

Low-temperature XRD Studies between $-193\text{ }^{\circ}\text{C}$ and $450\text{ }^{\circ}\text{C}$

TTK 450

The TTK 450 Low-Temperature-Chamber is a versatile sample stage for X-ray diffraction studies in the temperature range from $-193\text{ }^{\circ}\text{C}$ to $450\text{ }^{\circ}\text{C}$. Measurements may be carried out either under vacuum, air or inert gas conditions.

For work at low temperatures, liquid nitrogen is transferred by insulated hoses from a Dewar vessel to the chamber. The hoses are connected with a specially designed two-pipe ball connector which can be turned by approx. 180° , even if the apparatus is frozen.

The flow rate of liquid nitrogen can be automatically controlled by using the LNC Liquid Nitrogen Controller. This precise control unit in combination with the TCU 110 temperature control unit guarantees short cooling and heating cycles.

The TTK 450 sample holder is easily accessible. No realignment is necessary for high and low temperatures or for different sample holders.

The TTK 450 is compact in design and easy to operate - a well-established tool for XRD studies in the low temperature range!



Typical applications

- ▶ In-situ characterization of the crystal structure of pharmaceutical substances and food ingredients
- ▶ Changes in chemical composition during solid-solid and solid-gas reactions
- ▶ Accurate determination of coefficients for thermal lattice expansion
- ▶ Investigation of polymer materials
- ▶ Structure studies of samples with melting points near or below ambient temperature

Technical data

Temperature range:	$-193\text{ }^{\circ}\text{C}$ to $450\text{ }^{\circ}\text{C}$ (liquid nitrogen cooling) $-10\text{ }^{\circ}\text{C}$ to $450\text{ }^{\circ}\text{C}$ (compressed air cooling)
Atmospheres:	air, inert gas, vacuum (10^{-2} mbar)
X-ray geometry:	reflection