

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.



	Experiment title: Incorporation of organic molecules in coccoliths	Experiment number: ES179
Beamline: ID22	Date of experiment: from: 27/02/2015 to: 02/03/2015	Date of report: 09.09.2015
Shifts: 9	Local contact(s): Andy Fitch	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): Prof. Dag Kristian Dysthe, Department of physics, University of Oslo Prof. Boaz Pokroy, Department of Materials Science & Engineering, Technion Anne Schad Bergsaker, Department of physics, University of Oslo Dr. Iryna Polishchuk, Department of Materials Science & Engineering, Technion Dr. Eva Weber, Department of Materials Science & Engineering, Technion		

Report:

1 scientific paper is being prepared and will soon be submitted for publication. Abstract:

The crystal properties of biogenic calcite from chalk and coccolithophores are compared to inorganic calcite using X-ray diffraction. Both freshly produced coccoliths from *Emiliana huxleyi* and *Pleurochrysis carterae* are used, as well as fossilised material from a wide selection of chalk sites. The biogenic calcite from coccoliths has crystal lattice parameters very close to that of inorganic calcite, whereas chalk shows signs of Mg incorporation, causing slightly smaller lattice parameters. Heating the samples to 250°C for two hours caused no systematic change in lattice parameters for both chalk and coccoliths, unlike results found for biogenic calcite from other marine organisms. However, heating the samples to 300°C for four hours caused a small reduction in *a* and a slight increase in *c* for all samples. This indicates that the nature of any biological material embedded in the crystals has a very different effect on the crystal lattice. We believe that this material cannot be aspartic acid, but instead a polysaccharide like the biological material previously found around both coccoliths and chalk grains, and that this polysaccharide is not incorporated into the crystal in the same way as aspartic acid has been shown to be.