Poster

New developments in non-ambient X-ray diffraction instrumentation

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Non-ambient X-ray diffraction (NA-XRD) is an essential tool for the investigation of crystalline materials. It can provide insights into processes such as phase transitions, catalyst activation and degradation or sintering processes under different temperatures, pressures or gas atmospheres in-situ. These in-situ investigations allow the observation of intermediates or semi-stable phases, that are not accessible through ambient methods.

NA-XRD experiments are usually realized through the addition of a non-ambient XRD attachment to lab sized diffractometers or beamline setups. Nowadays, there is a large variety of such attachments available on the market, covering a wide range of parameters, and compatible with almost all commercially available diffractometers. Despite this, there is a constant effort to develop new hardware that extends the parameter range, improves the performance, or allows the combination of different parameters or measurement techniques. This includes both custom built solutions for highly specialized experiments, and new multi-user and multi-application hardware released to the general market.

While NA-XRD hardware is available for almost all commercially available diffractometers, the right diffractometer can significantly influence the ease of use, efficiency and data quality that can be obtained from in-situ NA-XRD. The recently launched XRDynamic 500 automated multipurpose powder X-ray diffractometer from Anton Paar has set new standards in terms of data quality, automation and efficiency for laboratory powder diffractometers. Anton Paar's NA-XRD attachments are perfectly integrated into the hard- and software (plug-and play mode, integrated control unit, built-in connections) and guarantee best-in-class convenience for your non-ambient and operando XRD studies.

In this presentation, we will give an overview of the latest developments in NA-XRD instrumentation from Anton Paar, and show how modern diffractometers can help users to perform reliable and reproducible non-ambient experiments with high data quality and minimal effort.

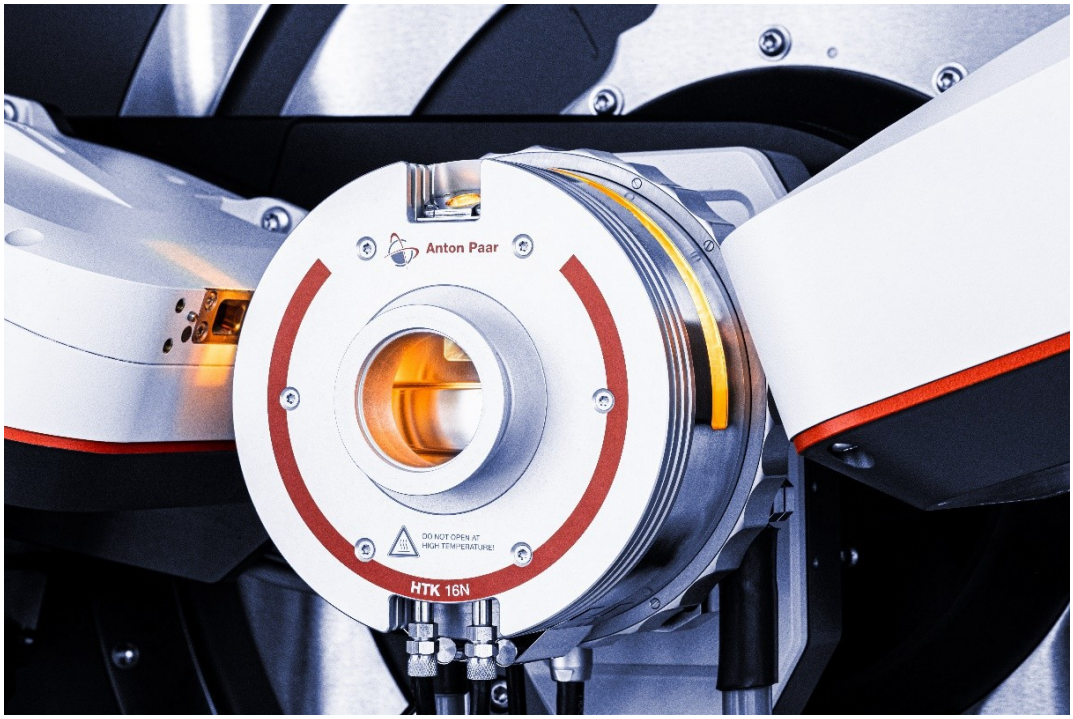

Figure 1. Anton Paar's HTK 16N High-Temperature Chamber installed on XRDynamic 500.