



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.



	Experiment title: Structural characterisation of surface modified materials by using REFLEXAFS (I): technique development	Experiment number: ME-737
Beamline: BM29	Date of experiment: <i>(Long term project)</i> from: Dec-2003 to: Jun-2005	Date of report: Feb-2007
Shifts: 72	Local contact(s): Silvia Ramos; Gianluca Ciatto	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): <div><div>Adela Muñoz Páez; Víctor López-Flores</div><div>Stuart Ansell; Daniel T. Bowron</div><div>Sofía Díaz-Moreno</div><div>Silvia Ramos</div></div> <div><div>Institute of Materials Science of Seville.</div><div>ISIS, Rutherford Appleton Laboratory.</div><div>Diamond Light Source, Ltd.</div><div>University of Birmingham.</div></div>		

Report:

The development of the capability to engineer the surface properties of materials to match specific requirements demands high quality surface characterization techniques. The ideal tool should provide chemically specific structural characterization as well as surface sensitivity and depth profiling. Ideally the characterisation method should also be applicable to systems both with and without long range order. X-ray Absorption Spectroscopy Fine Structure, EXAFS, when using the standard transmission detection system, provides all this information with the significant exception of surface sensitivity. In contrast, by detecting the reflected instead of the transmitted beam, it encompasses all these requirements because when the incident beam impinges onto a sample surface at glancing angles, in conditions close to the total reflection, only the outermost regions of the system under study are sampled. Such a technique provides information about the local structure as a function of depth as well as thin layer structure in the case of layered samples. Although it is potentially the ideal tool to study surface modified materials, experimental difficulties have hampered its widespread use in the fields of surface and materials sciences. As a solution to the

experimental challenges, we provide a detailed description of an appropriate experimental station, the sample requirements, the measuring protocols and software routines needed to optimize the collection of the data. To illustrate the capabilities of the technique the results obtained for a model multilayer sample are presented and analyzed under the total external reflection approximation.

Víctor López-Flores, Stuart Ansell, Daniel T. Bowron, Sofía Díaz-Moreno, Silvia Ramos, and Adela Muñoz-Páez.

Optimized end station and operating protocols for reflection extended x-ray absorption fine structure (ReflEXAFS) investigations of surface structure at the European Synchrotron Radiation Facility beamline BM29.

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