

Lattice GO

Portable X-ray Diffractometer

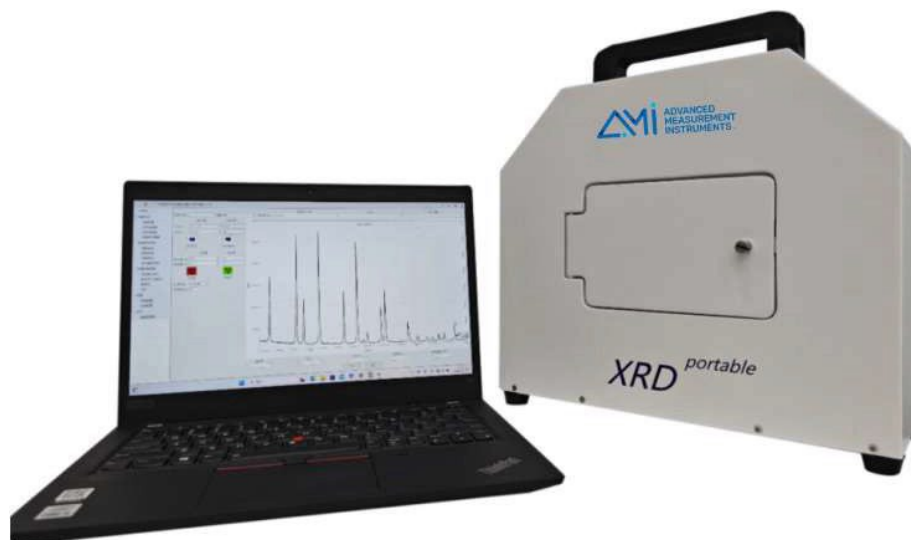
INTRODUCTION

"Diffraction Without Limits"

The **Lattice GO** redefines portable X-ray diffraction, delivering laboratory-grade performance in a compact, lightweight system. Designed for versatility, it integrates a specialized X-ray source, Bragg-Brentano diffraction geometry, and an advanced 2D array detector to generate high-quality XRD spectra in minutes.

Optimized for field research, on-site quality control, and space-constrained laboratories, the **Lattice GO** provides high-intensity data with exceptional angular precision, rivaling traditional benchtop systems. Its rugged construction, rapid scanning capability, and user-friendly operation ensure reliable results in any environment.

With the **Lattice GO**, high-resolution diffraction is no longer confined to the lab—bringing powerful material analysis wherever it's needed.



*Figure 1: Instrument Setup for the **Lattice GO***

KEY FEATURES

- Compact and Portable Design**
 A lightweight, space-efficient system suitable for benchtop use or field deployment, making it ideal for laboratories with limited space or on-site analysis.
- Rapid, In-Situ XRD Analysis**
 Enables immediate diffraction measurements following material synthesis, facilitating real-time screening and informed decision-making.
- Laboratory-Grade Data Quality**
 Delivers high-intensity diffraction patterns with angular precision comparable to full-scale laboratory diffractometers.
- Bragg-Brentano Diffraction Geometry**
 A proven configuration for accurate and reproducible powder diffraction analysis, ensuring high data reliability.
- Advanced X-ray Source**
 Optimized for enhanced signal stability and consistent performance across diverse sample types.
- High-Resolution 2D Array Detector**
 Provides rapid data acquisition with broad angular coverage, capturing high-fidelity diffraction patterns with excellent signal-to-noise ratio.
- Optimized Analytical Workflow**
 Enables efficient sample pre-screening, reducing the need for external testing and improving overall analytical throughput.

SPECIFICATIONS

X-ray tube	30 W, 30 kV / 1 mA
X-ray tube target material	Cu
Goniometer	Theta / 2theta geometry, the radius of the goniometer is 110 mm
Detector	Photon direct-read two-dimensional array detector
Maximum scanning range	0° - 130°
2Theta Minimum step size	±0.01°
Measure speed	Two speeds available: 6°/min and 12°/min
Battery Runtime	3 hours
Volume and Weight	L 4.8 in (120 mm) × W 11.9 in (300 mm) × H 11.9 in (300 mm), 26.5 lbs (12 kg)

