Malvern Panalytical
a spectris company

AERIS
RESEARCH EDITION

REDEFINING BENCHTOP XRD

SURPRISINGLY **INTUITIVE**

Meet the Research edition of Aeris – Malvern Panalytical's easy-to-operate and user-friendly benchtop X-ray diffractometer. With its intuitive operation, Aeris makes X-ray diffraction so simple that it is accessible for everyone. The unique touch screen user interface lets you proceed effortlessly through the measurement process of your samples.

The Research edition of Aeris is your companion for quick scans in the laboratory. It can easily be placed on a desk, does not need much space and only a single-phase power supply. Even inexperienced students can easily get started with any X-ray diffraction analysis. They do not have to invest time in a lengthy introduction or wait for measurement time on an expensive instrument. What is more, Aeris' 2-dimensional X-ray diffraction capabilities are ideal for teaching the fundamentals of XRD.

AN **EASY** TOUCH

Place sample and enter sample information

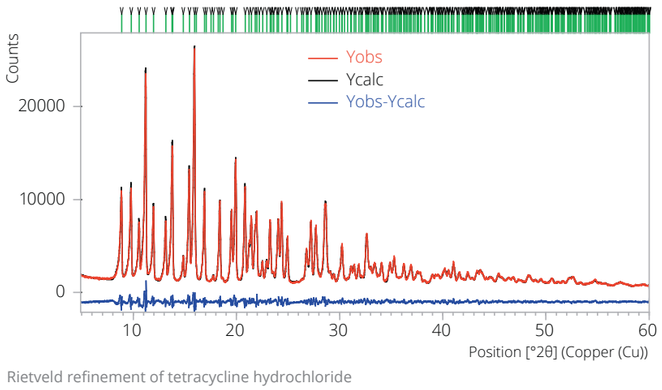
Select measurement program and hit start

OUTPERFORMING EXPECTATIONS

The Research edition of Aeris is your workhorse for rapid phase identification and Rietveld analysis of powder samples. The instrument provides fast, reliable and accurate materials analysis solutions for all your needs. Thanks to the incorporation of technologies that have already proven their benefits on Malvern Panalytical's high-end systems, the Research edition of Aeris delivers data quality that was previously only possible with a full-size floor-standing system.

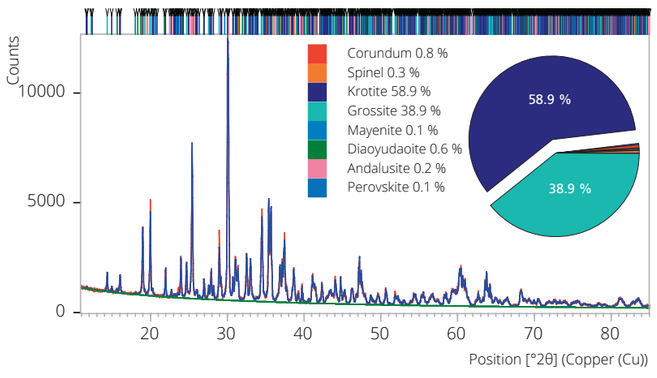
What about an achievable resolution of <0.04° 2θ on LaB_6? Or what about a 2θ linearity of well below ±0.02° 2θ? The Research edition of Aeris is very flexible and offers possibilities for all sorts of X-ray powder diffraction measurements. The instrument can accommodate various types of sample holders including non-ambient stages and sample changers. At the same time, the Research edition of Aeris is designed for low cost of ownership. The instrument does not need compressed air or cooling water, has low power consumption and it has a virtually unlimited lifetime of the X-ray tube.

Aeris can be used for Rietveld refinement on pharmaceuticals, for instance tetracycline hydrochloride



Rietveld refinement of tetracycline hydrochloride

Rietveld quantification of phase mixtures can be done reliably using Aeris.

