



Contribution ID : 148

Type : **Poster**

Extreme environments at the XAS beamline

Thursday, 20 November 2014 17:30 (90)

X-ray Absorption Spectroscopy is a technique for structure determination and speciation studies which is well suited to the in situ study extreme environments. Extreme environments are systems under high pressure and high temperature. These systems occur in nature when geofluids dissolve metals from large regions of host rock, and later precipitate the metals as ore deposits. Apart from understanding the formation of ore deposits, understanding geofluids is important in developing ore processing, and for geothermal power stations.

Two new systems for studying extreme environments are being implemented in hutch C at the XAS beamline. Hutch C is a separate experimental station to hutch B, the main experimental hutch where routine XAS experiments are performed. One of the aims of the extreme environments project is the set up hutch C to run independently of hutch B. An example is the parallel implementation of motor control, and detector counting chains.

The first new system is the maestro autoclave cell, developed by Joel Brugger et al. The maestro cell is a large volume cell which can run temperatures from 25 – 600 degrees C, and pressures from 1 to 600 bars. The large volume cell allows us to study dilute metal ions in solution such as geofluids encountered in nature.

The second system is the Hydrothermal Diamond Anvil Cell (HyDAC). This cell can impart pressures between 0.1 – 5 GPa, and temperatures 25 – 1000 degrees C. The volume of the HyDAC is made larger than other DACs by milling into the two diamonds.

Keywords or phrases (comma separated)

XAS, XAFS, XANES, Extreme environments, geofluids

Summary

Primary author(s) : Mr RAE, Nicholas (Australian Synchrotron)

Co-author(s) : JOHANNESSEN, Bernt

Presenter(s) : Mr RAE, Nicholas (Australian Synchrotron)

Session Classification : Welcome Function, Poster Session, Exhibition

Track Classification : Beamlines, Instrumentation and Techniques