



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>

Deadlines for submission of Experimental Reports

Experimental reports must be submitted within the period of 3 months after the end of the experiment.

Experiment Report supporting a new proposal (“relevant report”)

If you are submitting a proposal for a new project, or to continue a project for which you have previously been allocated beam time, you must submit a report on each of your previous measurement(s):

- even on those carried out close to the proposal submission deadline (it can be a “*preliminary report*”),
- even for experiments whose scientific area is different from the scientific area of the new proposal,
- carried out on CRG beamlines.

You must then register the report(s) as “relevant report(s)” in the new application form for beam time.

Deadlines for submitting a report supporting a new proposal

- 1st March Proposal Round - **5th March**
- 10th September Proposal Round - **13th September**

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.

Instructions for preparing your Report

- fill in a separate form for each project or series of measurements.
- type your report in English.
- include the experiment number 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: Operando PDF studies of Si-based anodes with solid-state and liquid electrolytes for Li-ion batteries	Experiment number: A31-1-204
Beamline: BM31	Date of experiment: from: 22 June 2023 to: 26 June 2023	Date of report: 11 September 2023
Shifts: 12	Local contact(s): Wouter van Beek & Kenneth Marshall	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): University of Oslo - Casper Skautvedt * - Alexey Kopusov * - David Wragg *		

Report:

Preliminary Report: The conducted experiment yielded partial success with notable achievements in testing polymer electrolyte cells and heated cells, ensuring the high quality of data obtained. The gathered files posed a computational challenge due to their large size, resulting in prolonged integration duration.

For our investigation, we employed a heated cell to control the temperature of the battery cell. We performed 15 scans of the cell, allowing sufficient time for cooling before each scan to mitigate beam effects. By averaging the data from these 15 scans, we generated a plot (Figure 1) for analysis. Acquiring reliable electrochemical data proved to be a challenging task, necessitating multiple attempts to effectively cycle the battery cell. Initial findings indicate favorable crystallinity, although additional data processing is necessary to clean the data accurately. In future experiments, it is recommended to focus on optimising the electrochemical performance of the cells to enhance overall results and longer experiments.

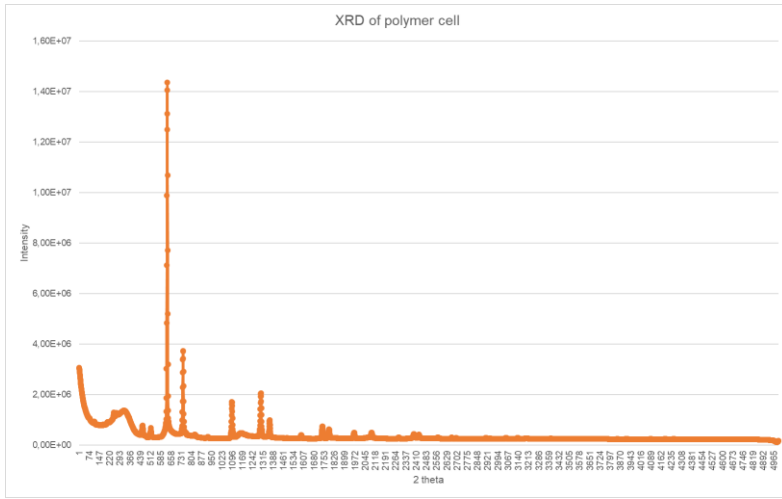


Figure 1: averaged XRD scan of the heated operando battery cell observed at the start of the experiment.