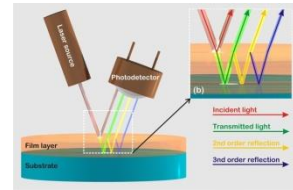


## ThetaMetrisis APPLICATION NOTE #042

### Thickness calculation of conductive polymer layers



#### Introduction:

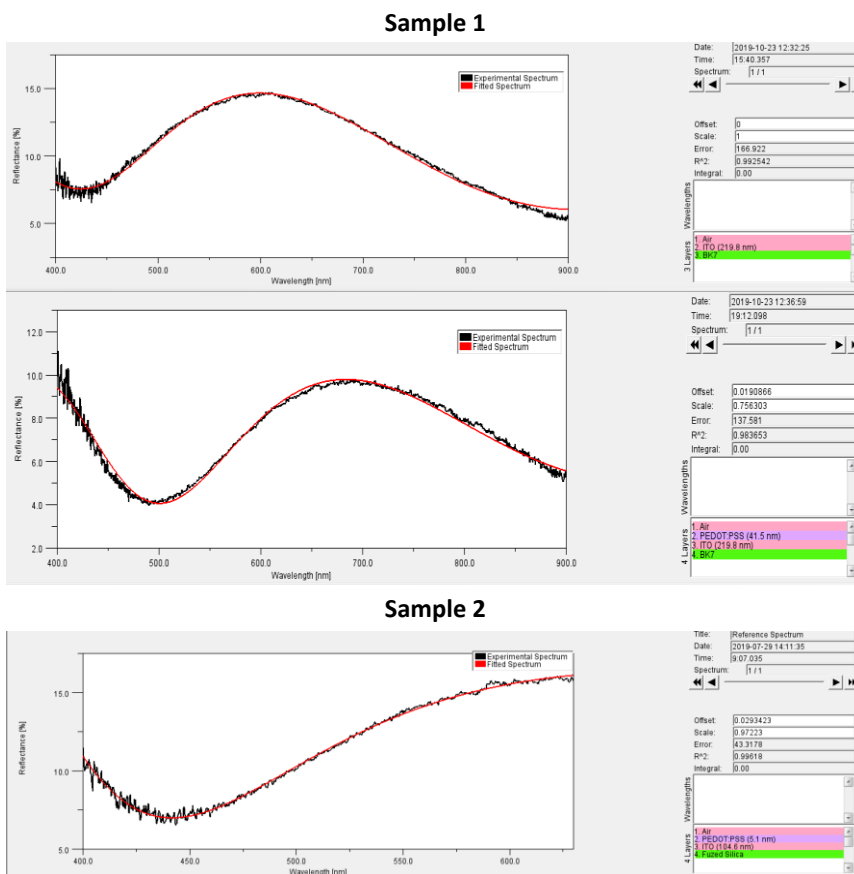
**Conductive polymers** are materials with good electronic and ionic conductivity. Those polymers are inexpensive, easy to synthesize and they have good environmental stability. Due to their properties (mechanical, optical and electronic properties) they can be used in a wide range of applications such as electronic devices, chemical sensors, biosensors, OLED's, transistors, diodes etc. In this application note, a **ThetaMetrisis FR-pRo** tool is used for the characterization of a **PEDOT:PSS layer on top of ITO**.

#### Means & Methods:

Samples under investigation were two transparent substrates (BK7 and fused silica) coated with ITO (of different thicknesses) and with **PEDOT:PSS applied on top**. Reflectance measurements were performed by using an **FR-pRo VIS/NIR** tool operating in the **370nm-1020nm** spectral range.

#### Results:

Typical experimental reflectance spectra (black line) and fitted reflectance spectra (red line), as recorded by the FR-Monitor software, and the thickness values measured, are illustrated in the figures below. In Sample-1 (first two figures) both the measurements of ITO and PEDOT:PSS on BK7 are illustrated. In Sample-2 (last figure) the measurement of PEDOT:PSS deposited on ITO on fused silica is demonstrated.



#### Thickness measured

ITO measured at **219.8nm**

ITO measured at **219.8nm**

PEDOT:PSS measured at **41.5nm**

#### Thickness measured

ITO measured at **104.6nm**

PEDOT:PSS measured at **5.1nm**

**Conclusions:** FR-pRo VIS/NIR tool was successfully used for the thickness calculation of conductive polymer films on transparent substrates with ITO.