

Anton Paar's HPC 900 chamber is designed for *in situ* powder X-ray diffraction studies of solid-state and solid-state-gas reactions at high pressure and temperatures in variable gas atmospheres. The HPC 900 chamber can only be used with Mo or Ag radiation.

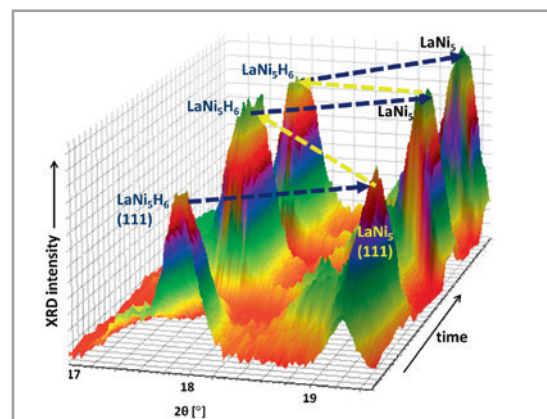
## Non-ambient attachment for XRD

# HPC 900 – high-pressure chamber

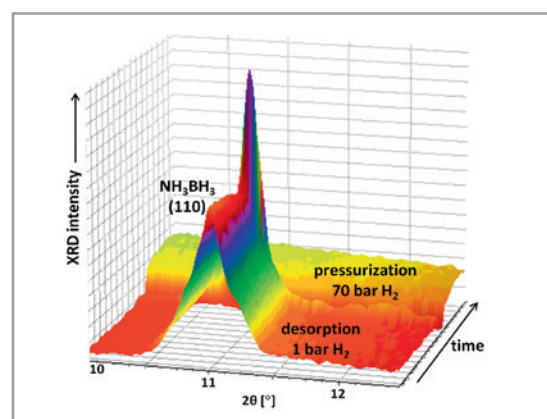
### Benefits

- Both high temperature (up to 900 °C) and high pressure (up to 100 bar)
- High temperature uniformity over the entire sample volume due to the environmental heating
- Accurate temperature measurement with a thermocouple close to the sample
- 'Double wall' chamber design consisting of inner pressure core and outer safety shell flushed with N<sub>2</sub> gas to prevent accumulation of dangerous gas mixtures
- Almost no restrictions on sample thickness
- A gas flow ring around the sample port prevents oxidation of air-sensitive samples

### Application examples



H<sub>2</sub> sorption/desorption in system La-Ni-H

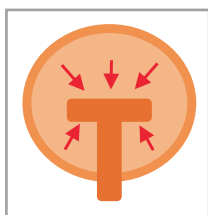


Decomposition of ammonia borane accompanied by the release of H<sub>2</sub>

# HPC 900 chamber



## Features



From room temperature to 900°C  
Heating rate: 1 - 60 °C/min (depending on gas atmosphere)

Environmental heater

**Air**  
up to 500°C

**N<sub>2</sub>**  
up to 500°C

**He**

**CO<sub>2</sub>**  
up to 500°C

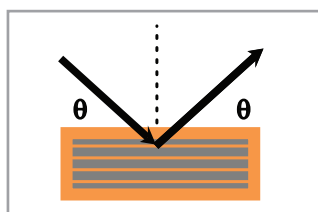
**O<sub>2</sub>**  
up to 500°C

**H<sub>2</sub>**

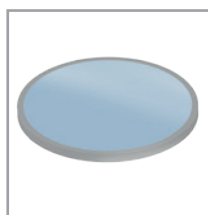
Atmospheres

**Gas pressure**

From 1 bar to 100 bar

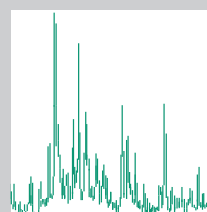


Flat plate reflection geometry.  
Sample holders made of Al<sub>2</sub>O<sub>3</sub> and inconel.

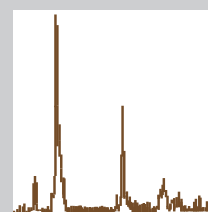


Zero background insert

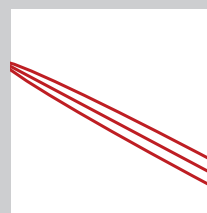
## Applications



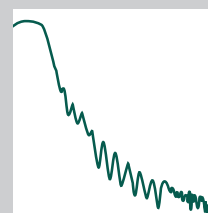
Powder XRD



Basic grazing incidence XRD\*



Basic stress\*



Basic reflectivity\*

\* Limited sample alignment options (no tilt and rotation axis)

## Conclusion

The HPC 900 reactor chamber is an ideal choice for *in situ* studies of temperature- and pressure-induced phase transformations, changes of structural properties of inorganic and organic powders and solids interacting with various gases.