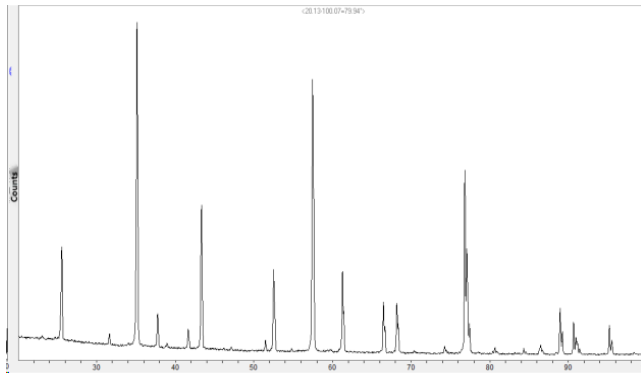


Figure 2: Ruby Standard Sample (NIST1976)

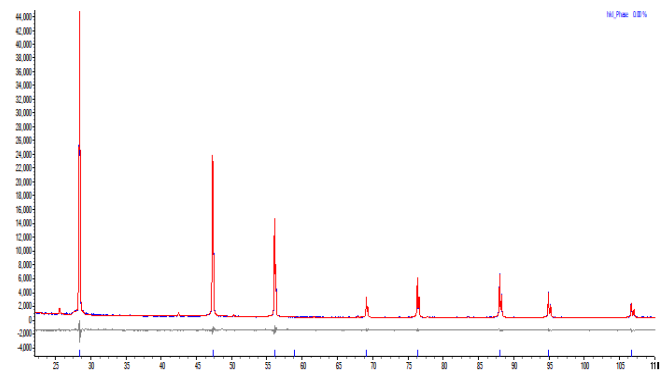


Figure 3: Silicon Powder Measurement Data and Rietveld Structure Refinement

APPLICATIONS

Mineral Industry:

The **Lattice GO** portable X-ray diffractometer is becoming an essential tool for geological exploration teams, providing rapid, reliable analysis directly in the field. Its ability to perform real-time phase identification and quantitative analysis empowers geologists to make faster, more informed decisions.

- **On-Site Mineral Analysis**
Qualitative and quantitative identification of mineral phases to support mineralogical research and exploration.
- **Geological Feature Evaluation**
Analyze surrounding rock structures in mineralization zones to understand ore genesis and mineral distribution.
- **Process Optimization**
Identify ore formation mechanisms and determine appropriate mining, beneficiation, refining, and smelting methods.
- **Core Logging Support**
Detect fine-grained fragments, complex lithologies, and subtle mineral changes to guide drilling and stratigraphic interpretation.
- **Rapid Ore Quality Assessment**
Conduct fast, quantitative mineral content analysis on-site to inform mineral trading and field decisions.
- **Urban Resource Recovery**
Identify and quantify mineral content from recycled materials for effective urban mining and resource reuse.

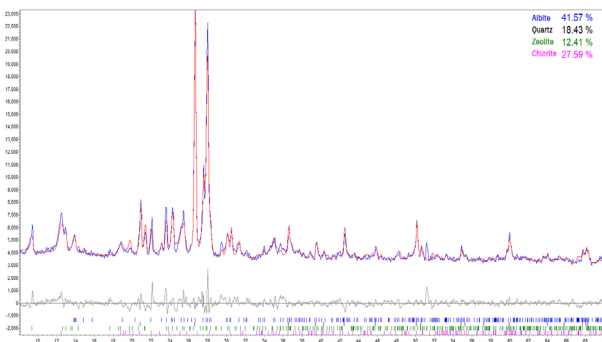


Figure 4: Sandstone Sample Diffraction Pattern and
Standard-Free Quantitative Analysis

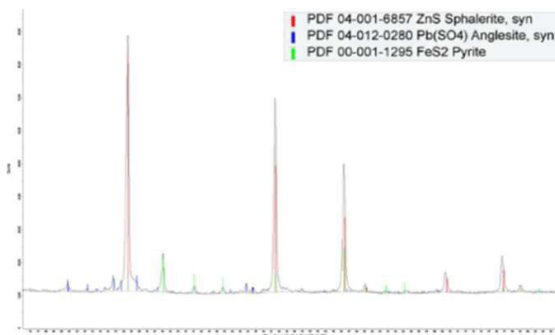


Figure 5: Zinc Concentrate Diffraction Pattern and
Qualitative Analysis

Cultural Heritage:

The **Lattice GO** enables non-destructive, on-site analysis of culturally significant materials, making it an invaluable tool for conservation scientists, archaeologists, and museums. Its precision and portability support preservation, research, and authentication of priceless artifacts.

- **Phase Analysis of Artifact Materials**

Identify crystalline phases in bronzeware, ironware, ceramics, pigments, and mural base layers.

- **Corrosion and Weathering Studies**

Analyze corrosion products and weathering layers to understand degradation mechanisms and guide conservation strategies.

