

Field Portable XRD/XRF

Specifications

XRD resolution: 0.25° 2θ FWHM

XRD range: $5-55^\circ$ 2θ

Detector type: 1024 x 256 pixels - 2D Peltier-cooled CCD

XRF energy resolution: 200 eV at 5.9 keV

XRF energy range: 3 to 25 keV

Sample grain size: $< 150\mu\text{m}$ crushed minerals - (100 mesh screen, 150 μm)

Sample quantity: $\sim 15\text{mg}$

X-ray target material: Co or Cu (Co standard)

X-ray tube voltage: 30kV

X-ray tube power: 10W

Data Storage: 40 Gb - Ruggedized internal hard drive

Wireless Connectivity: 802.11 b/g for remote control from web browser

Operating Temperature: -10°C to 35°C

Weight: 14.5 kg with four batteries

Size: 48.5 x 39.2 x 19.2 cm (19.1 x 15.4 x 7.6 in)

Enclosure: IP67, MIL C-4150J rugged case

Field autonomy: ~ 4 hours (hot swap batteries)



Distributed exclusively by Innov-X Systems inc.



Terra



Self contained X-ray Diffraction / X-ray Fluorescence instrument



Field portable X-ray Diffraction/X-ray Fluorescence



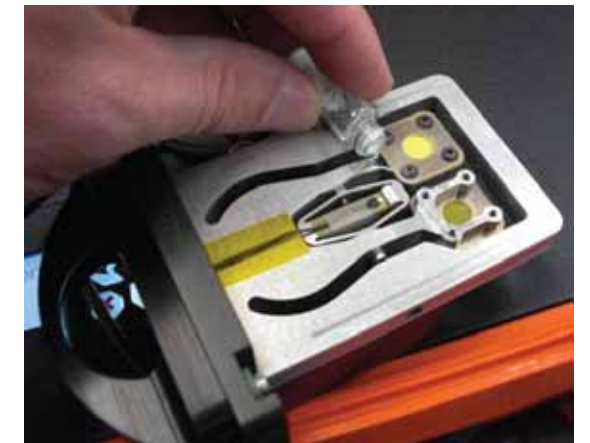
Patented technology from NASA & inXitu

Born from the desire to perform X-ray diffraction experiments on the Mars Science Laboratory (MSL), the inXitu team of engineers have captured this revolutionary technology for earthbound applications in Terra, the world's first field portable combined XRD/XRF instrument. Licensed from the National Aeronautics and Space Administration under patent 7,113,265 as well as utilizing inXitu's own patents, Terra brings to life a new way of performing X-ray diffraction and X-ray fluorescence measurements. With its unique powder handling system combined with no mechanical goniometers or complicated moving parts, Terra is well suited for those applications where field portability and/or ease of use is at issue.

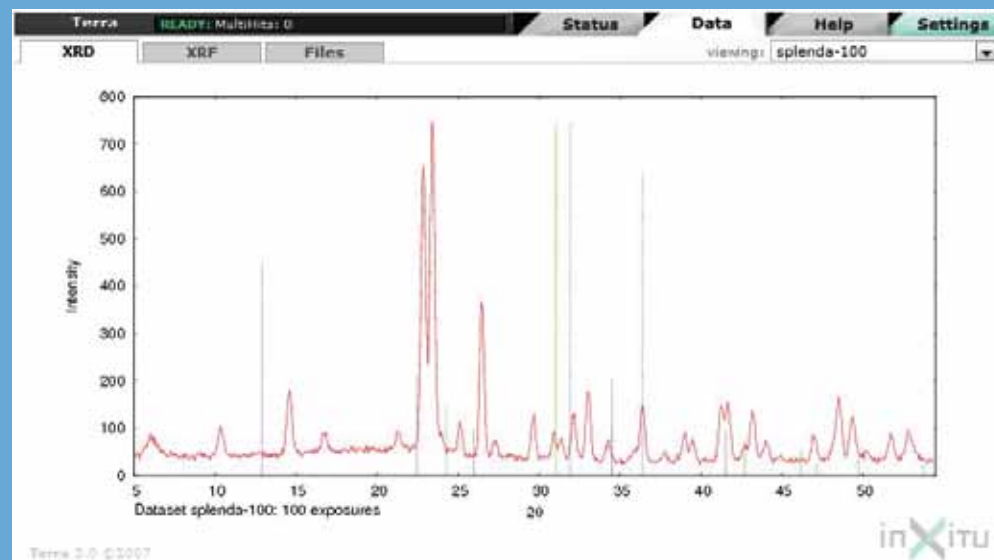
Using a specifically developed direct excitation charge coupled device (CCD) "camera", Terra is able to collect X-ray photon data for both X-ray diffraction and X-ray fluorescence simultaneously. This is the result of the integrated camera's ability to detect both photon position and photon energy at the same time. With energy resolution of ~200 eV (5.9 KeV), Terra makes XRF analysis as simple as viewing the software spectrum display.

