



The TTK 600 chamber from Anton Paar is designed for powder X-ray diffraction experiments in both reflection and transmission geometry, in the temperature range from -190 °C to +600 °C in air, vacuum and inert atmospheres.



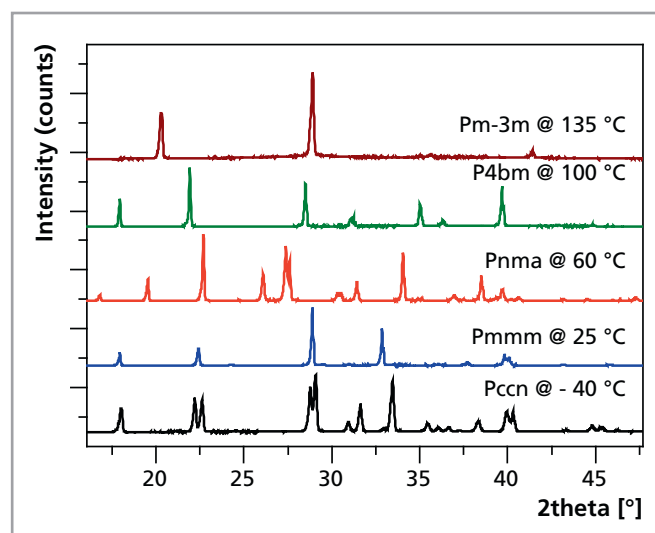
Non-ambient attachment for XRD

TTK 600 – low-temperature chamber

Application example

Benefits

- Measurement in both reflection and transmission geometry
- Wide temperature range
- Choice between liquid nitrogen and compressed air cooling
- Accurate temperature measurement with a thermocouple close to the sample
- Easy handling and exchange of sample
- Beam knife and beam stop to minimize background at low angles for reflection and transmission measurements, respectively
- Optional antechamber for transfer of air-sensitive samples

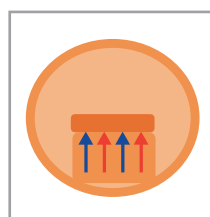


Five phases of ammonia nitrate detected in the temperature range from -40 °C to 135 °C. The Pccn phase remains stable down to -190 °C

TTK 600 chamber



Features



Heating/cooling plate

With liquid nitrogen cooling

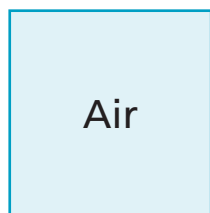
- -150 °C to +450 °C (dry air, inert gas)
- -190 °C to +600 °C (vacuum 10^{-2} mbar)

With compressed-air cooling

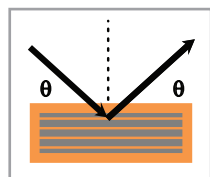
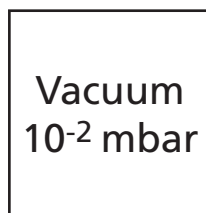
- -10 °C to +450 °C (dry air, inert gas)
- -20 °C to +600 °C (vacuum 10^{-2} mbar)

Without active cooling

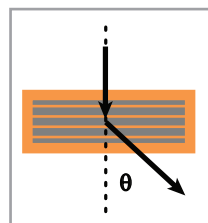
- From room temperature to +450 °C (air, inert gas)
- From room temperature to +600 °C (vacuum 10^{-2} mbar)



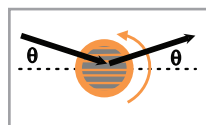
Atmospheres



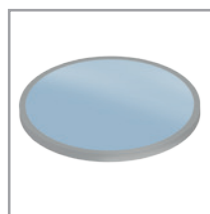
Flat plate reflection geometry. Sample holders made of nickel.



Transmission geometry, foils (Kapton, graphite, nickel)

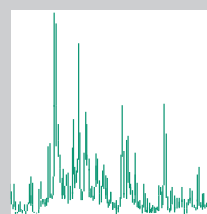


Transmission geometry, capillary. Glass/Quartz capillaries.

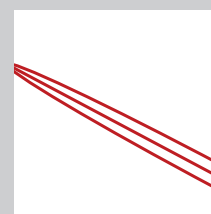


Zero background insert

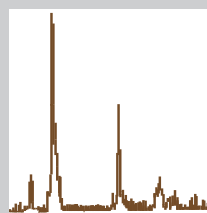
Applications



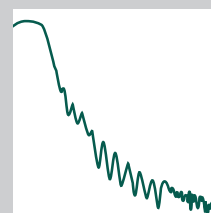
Powder XRD



Basic stress*



Basic grazing-incidence XRD*



Basic reflectivity*

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

Conclusion

The TTK 600 is a versatile low-temperature chamber combining both reflection and transmission measurement geometries. It is an ideal choice for *in-situ* studies of phase transformations, changes of structural properties of inorganic and organic powders and thin solid objects in a wide temperature range.