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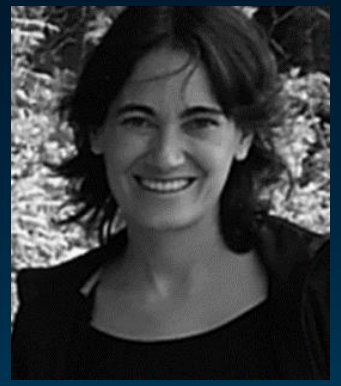

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BACKGROUND

I carried out my PhD at the Institute of Materials Science of Barcelona (ICMAB-CSIC) and at the at The Royal Institution (Ri) of Great Britain, and my postdoc at the Physics Department of the Kavli Nanoscience Institute of the Delft University of Technology.

Currently, I am leading a small research group at ICMAB-CSIC focused on the integration of organic molecules into more advanced electronic devices, at the molecular level, and also in large-area devices, especially in organic field-effect transistors (OFETs).

Our work ranges from fundamental studies in order to better understand materials properties to a more applied perspective aiming at developing proof-of-principle devices. Particularly, our areas of interest include synthesis of novel functional molecules, surface self-assembly, crystal engineering, molecular switches, OFETs and electrolyte-gated field-effect transistors (EGOFETs), charge transport and organic-based (bio)-sensors.

High performing organic field-effect transistors for sensing applications

Abstract

The development of organic electronics has been the subject of important research efforts over the past few years, yielding electronic devices with performances comparable or even surpassing that of amorphous silicon. One of the main advantages of organic materials is their solution-processability and, consequently, their low temperature manufacturing. This offers the possibility to fabricate low-cost and flexible devices, which are also suitable for large area applications.
Printing organic small molecule semiconductors (OSCs) with high throughput techniques for the fabrication of highly performing organic field-effect transistors (OFETs) is currently of major technological interest. However, some challenging issues remain unsolved in order to implement these devices in real applications, such as reproducibility and long-term stability. Recently, we have shown that the deposition of blends of OSCs with polymers by Bar-Assisted Meniscus Shearing (BAMS) gives rise to highly crystalline films. In addition, the control of the deposition parameters (coating speed and temperature) as well as the modification of the ink formulation can be used as tools to tune the thin films morphology and polymorphism and to optimise, thus, the device performance. The devices fabricated with this methodology have been applied for the development of X-ray detectors, biosensors and for recording the activity of cells.