

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.



Extraction of Rare Earth Elements from Acid Mine Drainage

Experiment number:
25-01-983

Beamline: BM25	Date of experiment: from: 21 th of April, 2016 to: 25 th of April, 2016	Date of report: 09/09/2016
Shifts: 12	Local contact(s): Eduardo SALAS	<i>Received at ESRF:</i>

Names and affiliations of applicants (* indicates experimentalists):

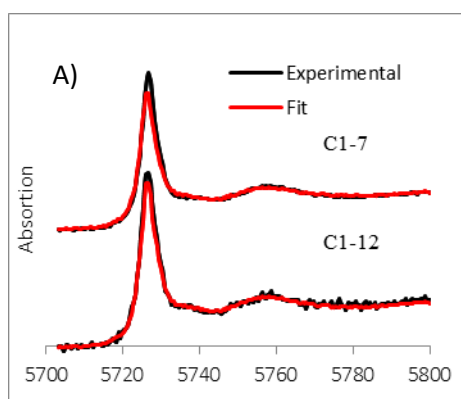
Alba Lozano-Letellier, *IDAEA, CSIC, Barcelona, Spain*

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Report:

This experiment aimed at determining the phases that are responsible for the retention of REY in acid mine drainage remediation systems. Samples from laboratory column experiments simulating the field-scale passive remediation systems were brought to the synchrotron (Ayora et al., 2016). XANES measurements at the Ce L_{III}-edge were performed at the Spline Beamline at the ESRF on two samples from the end of the column. The spectra were fitted by linear combinations of three different REE- mineral references and a Ce-sorbed basaluminite (Figure 1). The results confirm that up to 85% of REY species were associated to basaluminite.



Sample	% weight standards	
	C1-7	C1-12
Parasite	0.00	4.37
Bastnäsité	14.75	10.20
Monazite	0.00	0.00
BaCe2	85.25	85.33
Sum	100.00	99.90

Figure 1. A) Ce L_{III}- edge XANES spectra of two samples at the end of the column zone, C1-7 and C1-12. B) Composition determined by LCF of parasite, bastnäsité, monazite and Ce- doped basaluminite (BaCe₂). Basaluminite is the main component.

Other XAS experiments are being proposed to study the specific binding mechanism between REY and basaluminite.

Reference

Ayora C., Macías F., Torres E., Lozano A., Carrero S., Nieto J.M., Pérez-López R., Fernández-Martínez A., Castillo-Michel H., 2016. Recovery of Rare Earth Elements and Yttrium from Passive-Remediation Systems of Acid Mine Drainage. *Environmental Science and Technology*, 50: 8255–8262.