like carrier concentrations; and high transparency in VIS-IR range and deep-UV range. The reduced thickness increases the high volume throughput, mass production and down-scaling of feature sizes. The invention's reliable, reproducible method of manufacturing is compatible with existing large volume production and low cost equipment.

Application & Market Utility

This class of material can potentially replace indium tin oxide (ITO) as transparent conducting thin film. ITO is the mainstream transparent conductor currently dominating the market. The indium price has rapidly increased in recent years due to its limited natural abundance and increased demands from the display industry. The invention's class of chemically inert materials is also low toxicity compared to current ITO.

Next Steps

Patent 10,311,992 issued 6/4/2019. Seeking licensing and commercialization.

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Investment | Licensing | Research

Keywords

- transparent conductors
- smart glass
- photovoltaics
- metallic thin films
- light emitting diodes (LED)

Researchers

Roman Engel-Herbert

Associate Professor of Materials Science, Engineering, and Physics

[Online Bio](#)

Lei Zhang

Postdoctoral Researcher, Conversion and Small Molecule Group

[Website](#)

Originating College

College of Engineering

Office of Technology Management Contact

Smith, Matthew
mds126@psu.edu
814-863-1122



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