Easy sample preparation

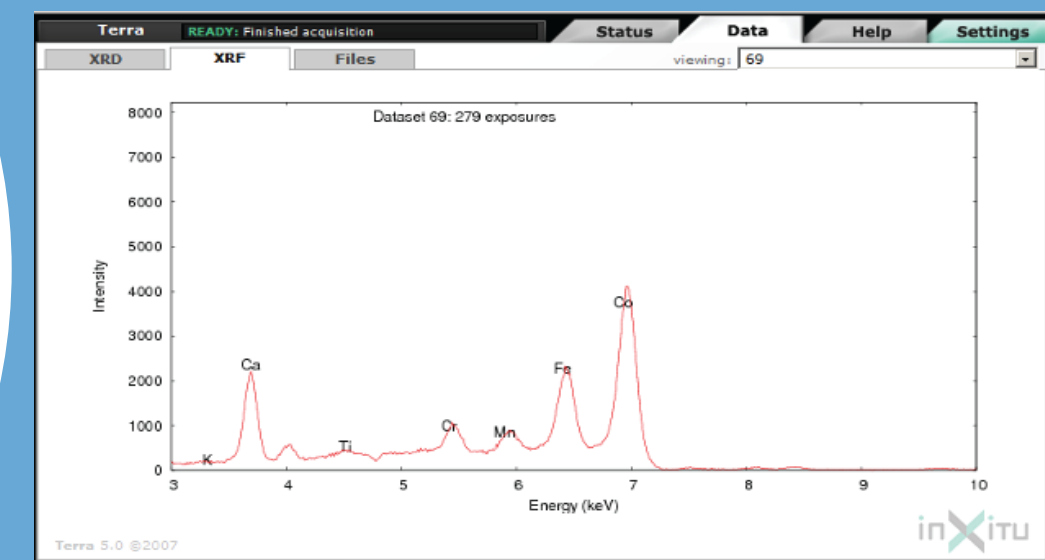
Typically, X-ray diffraction experiments require a finely ground sample which is then pressed into a pellet. This requirement is formed by the need to ensure sufficient random orientation of the crystals in the sample. Terra introduces a patented new way of addressing this issue. With only 15mg of sample, Terra convects the sample with its integrated sample vibration chamber. By doing so, Terra is able to present all different orientations of the crystal structure to the instrument optics. This results in a superb X-ray diffraction pattern, virtually free of problematic preferred orientation effects found using more classic preparation methods.



X-ray diffraction data



X-ray fluorescence data

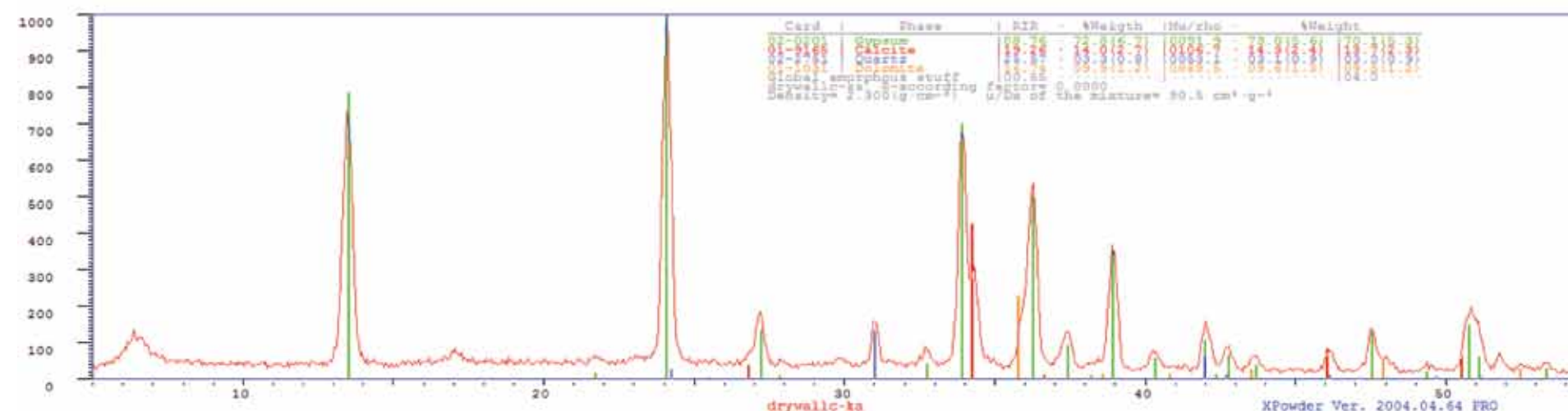


Search/match & XRD quantitative analysis software included

Terra is shipped with the necessary software (XPowder) for processing the resulting X-ray diffraction data. This includes the AMSCD mineral database. Should the user wish, XPowder provides the ability to use the ICDD Powder Diffraction Files (PDF).

For quantitative analysis, XPowder comes complete with Relative Intensity Ratio (RIR) quantitative analysis methods as well as full pattern analysis tools.

Further, Terra provides XRD pattern data in a variety of file formats making XRD pattern interpretation in other third party programs easy and available.



Terra operates off software embedded in the unit itself. The user accesses the operating system through a wireless connection (802.11 b/g). This unique method of operation allows for a wide degree of flexibility in controlling the instrument and subsequent data handling.