# Inkjet-printed organic electronics: Traps, operational stability and reliability issues

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Organic printed circuits fabricated on bendable substrates have great potential for novel applications in consumer electronics such as smart labels intelligent textiles. However, organic thin-film transistors (TFTs), still suffer from a number of non-ideal properties. Among these, are the so-called “contact effects”, which limit the carrier injection under high drain-source current demand, the threshold voltages shift and the anomalous increase in the off-current. All these effects are caused by the presence of impurities. Mapping the defects responsible for this behavior is crucial to identify their chemical origin and devise ways to eliminate them. In this contribution we use Thermal Stimulated Currents (TSC) to measure the signature of a number of deep traps located at printed semiconductor/dielectric interface.

Several dielectric/semiconductor interfaces were studied. The active TFT channel was fabricated using a small molecular semiconductor (FS 0013) provided by FlexInk. For the dielectric layer, several materials were assessed including, non-cross-linked polyvinylpyrrolidone (PVP), and solgel EMD6415 provided by SunChemical

In this contribution, we also propose a methodology to obtain a figure of merit for operational stability. We show that by measuring threshold voltage ($V_{th}$) required to accommodate a constant current, it is possible to obtain parameters that allows us to quantify the vulnerability of the TFT to changes in threshold voltages under continuous operation.