



	Experiment title: Induced substrate ordering of C60 on Pt(110) by GIXRD	Experiment number: SI-1672
Beamline:	Date of experiment: from: 10 June 2008 to: 17 June 2008	Date of report: 26/08/2008
Shifts:	Local contact(s): Dr Juan RUBIO-ZUAZO (e-mail: rubio@esrf.fr)	<i>Received at ESRF:</i>
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Report:

Recently, we performed a Surface X-ray Diffraction (SXRD) experiment on the system C60/Pt(110) on BM25b CRG beamline (SPLINE). The interest studying this system was centred on the Pt system due to their already demonstrated capabilities for magnetic purposes.

We performed during more than one year (since we submitted this proposal 2 times: the previous SI-1655 proposal was submitted on March 2007) a detailed characterization study by LEED and STM of adsorption on C60 molecules on the clean Pt(110)-(1x2) surface following the recommendations of the scientific committee of the ESRF. We demonstrated in the previous proposal that this system shows high 2D lateral order susceptible for being measured with X-rays. We even showed preliminary XRD measurements on that system.

In the experimental method section of proposal SI-1672 we propose to perform the experiment on beamlines BM32, ID03 or ID32. However, the ESRF assigned beamtime to perform this experiment at BM25b beamline. After knowing this assignation of beamline we contact the local contact to know the feasibility of the experiment in this beamline, since a quartz microbalance and Knudsen cell were necessary to perform the experiment. The users supply these components from their respective labs. However, some days before starting the experiment the local contact communicate us that the supplied balance quartz couldn't be mounted due to its wrong length. After knowing this fact and due to: i) the short period of time before starting the experiment (one week), ii) the large experience of the team preparing this surface and iii) the large range of substrate temperatures and deposition C60 rates tolerance for preparing this surface, the team decided to go on with the experiment.

After several preparation trials during the whole period of the experiment, it was impossible to achieve the good preparation conditions due to the following technical limitations:

- i) After playing with the deposition temperature of the source it was impossible to determine if some molecules were arriving to the surface. The absence (during the experiment) of an electron gun for Auger detection of carbon at the surface sample didn't permit to use the electron analyser system installed in the UHV chamber for the detection of carbon peaks. In principle, the high energy XPS mounted in the UHV chamber is not an useful system to detect the carbon signal due to the high energy difference between the X-rays and the emitted Auger electrons from carbon atoms. For this reason, this system could not be used to monitor the evolution of the carbon peak during the evaporation process of the C60 molecules.
- ii) In a similar way, the impossibility to mount the quartz microbalance in the system also avoided the calibration of the source.

Probably the users did a mistake (based on their experience characterizing this system) accepting to perform the experiment in this beamline in these technical conditions, however, we believe that the ESRF also have a part of responsibility since, the ESRF staff (from BM25B beamline) gave the technical viability to perform the experiment knowing the limitations of their UHV equipment.

The results of this procedure finished with an unsuccessful experiment. For this reason, we request to the scientific committee to properly evaluate this succession of errors for assigning a new period of beamtime to perform again this experiment.