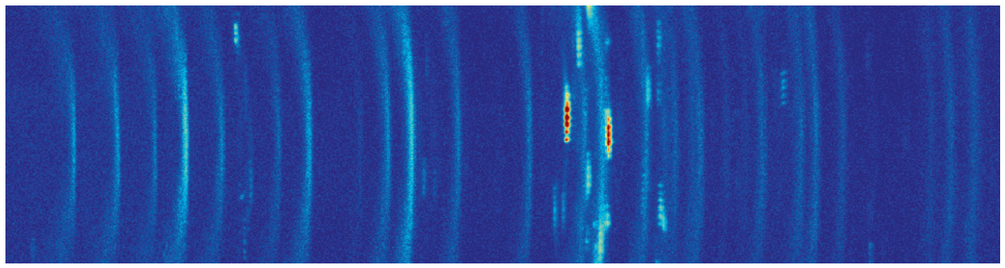


Rietveld refinement of high-temperature ceramic

2-DIMENSIONAL X-RAY DIFFRACTION

The Research edition of Aeris is the only benchtop X-ray diffractometer that can be delivered with an optional 2D Debye-Scherrer kit providing the possibility to perform basic 2D diffraction experiments. This kit is ideal for teaching the fundamentals of X-ray powder diffraction in a visual manner.

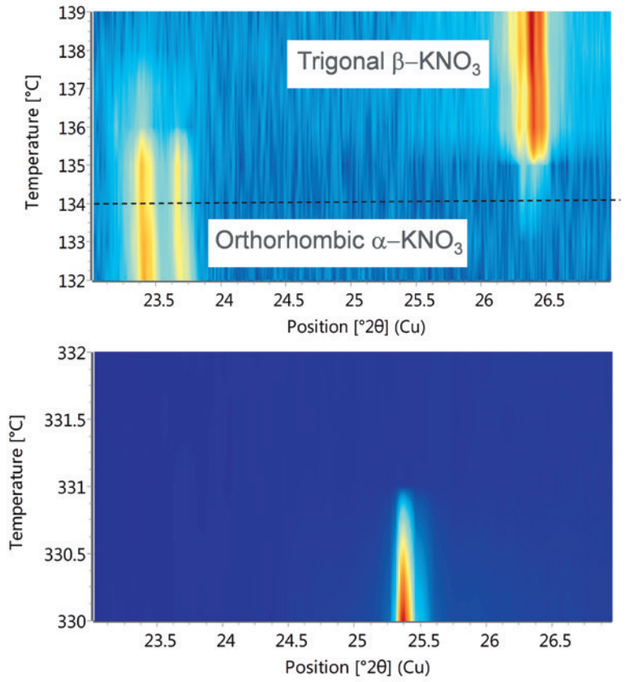
Furthermore, with the 2D Debye-Scherrer kit you can determine whether your sample contains randomly oriented crystallites (continuous rings), if it shows preferred orientation/texture or consists of larger crystallites resulting in bad particle statistics (spotty rings) during your diffraction measurement.



2D Debye-Scherrer rings of a mixture of silver behenate and tetracycline hydrochloride

NON-AMBIENT CAPABILITIES

With Aeris, *in situ* measurements as function of temperature are also available using BTS chambers from Anton Paar to study phase transitions.



(Top) Phase transformation from *α*- to *β*-polymorph of KNO_3 observed at ~ 134 °C
(Bottom) Melting of KNO_3 occurred at~ 331 °C
The data are courtesy of Anton Paar GmbH, Austria.

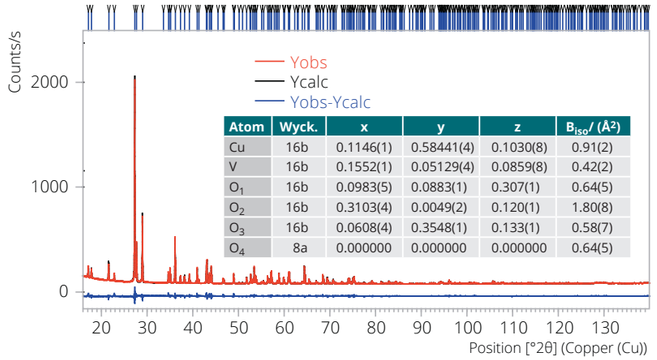
DATA FOR **YOUR RESEARCH**

Whatever project you are working on, the fast acquisition of phase information from your sample in question can be crucial for your research. Just collect X-ray diffraction data with Aeris and subsequently employ the HighScore suite to obtain a wealth of crystallographic information.

