



## 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 via the User Portal:

<https://www.esrf.fr/misapps/SMISWebClient/protected/welcome.do>

### ***Reports supporting requests for additional beam time***

Reports can 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.



	<b>Experiment title:</b> Temperature-dependent X-ray Scattering Studies of the Solid-Liquid Interface	<b>Experiment number:</b> 28-01-610
<b>Beamline:</b>	<b>Date of experiment:</b> from: 19/2/2003 to: 25/2/2003	<b>Date of report:</b>
<b>Shifts:</b> 18	<b>Local contact(s):</b>	<i>Received at ESRF:</i>
<b>Names and affiliations of applicants (* indicates experimentalists):</b> <b>Christopher Lucas*</b> <b>Mark Gallagher*</b> <b>Ben Fowler*</b> <b>Paul Thompson*</b>		

## Report:

# Temperature-induced ordering of metal/adsorbate structures at electrochemical interfaces

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## **Abstract**

The influence of temperature changes in water-based electrolytes on the atomic structure at the electrochemical interface has been studied using *in-situ* surface x-ray scattering (SXS) in combination with cyclic voltammetry. Results are presented for the potential-dependent surface reconstruction of Au(100), the adsorption and ordering of bromide anions on the Au(100) surface and the adsorption and oxidation of CO on Pt(111) in pure HClO<sub>4</sub> and in the presence of anions. These systems represent a range of structural phenomena, namely metal surface restructuring and ordering transitions in both non-reactive spectator species and reactive adsorbate layers. The key effect of temperature appears to be in controlling the kinetics of the surface reactions that involve oxygenated species, such as hydroxyl adsorption and oxide formation. The results indicate that temperature effects should be considered in the determination of structure-function relationships in many important electrochemical systems.

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