- **Restoration and Preservation**

Assist in development of preservation techniques for murals, stone relics, and metal artifacts through material characterization.

- **Provenance Studies**

Determine the geographic origin and production techniques of cultural relics using mineralogical fingerprinting.

- **Authentication and Anti-Counterfeiting**

Verify authenticity of artifacts by comparing structural signatures to known references.

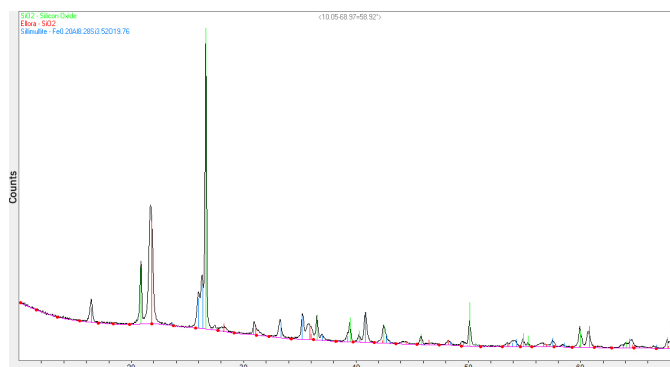


Figure 6: Ancient Ceramic Fragment Diffraction Data and Qualitative Analysis

Security and Drug Safety:

The **Lattice GO** brings advanced, non-destructive XRD capabilities to law enforcement and forensic science, enabling rapid, on-site analysis with minimal sample preparation. Delivering real-time results, it supports fast, accurate decision-making in critical situations.

- **On-Site Drug Identification**

Perform rapid, non-destructive qualitative and quantitative phase analysis of narcotics, new psychoactive substances (NPS), and precursor materials.

- **Criminal Investigation Support**

Identify and characterize controlled substances in the field to aid forensic investigations and track drug trafficking routes and sources.

- **Non-Destructive Forensic Testing**

Preserve sample integrity while obtaining precise, high-resolution diffraction data for reliable forensic analysis.

- **Drug and Substance Characterization**

Conduct on-site qualitative and quantitative analysis of illicit drugs, counterfeit pharmaceuticals, and precursor materials for trafficking detection and source attribution.

- **Trace Evidence Analysis**

Detect and classify trace compounds such as cyanide, organic contaminants, paper fillers, toxic additives, and soil or mineral fragments from crime scenes or stolen cultural relics.

- **Security Screening at High-Risk Locations**

Rapidly identify illicit substances, explosives, and hazardous materials at border checkpoints, airports, train stations, and public venues.

- **Explosives and Contaminant Detection**

Analyze explosive compounds and their decomposition residues, as well as adulterants such as talcum powder and borax in consumer goods and food products.

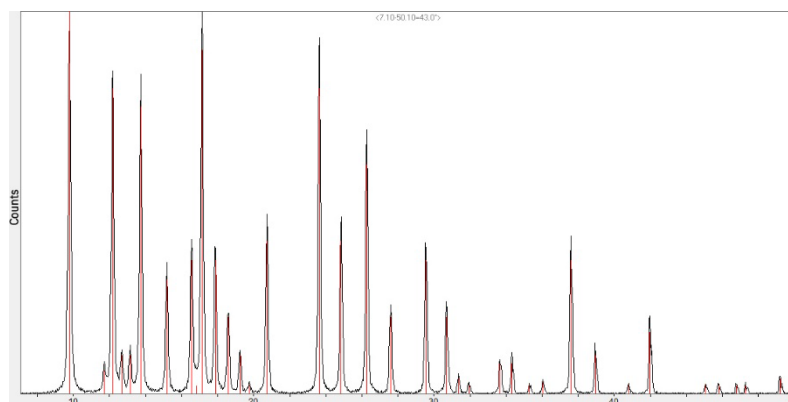


Figure 7: Heroin Hydrochloride XRD Pattern

ABOUT US

Advanced Measurement Instruments (AMI), consisting of Altamira Instruments, Rubolab, ISI, and JWGB, offers a comprehensive portfolio of solutions for all your material characterization needs. As a global and diversified company, we have many years of professional experience, and our mission is to empower scientists and researchers around the world in the field of materials science by providing cutting-edge analytical instruments. We are committed to providing high-quality, user-friendly, cost-effective products and services to ensure that customers get the best solutions in research and industrial applications.

Innovation Within Reach



MISSION

At AMI, our mission is to advance the world of materials characterization by providing cutting-edge analytical instruments that empower customers in commercial and research fields.

