

Experiment Report Form

The double page inside this form is to be filled in for each experiment at the Rossendorf Beamline (ROBL). This double-page report will be reduced to a one page, A4 format, to be published in the Bi-Annual Report of the beamline. The report may also be published on the Web-pages of the FZD. If necessary, you may ask for an appropriate delay between report submission and publication.

Should you wish to make more general comments on the experiment, enclose these on a separate sheet, and send both the Report and comments to the ROBL team.

Published papers

All users must give proper credit to ROBL staff members and the ESRF facilities used for achieving the results being published. Further, users are obliged to send to ROBL the complete reference and abstract of papers published in peer-reviewed media.

Deadlines for submission of Experimental Report

Reports shall be submitted not later than 6 month after the experiment.

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 / experiment 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.
- bear in mind that the double-page report will be reduced to 71% of its original size, A4 format. A type-face such as "Times" or "Arial" , 14 points, with a 1.5 line spacing between lines for the text produces a report which can be read easily.

Note that requests for further beam time must always be accompanied by a report on previous measurements.

ROBL-CRG	Experiment title: Reduction of uranium(VI) by adsorbed Fe(II) on several clays and by structural Fe(II) in smectite in O ₂ , CO ₂ free atmosphere.	Experiment number: CH-2540
Beamline: BM 20	Date of experiment: from: 05/03/2008 to: 08/03/2008	Date of report: 05/05/08
Shifts: 9	Local contact(s): Dr. Dipanjan Banerjee	<i>Received at ROBL:</i>
Names and affiliations of applicants (* indicates experimentalists): Dr. Sudipta Chakraborty L.G.I.T. - Maison des GéoSciences Groupe Géochimie de l'Environnement Université Joseph Fourier BP53 38041 Grenoble Cedex 9 France		

Report:

We are investigating the possibility of uranyl reduction by adsorbed and/or structural ferrous iron in different clays. Homogeneous reduction of hexavalent uranium by ferrous iron in solution is sluggish due to kinetic reason. But clay surfaces provide an important role in catalyzing the reaction between these two species at the clay-water interface. The goal was to analyze samples by XANES and EXAFS for oxidation states and atomic environment of both U as well as Fe. 12 Samples were prepared maintaining different reaction conditions in XAS sample holder SH-01B with double confinement (first confinement is kapton tape and second is heat sealing of the sample holder) inside the glovebox. Unfortunately the heat sealing step was not done correctly and so ESRF safety group did not allow the samples to analyze under cryogenic condition. So the samples were run at room temperature but there was beam-induced photooxidation of U(IV) to U(VI). Then the samples were re-packed, heat sealed correctly and run under cryogenic condition. But all the samples were already oxidized during repacking confirmed from XANES which shows U(VI) spectra for those cases where U(IV) was expected!! These measurements will be performed again in the next beamtime.