

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: Extra-large pore zeolite crystallization	Experiment number: 26-01-903
Beamline: BM01B	Date of experiment: from: 21 July 2011 to: 25 July 2011	Date of report: 19-08-2013
Shifts: 6	Local contact(s): Paula macarena Abdala	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): Christine Kirschhock¹, Elena Gobechiya^{1,*}, Elke Verheyen^{1,*}, Nataliia Kasian^{2,*} ¹ Center for Surface Chemistry and Catalysis, KU Leuven, 3001 Heverlee, Belgium ² L.V. Piszarsky Institute of Physical Chemistry, National Academy of Sciences of Ukraine, 03028 Kyiv, Ukraine		

Report:

Information obtained from this experiment resulted in a manuscript, published in Nature Materials, entitled "New Zeolite by Inverse Sigma Transformation" with as authors Elke Verheyen, Lennart Joos, Kristof Van Havenbergh, Eric Breynaert, Nataliia Kasian, Elena Gobechiya, Kristof Houthoofd, Charlotte Martineau, Manuel Hinterstein, Francis Taulelle, Veronique Van Speyboeck, Michel Waroquier, Sara Bals, Gustaaf Van Tendeloo, Christine E. A. Kirschhock and Johan A. Martens.

The abstract together with full reference details are given below.

Although the search for new zeolites has traditionally been based on trial and error, more rational methods are now available. The theoretical concept of inverse σ transformation of a zeolite framework to generate a new structure by removal of a layer of framework atoms and contraction has for the first time been achieved experimentally. The reactivity of framework germanium atoms in strong mineral acid was exploited to selectively remove germanium-containing four-ring units from an UTL type germanosilicate zeolite. Annealing of the leached framework through calcination led to the new all-silica COK-14 zeolite with intersecting 12- and 10-membered ring channel systems. An intermediate stage of this inverse σ transformation with dislodged germanate four-rings still residing in the pores could be demonstrated. Inverse σ transformation involving elimination of germanium-containing structural units opens perspectives for the synthesis of many more zeolites.

Verheyen *et al.* Nat. Mater. 11 (2012) 1059 - 1064