



BENCHTOP XRD ANALYZER - X-RAY DIFFRACTOMETER - FRINGE CLASS

Patented new θ -2 θ coupling linkage angle measuring system, single-axis drive mechanism, concise and simple, determined to be extraordinary.

The Benchtop XRD Analyzer – X-ray Diffractometer – FRINGE CLASS is a desktop X-ray diffractometer. It combines XRD, XRF, computer software, and other technologies. This instrument enables fast qualitative and quantitative analysis, crystal structure analysis, material structure analysis, and crystallinity determination for various sample forms like powder, block, or thin film.

It features high precision, accuracy, stability, wide applicability, simple operation, and intelligence. It serves materials research, universities, research institutes, building materials, metals, minerals, plastics, pharmaceuticals, semiconductors, and various other fields by providing high-precision analysis.



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APPLICATIONS

The Benchtop XRD Analyzer – X-ray Diffractometer – FRINGE CLASS supports phase identification and crystal structure analysis for titanium dioxide, alumina powder, catalysts, battery materials, advanced ceramics, and academic research samples.

Benchtop XRD Analyzer - Titanium dioxide

Titanium dioxide

Benchtop XRD Analyzer - Alumina powder

Alumina powder

Benchtop XRD Analyzer - Graphitization degree

Graphitization degree

Benchtop XRD Analyzer - Ceramic material

Ceramic material

Benchtop XRD Analyzer - Asbestos material

Asbestos material

Benchtop XRD Analyzer - Cement

Cement

Benchtop XRD Analyzer - Talc

Talc

Benchtop XRD Analyzer - Other fields

Other fields

Benchtop XRD Analyzer - Pharmaceutical analysis

Pharmaceutical analysis

For example, determination of montmorillonite powder, API crystal form analysis of API, etc.

FEATURES

Air spring large window lift door

The air spring large window lift door not only saves desktop space but is also suitable for any desk, effectively improving space utilization.

Built-in water circulation cooling system

The FRINGE CLASS features a built-in water circulation cooling system, eliminating the need for an additional chiller. The software can display real-time information such as the X-ray tube water temperature, flow, and flow rate.

Safety

During testing, it features an automatic cutting protection device and a safety linkage lock device to ensure safety. Once closed, the sample chamber is fully enclosed, and the operation interface includes a function to close the sample chamber.

XRD for everyone

After collecting diffraction data, CrystalX automatically conducts phase analysis and provides the percentage of each component of the phase. This significantly reduces user requirements, as users only need to click "start testing" and let the CrystalX software handle the rest.

Integrated sola slits

The integrated sora slits, devoid of any motion-adjustable parts, enhance the reliability of the goniometer system. This feature enables the FRINGE CLASS desktop XRD to be installed on in-vehicle laboratory platforms.

DPPC detector

Digital multi-channel analysis technology can differentiate diffraction peaks from fluorescence interference without requiring a monochromator, thereby improving diffraction intensity.

THEORY & METHOD

X-ray diffraction (XRD) identifies the crystalline structure of a material, which reveals what phases or compounds it contains. Because every crystalline substance has a unique atomic arrangement, XRD acts like a fingerprint reader for solids.

Bragg's Law and Diffraction

The analyzer directs a beam of X-rays at the sample. The atoms in a crystal are arranged in regular planes, and these planes reflect the X-rays. When the path difference between rays reflected from adjacent planes equals a whole number of wavelengths, the rays reinforce and produce a strong diffracted beam. This condition is described by Bragg's law, where n times the wavelength equals $2d$ times the sine of θ , and d is the spacing between crystal planes.

From Diffraction Pattern to Identity

The instrument measures the angles and intensities of the diffracted beams to build a diffraction pattern. Each crystalline phase produces a characteristic set of peaks, so comparing the pattern against reference databases identifies the phases present and can reveal crystallite size and strain. This makes XRD a core tool for material identification and quality control.

TECHNICAL SPECIFICATIONS

Goniometer	θ -2 θ linkage vertical goniometer, diffractive circle radius 150mm
Angle measuring range of Angle meter	-3° - +150°
Precision	The deviation of $\pm 0.02^\circ$ in the full spectrum
FWHM	$<0.04^\circ 2\theta$
Sola slit	The integrated sora slits, without any motion-adjustable parts, increase the reliability of the goniometer system, allowing the FRINGE desktop XRD to be installed on in-vehicle laboratory platforms
X-Ray Tube	Cermet X-ray tube, with maximum power of 2.2KW, focus: 1 x 10 mm, default configuration cu target, optional Co, Cr, Mo target
High Voltage Generator Power	The maximum output power of the high voltage generator is 600W
Size	580 x 450x 680mm□ L×W×H□
Weight	120KG
Power Supply	220V±10V, 50Hz, the whole power is 1000W (110V also available)
Heat dissipation	FRINGE CLASS has a built-in water circulation cooling system, no need to add additional chillers. The software can display the water temperature, flow rate and other information in the X-ray tube in real time
Detector	DPPC detector
Interface	The compact home wall plug provides power, and the USB interface connects to the PC for controlling the XRD
Air source	A 2-way air supply interface is available for in-situ analysis or atmosphere protection
Security	The FRINGE CLASS has an air spring large window lift door, which can observe the in-situ analysis process without dead angle, and can effectively shield X-rays. It has a protection and safety interlock device that automatically cuts off during the test process. The operation interface has the function of closing the sample compartment

Cloud service capabilities	FRINGE CLASS uses a synchronizable mobile APP service to support card management of diffraction data and access to knowledge management systems
CrystalX software	A special crystal analysis software CrystalX for FRINGE CLASS. After obtaining diffraction data, CrystalX automatically conduct phase analysis, and give the percentage of each component of the phase, greatly reducing the requirements of the user, no manual retrieval, no need to buckle the background, no need to smooth, no need to manually peak, just need to click "start testing", the rest to the CrystalX software



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