

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:**Pressure induced magnetic collapse in siderite FeCO₃ mineral.**Experiment number:**

HE-2313

Beamline:

ID16

Date of experiment:

from: 08/11/2006 to: 14/11/2006

Date of report:**Shifts:**

18

Local contact(s):

S. Huotari

*Received at ESRF:***Names and affiliations of applicants (* indicates experimentalists):**

Aleksi Mattila*, Szabolcs Galambosi*, Keijo Härmäläinen* (University of Helsinki)

Report:

IOP PUBLISHING

JOURNAL OF PHYSICS: CONDENSED MATTER

J. Phys.: Condens. Matter **19** (2007) 386206 (8pp)

doi:10.1088/0953-8984/19/38/386206

Pressure induced magnetic transition in siderite FeCO₃ studied by x-ray emission spectroscopy

A Mattila¹, T Pykkänen^{1,2}, J-P Rueff^{3,4}, S Huotari², G Vankó^{2,5},
M Hanfland², M Lehtinen⁶ and K Härmäläinen¹¹ Division of X-ray Physics, Department of Physical Sciences, University of Helsinki, POB 64, FI-00014, Finland² European Synchrotron Radiation Facility, Boîte Postale 220, F-38043 Grenoble Cedex 9, France³ Laboratoire de Chimie Physique—Matière et Rayonnement, Université Pierre et Marie Curie—CNRS, 11 rue Pierre et Marie Curie, F-75005 Paris, France⁴ Synchrotron SOLEIL, L'Orme des Merisiers, BP-48 Saint-Aubin, F-91192 Gif-sur-Yvette, France⁵ KFKI Research Institute for Particle and Nuclear Physics, PO Box 49, H-1525 Budapest, Hungary⁶ Geological Museum, Finnish Museum of Natural History, University of Helsinki, POB 64, FI-00014, Finland

Received 5 June 2007, in final form 30 July 2007

Published 29 August 2007

Online at stacks.iop.org/JPhysCM/19/386206**Abstract**

We have investigated the magnetic state of iron in siderite FeCO₃ under high pressure using K β x-ray emission spectroscopy. Pressure induced changes in the shape of the iron K β emission lines indicate that the iron ground state changes from a low pressure magnetic state to a high pressure non-magnetic state. This transition takes place roughly at 50 GPa. This conclusion is supported by charge transfer multiplet calculations of the iron K β emission line.

(Some figures in this article are in colour only in the electronic version)