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First experiments with D-DIA apparatus on XAS

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The Macquarie University-Australian Synchrotron D-DIA apparatus is a large-volume solid-media apparatus for high pressure, high temperature in-situ x-ray experiments. The apparatus can subject a sample volume of up to 5 mm^3 to pressures to 6 GPa and temperatures to 1500 ℃.

During 2016/2 initial experiments were conducted on the XAS beamline. Uranium and Thorium L3-edge transmission XANES spectra were successfully collected from silicate liquid at ~2 GPa, 1350 ℃. Further tests with the sample assembly under ambient conditions indicate the lowest energy edge accessible in the apparatus with the present sample assembly is Ge K (11.1 keV).

XAS was run in mirrorless mode at 38 keV for a proof-of-concept falling-sphere viscometry experiment. Soda-lime glass was rapidly melted by heating from ~800 ℃ to ~1400 ℃ at ~2 GPa, and a falling platinum sphere was imaged with a CCD via YAG-mirror-lens setup.

Prospects for future applications of the D-DIA apparatus at the Australian Synchrotron will be discussed.

Keywords or phrases (comma separated)

Are you a student?

No

Do you wish to take part in</br>the Student Poster Slam?

No

Are you an ECR? (<5 yrs</br>since PhD/Masters)

Yes

What is your gender?

Male

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