EUROPEAN SYNCHROTRON RADIATION FACILITY

INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

ESRF

Experiment Report Form

The double page inside this form is to be filled in by all users or groups of users who have had access to beam time for measurements at the ESRF.

Once completed, the report should be submitted electronically to the User Office using the **Electronic Report Submission Application:**

http://193.49.43.2:8080/smis/servlet/UserUtils?start

Reports supporting requests for additional beam time

Reports can now be submitted independently of new proposals – it is necessary simply to indicate the number of the report(s) supporting a new proposal on the proposal form.

The Review Committees reserve the right to reject new proposals from groups who have not reported on the use of beam time allocated previously.

Reports on experiments relating to long term projects

Proposers awarded beam time for a long term project are required to submit an interim report at the end of each year, irrespective of the number of shifts of beam time they have used.

Published papers

All users must give proper credit to ESRF staff members and proper mention to ESRF facilities which were essential for the results described in any ensuing publication. Further, they are obliged to send to the Joint ESRF/ ILL library the complete reference and the abstract of all papers appearing in print, and resulting from the use of the ESRF.

Should you wish to make more general comments on the experiment, please note them on the User Evaluation Form, and send both the Report and the Evaluation Form to the User Office.

Deadlines for submission of Experimental Reports

- 1st March for experiments carried out up until June of the previous year;
- 1st September for experiments carried out up until January of the same year.

Instructions for preparing your Report

- fill in a separate form for each project or series of measurements.
- type your report, in English.
- include the reference number of the proposal to which the report refers.
- make sure that the text, tables and figures fit into the space available.
- if your work is published or is in press, you may prefer to paste in the abstract, and add full reference details. If the abstract is in a language other than English, please include an English translation.

ESRF	**Experiment title:** Growth dynamics of organic-organic hetero-structures and structure formation at the organic-organic interface	**Experiment number:** 2340
Beamline: ID10B	**Date of experiment:** from: 05.12.07 to: 11.12.07	**Date of report:** 29.02.08
Shifts: 18	**Local contact(s):** F. Zontone	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):
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Report:

The experiments were performed along the lines of our proposal, focussing on *in situ and real time* growth studies of the organic molecules pentacene (PEN) and perfluoropentacene (PFP). Since the experiments were performed only two months ago and the data analysis is still in progress, we can only report the most important findings.

In situ and real time X-ray scattering provided information on the microscopic structure as well as the film morphology of PEN PFP heterostructures on SiO_2 substrates.

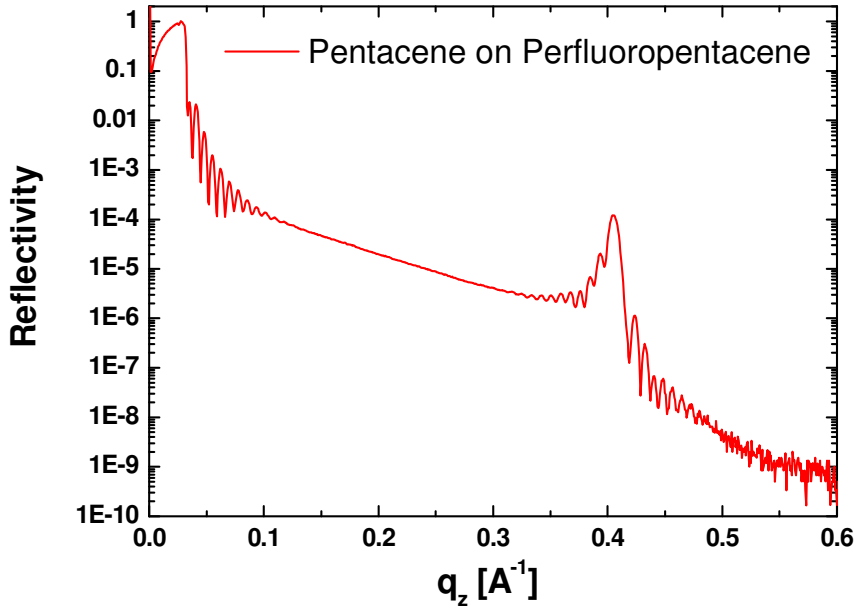

Fig. 1 Specular reflectivity of a thick pentacene layer (>50 nm) grown on a thin PFP layer, that worked as a template for the growth of PEN. The pronounced Laue- and Kiessig fringes shows, that even for thick films of PEN the roughness is strongly suppressed.

Very high structural order was found as can be seen from the scan of the specular reflectivity in Fig. 1. The Kiessig oscillations originate from a PEN layer evaporated on PFP and corresponds to the nominal thickness of both films. This indicates, that when evoporated on comperitively rough PFP, the PEN molecules fill the existing gaps and then grow with highly suppressed roughness. This very desireable growth behavior is possible, because the unit cell of PEN and PFP are similar and the strain at the interface is probably small.
Grazing incidence scans on the thin film phase of PEN on SiO_2 compared with data from a PEN-on-PFP heterostructure are shown in Fig. 2. Small shifts of the in-plane peaks of the two PEN films suggest that due to a templating effect the PEN unit cell is slightly changed.

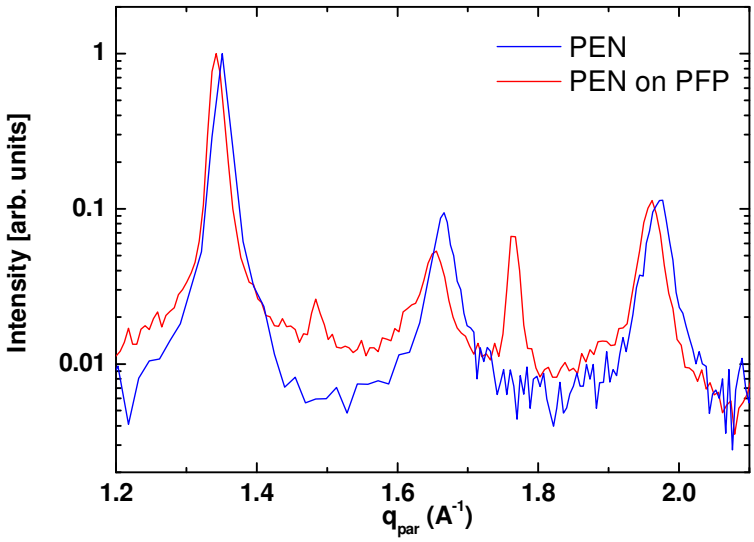

Fig. 2 Comparison of grazing incidence data from two different films. Blue: thin film phase of PEN deposited on SiO_2. Red: PEN deposited on a thin layer of PFP.

The taken data are promising and we expect to publish these interesting results soon.
We wish to acknowledge the excellent collaboration with the local contact Dr. F. Zontone which made this challenging experiment a success.