

# Electrical and Optical Properties of PTCDI-C13 for Photovoltaic Applications

J. Puigdollers,

M. Della Pirriera, C. Voz, S. Cheylan, R. Alcubilla  
Grup of Micro i Nanotecnologia. Universitat Politècnica Catalunya  
Barcelona (Spain)

The organic photovoltaic technology has developed much in the last few years thanks to the optimization of the solar cell geometry and, specially, to the research for new performing materials. Nevertheless, much work has still to be done in order to better know the real mechanisms regulating the function of such novel class of semiconductors. The study of thin-film micro-structure, and the influence of the deposition parameters on it, is an important issue in order to obtain best optical and electrical properties. Thermal evaporation in high-vacuum chambers is one of the more suitable deposition technique to obtain organic thin-films with well organize molecular structure. Deposition parameters such as the substrate temperature and deposition rate may have some important effect on the molecules ordering. In this paper the effects of substrate temperature on structural and optical properties have been studied for *N,N'*-ditridecyl perylene diimide (PTCDI-C<sub>13</sub>) thin-films. Different samples deposited at 30, 60, 90 and 120°C substrate temperature and their absorption has been investigated by photothermal deflection spectroscopy (PDS) and transmittance spectroscopy. Moreover, thin-film transistors have been fabricated. The electrical (mobility) properties of the films have been correlated with the structural properties obtained by Atomic Force Microscopy (AFM).