EUROPEAN **S**YNCHROTRON **R**ADIATION **F**ACILITY

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ESRF

ESRF	**Experiment title:** Polymer optoelectronic devices based on P3HT:F8BT miscible blends	**Experiment number**: MA-3039
Beamline:	**Date of experiment**: from: 05.04.2016 to: 08.04.2016	**Date of report**: Feb 2017
Shifts:	**Local contact(s)**:	*Received at ESRF:*

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Report:

During our beam sesion at the BM26 beamline we performed the characterization of spin coated and nanostructured thin films of different conjugated conducting polymers including PFO, P3HT, F8BT and its blends.

Figure 1 shows the 2D x-ray patterns obtained in GIWAXS configuration of the setup. It is possible to observe a direct influence of the film thickness, annealing protocol or processing conditions under high pressure on the structural properties of the different materials. Results allow to confirm the presence of characteristic lamellar or π-π stackings.

Some of the samples were nanostructured by means of nanoimprinting lithography using PDMS molds. The characterization of the ordered nanostructures generated by NIL was studied by means of grazing Incidence Small Angle X-ray Scattering. Figure 2 shows the pattern obtained from a nanostructure PMMA thin film surface consisting on a pillar array with hexagonal symmetry.

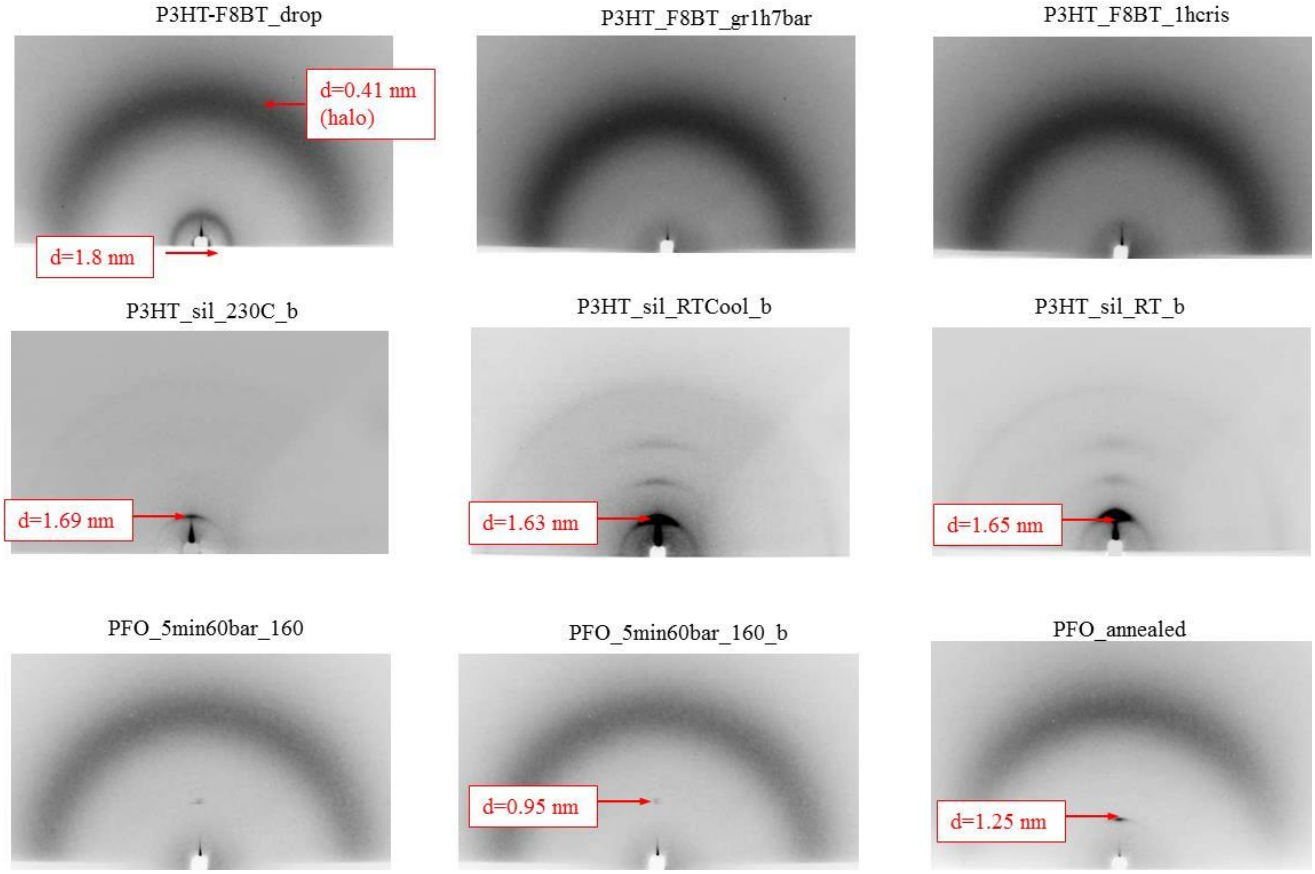

Figure 1. 2D GIWAXS patterns showing the influence of processing conditions on the structure of thin films prepared from different conducting polymers

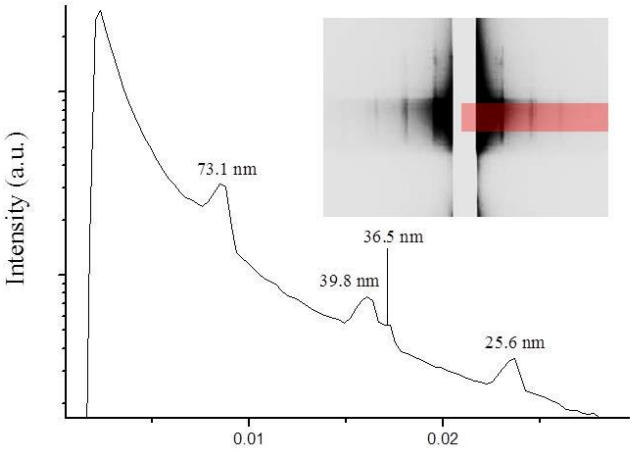

Figure 2. Grazing Incidence Small Angle X-ray Scattering (GISAXS) pattern acquired at an incidence angle $\alpha_i = 0.4°$ for a nanostructured surface consisting on a hexagonal array of nanopillars