

## **Metallic nanowire composites for flexible electronics applications**

P. Swaminathan

Associate Professor,

Dept. of Metallurgical and Materials Engineering, IIT Madras

Chennai – 600036, Tamil Nadu, India

Indium tin oxide (ITO) is the current material of choice for transparent electrode applications. Various factors, including the high cost of indium, drive the search for ITO replacements. For flexible electronics, such replacements should also be elastic and possess good adhesion to the substrate, which rules out most of the oxide based transparent conducting (TC) materials. Recently, metallic (specifically silver) nanowire (NW) based TC electrodes are being increasingly investigated. There are ongoing attempts to synthesize and planarize these NW electrodes by a variety of research groups around the world.

This talk will be divided into two parts. In the first part, I'll describe a template assisted chemical reduction method to synthesize metallic NWs. The process allows us to synthesize NWs of a variety of metals, with controllable length and diameter. In the second part, I'll describe the synthesis of a printable silver NW based composite ink, by dispersing the NWs in a conducting polymer, such as PEDOT: PSS. The composite ink can be printed on flexible substrates, such as PET, and possess good transparency, conductivity, flexibility, and substrate adhesion. Some applications of this printed TC composite electrode will be described.