Organic Electronic Research Group
Bordeaux, France

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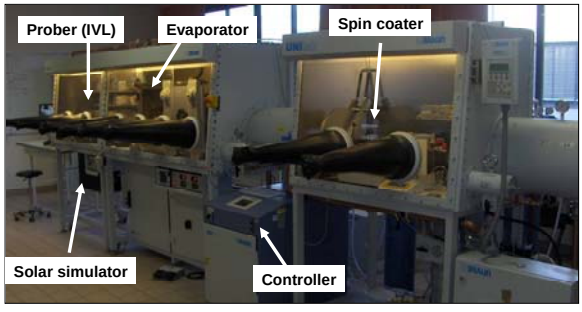
In Bordeaux (France), the Integration from Materials to Systems (IMS) Laboratory has developed a technological centre, (the ELORGA platform), dedicated to the research around organic semiconductors. Several topics are developed dealing with various electronic devices such as:

- Organic Light Emitting Diodes (OLEDs)
- Organic Field-Effect Transistors (OFETs)
- Organic Photovoltaic Cells (OPV) and dye sensitised solar cells

Both semiconducting polymers and small molecules are studied. Commercially available semiconductors are used to study and develop devices understanding and architecture. Novel materials from various chemistry labs are also commonly evaluated using the ELORGA platform.

Technological facilities consist in an all-integrated system for the manufacturing and characterization under inert atmosphere of organic-based devices. Glove-boxes are equipped with multiple spin-coaters, vacuum evaporation chambers for the deposition of electrodes and of low molecular weight compounds with temperature controlled crucibles and extensive advanced customized set-up. Large area solar cells are also addressed and manufactured by *Doctor Blading* or *Rell-to-Rell* techniques. Characterizations of devices can be performed either under inert atmosphere or not. Electrical measurements are carried-out with multiple instruments including sourcemeters, semiconductor analyser and other specific equipments. An AM1.5 solar simulator is used for OPV cells characterisation. Prior to measurements, our illumination system is carefully calibrated with an *IL 1400* radiometer which has been cross-calibrated with other research groups. A multiplexed lifetime analysis system is also available to study the stability and degradation mechanisms of OPV devices. Spectroscopy equipments are used to characterize organic thin films (UV-Vis and fluorescence). Incident Photon-to-electron Conversion Efficiency (IPCE) set-up is also available. Devices are also investigated through temperature dependent electro-optical measurement in cryostatic chambers [1,2]. Our group has access to AFM, SEM, EDX and advanced nuclear analysis (RBS and PIXE).

In the OPV field, our strategy is to develop high efficiency solid-state organic solar cells with improved stability to be applied on large area products through several guidelines: the use of novel materials [3,4], the use of self-assembled donor-acceptor molecules, the use of block-copolymers or the study of cross-linkable semiconductors [5]. To this goal, our group has multiple collaborations with chemists and is very open to start new projects with scientists.



[1] Wantz *et al.* ***Appl. Phys. Lett.*** *90* (2007) 162104
[2] Huby *et al.* ***Phys. Rev. B*** *75* (2007) 115416
[3] Wantz *et al.* ***Sol. Energy Mater. Sol. Cells*** (2008), doi :10.1016/j.solmat.2007.12.06
[4] Urien *et al.* ***Polym. Int.*** (2007) doi:10.1002/pi.2407 ; Urien *et al.* ***Org. Electron***. 8 (2007) 727-734
[5] Dautel *et al.* ***J. Am. Chem. Soc.***, 128(14) (2006) 4892-4901.