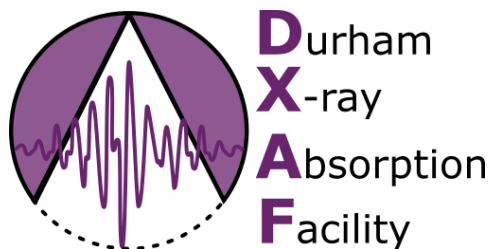


Durham X-ray Absorption Facility (DXAF) – Newsletter June 2023



Hope you all are enjoying the recent heatwaves! Welcome to the June instalment of the DXAF newsletter. The facility has seen a growth in new users and now the development of a new website, so please read further to see what has gone on at the DXAF!

What has been going on?

Closer than ever towards *in situ*!

Over the last few months, the facility has been developing an *in situ* and *operando* cell for the EasyXAFS300+. We are happy to say that the cell is currently underproduction and is predicted to be available for users to use around September 2023.

Key features of the cell include:

- A heated 13 mm pellet mount, which will be monitored with a thermocouple.
- Expected achievable temperature of 450 °C, and this could be higher once determined during the testing phase by the facility.
- Gas feed inlet and outlet. Filling up an internal chamber with the desired gases by the user.
- Expected initial testing will involve routine experiments such as H₂-TPR and O₂-TPO.
- Use at ambient pressures, with Kapton sealed windows to maximise transmission of beam from X-ray source through the sample.

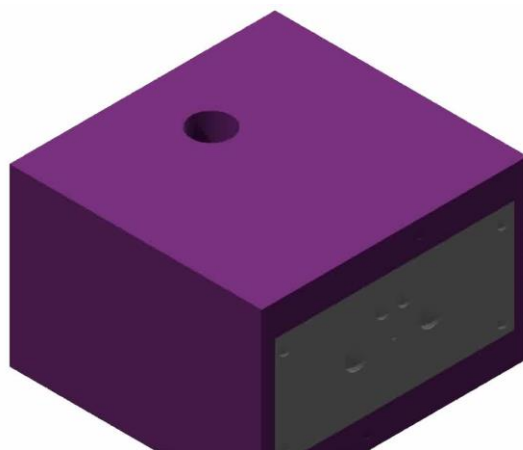


Fig. 1: 3D model of the high temperature pellet cell.

DXAF talking to industry

DXAF was privileged to have scientific discussions with several companies over the last few months, where we displayed the benefits of lab-based XAS towards industrial application and how the potential of *in situ* studies can benefit the companies' aims and objectives. Let us know if you and your colleagues would like to learn more!

Our new website!

Please come and visit our new website where we will showcase information about the facility, which includes sample submission, instrument specification and contact information.

The website will become live in the upcoming days so stay tuned!!

Trial experiments prove a hit with users

Thank you all who contributed to our early 'light touch' experiments. We have been able to produce various spectra on a wide range of elements in *ex situ* pellet mode and this has helped us in the development of new sample holders, such as the one used for capillaries and to understand what the instrument is capable of.

What is coming up?

DXAF's *in situ* cell is currently in development and predicted to be in use by the facility by the next newsletter. The expected availability of the cell for users to use around September 2023.

We are also exploring the possibility of a liquid transmission cell – if you think this is of interest, please do drop us a note. The key constraint is elements of interest still need to be ~ 1 wt. % in the solution, but there appear to be use cases for this, so we are trying to configure something to hold air sensitive solutions with a short path length suitable for such experiments. We would welcome any input you might have on your potential needs.

Contact Emails:

General enquiry: xafs@durham.ac.uk

Monik Panchal: monik.panchal@durham.ac.uk

Simon Beaumont: simon.beaumont@durham.ac.uk

Useful links:

<https://www.easyxafs.com/>

<https://research.ncl.ac.uk/conexs/about/>

Durham Uni DXAF website coming soon!