

# Electrical Characterization of p-n Junctions and Field Effect Transistors based on Dithienylacrylic Acid Complexes

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A new type of solution-processible self-assembled materials, dithienylacrylic acid complexes, has been synthesized and evaluated in electronic devices. It is believed that these complexes prefer a disk-shaped configuration that facilitates the formation of highly ordered films, thus enhancing the charge-carrier mobilities.

In this work we studied three of these materials, deposited by spin-coating. They were used in field-effect transistors (FETs), pn-junctions with silicon and Schottky barriers with aluminum. The pn-junctions and Schottky barriers show excellent rectification ratios (10000 at  $\pm 0.5$  V) and can be used to determine trap levels and doping concentrations by means of impedance spectroscopy and capacitance-voltage measurements, while from the IV curves of the FETs we are able to determine the mobilities of the free carriers.