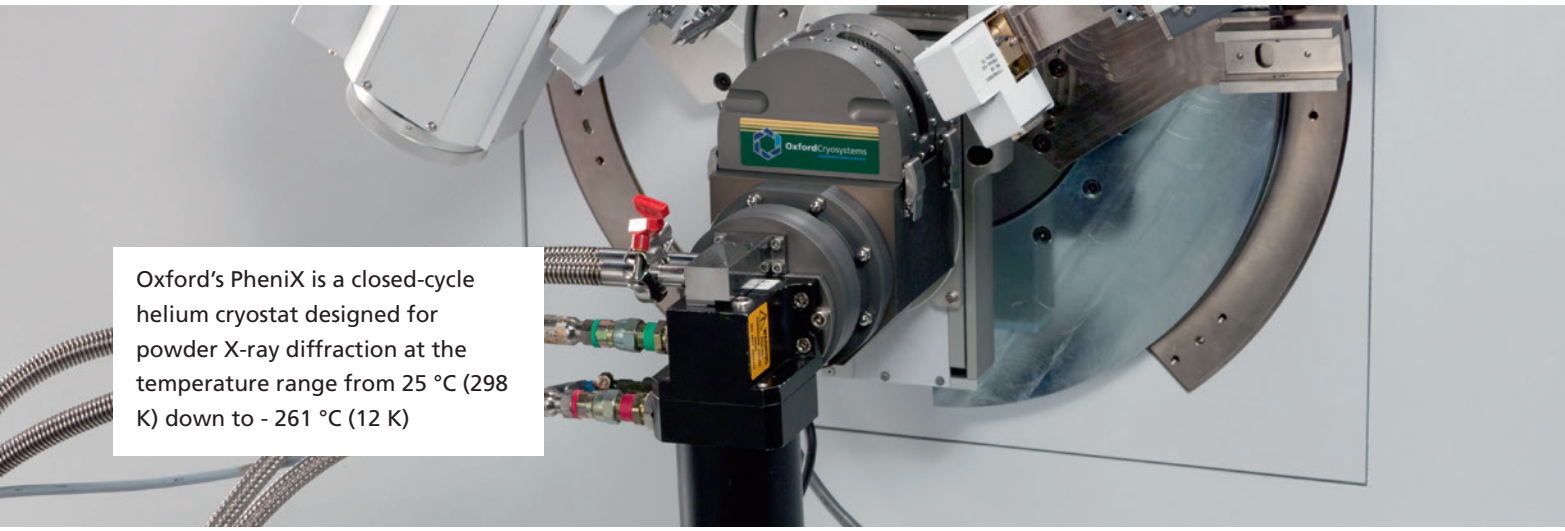
PANalytical
get insight



Oxford's PheniX is a closed-cycle helium cryostat designed for powder X-ray diffraction at the temperature range from 25 °C (298 K) down to - 261 °C (12 K)

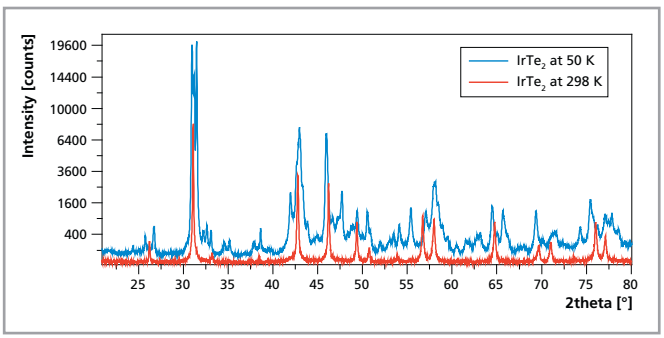
Non-ambient attachment for XRD

PheniX – low-temperature cryostat

Benefits

- Extremely low temperatures
- High temperature uniformity and stability across the sample (0.1 K at 12 K)
- Fast cool-down and warm-up of the sample
- Easy to use and operate due to the compact design of the closed-cycle cryostat
- Virtually no helium consumption
- Easy sample preparation and mounting

Application example



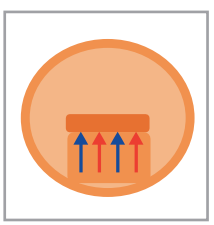
The structure of the low temperature phase of IrTe2 was solved using combined single crystal neutron diffraction and powder X- ray diffraction data.

H. Cao et al. Phys. Rev. B 88, 115122 (2013) Courtesy of Huibo Cao, Oak Ridge National Laboratory

PheniX
low- temperature cryostat

Empyrean X'Pert³ Powder

Features

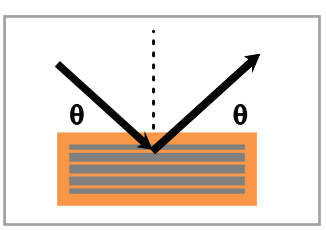


12 K – 290 K (vacuum)
Cool-down time to 100 K: 40 min
Cool-down time to 12 K: 60 min
Warm-up time from 12 K: 45 min

Heating/cooling (plate)

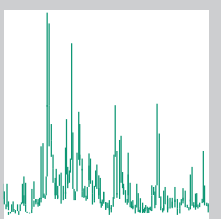
Vacuum
10^{-4} mbar

Atmospheres

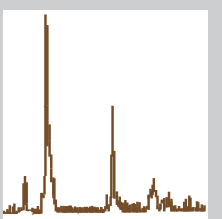


Flat plate reflection geometry.
Sample holders made of Cr-Cu alloy.

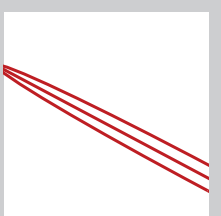
Applications



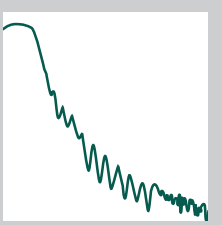
Powder XRD



*Basic grazing incidence XRD**



*Basic stress**



*Basic reflectivity**

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

Conclusion

The PheniX cryostat is an ideal choice for in situ powder XRD studies of organic and inorganic materials at extremely low temperatures, down to 12 K (-261°C).