

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: Na at high temperature and pressure. High pressure meltin	Experiment number: HS-1869
Beamline: ID09A	Date of experiment: from: 27.11.2002 to: 30.11.2002	Date of report: 01.09.2003
Shifts: 15	Local contact(s): M. Hanfland	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): *M. Hanfland, ESRF		

Report:

Two runs were performed. Results are shown in Fig.1. In the first run (Fig. 1a) pressure was increased to 99 GPa, close to the fcc-cI16 phase boundary. Na melted between 418 and 418 K (~150 C). It remained liquid while the pressure was increased to 120 GPa at 463 K (~200 C). Upon cooling it froze below 370 K (~100 C). The ambient temperature crystal structure was oP8.

In the second run (Fig. 1b) pressure was increased to 123 GPa, close to the oP8 – tI20 phase boundary. Na melted between 420 and 447 K (~180 C). Upon increasing pressure it froze at 129 GPa. The crystal structure was tI20.

The melting temperature of Na between 100 and 130 GPa (cI16, oP8 phase region) is unusually low and close to its ambient pressure melting temperature (371 K, 98 C). For comparison, the melting temperature of He extrapolated from data measured to 40 GPa (Datchi et al., Phys. Rev. B, 2000) in the same pressure region should be greater than 900 K (~630 C).

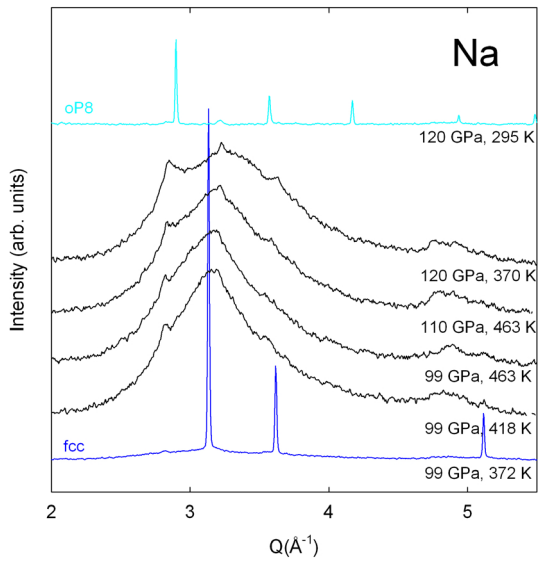


Fig 1a: Diffraction pattern of solid and liquid Na (run1).

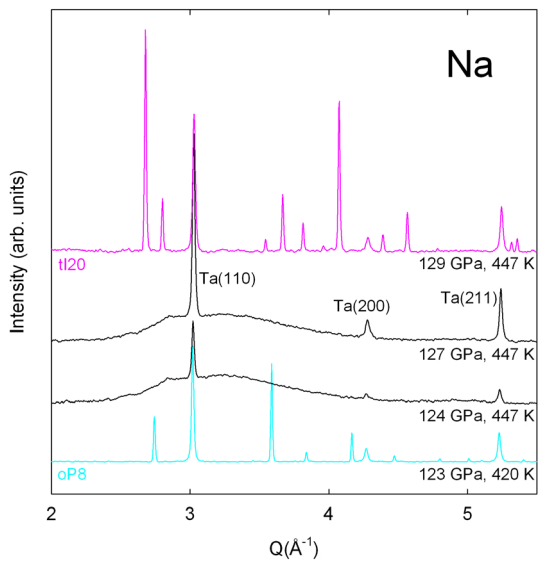


Fig 1b: Diffraction pattern of solid and liquid Na (run2)