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Gas-phase artefacts in NEXAFS spectra from ambient-pressure gas environments

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At pressures above 0.1 mbar, gas-phase NEXAFS spectra recorded in typical AP-XPS endstations or cells are significantly affected by photon absorption within the gas along the path to the detection volume. The Figure shows experimental C K-edge spectra of CO_2 measured in TEY mode at the beamline entrance (Aperture) and 15 mm from the entrance (Detector). It illustrates the effects which range from line broadening to peak splitting and critically depend on pressure and the distance between beamline entry and detector. If the attenuation of the photon beam exceeds the level of a few percent separating the NEXAFS signal of a solid sample in a gas environment from the gas-phase signal cannot be achieved by simple subtraction.
We present experimental data and model spectra for various gases and discuss strategies of removing the gas-phase signal from NEXAFS spectra of solid samples.

if ”Other”, please specify:

AP NEXAFS

I apply for a travel grant

No

Primary authors: Dr VAN SPRONSEN, Matthijs (Diamond Light Source); Dr GRINTER, David (Diamond Light Source); Dr FERRER, Pilar (Diamond Light Source); Dr SWALLOW, Jack (University of Oxford); Prof. WEATHERUP, Robert (University of Oxford); HELD, Georg (DIamond Light Source)

Presenter: HELD, Georg (DIamond Light Source)

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