HighScore is Malvern Panalytical's most comprehensive powder diffraction software, supporting all known search-match databases for phase identification. This information can be used for:

- Polymorph screening
- Monitoring chemical reactions
- Easy identification of intermediates
- Geological exploration
- Monitoring of impurities
- Education

The HighScore Suite



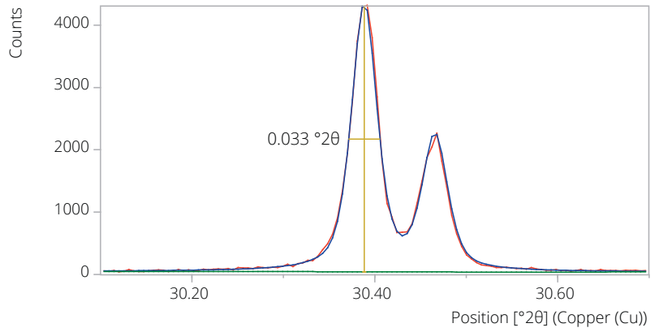
Atom	Wyck.	x	y	z	B_{iso}/ (Å²)
Cu	16b	0.1146(1)	0.58441(4)	0.1030(8)	0.91(2)
V	16b	0.1552(1)	0.05129(4)	0.0859(8)	0.42(2)
O_1	16b	0.0983(5)	0.0883(1)	0.307(1)	0.64(5)
O_2	16b	0.3103(4)	0.0049(2)	0.120(1)	1.80(8)
O_3	16b	0.0608(4)	0.3548(1)	0.133(1)	0.58(7)
O_4	8a	0.000000	0.000000	0.000000	0.64(5)

The example of blossite shows the excellent capabilities of Aeris to extract structural parameters including B_{iso} parameters.

Rietveld refinement of blossite (α-$Cu_2V_2O_7$) collected on Aeris diffractometer

BEST-IN-CLASS PERFORMANCE

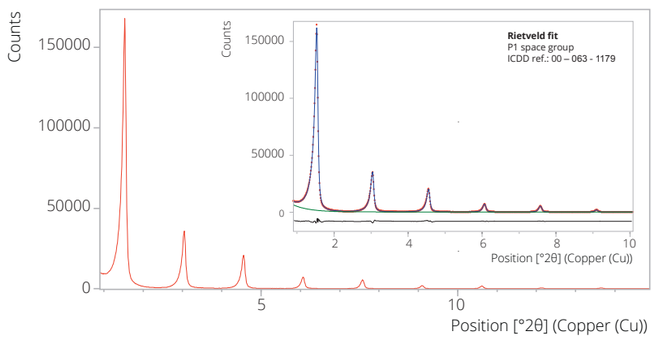
Resolution as never seen before on a benchtop X-ray diffractometer



LaB_6 measurement showing a full width half maximum value of <0.04° 2θ. These are values never seen on a benchtop XRD.

Diffraction measurement of LaB_6

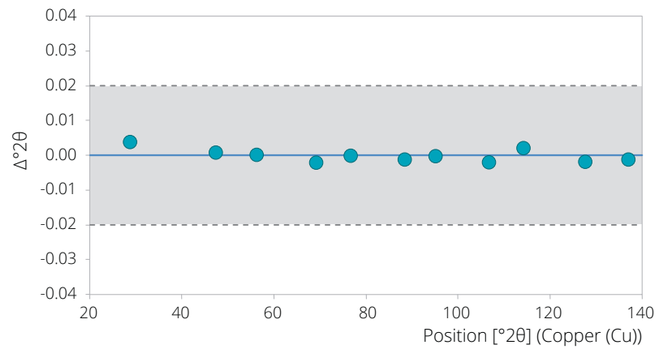
Excellent **low-angle performance**



Silver behenate showing the excellent low-angle performance of the system.

Diffractogram of silver behenate

Superior linearity



With a 2theta linearity well below ± 0.02° 2θ, the peak position accuracy of the Research edition of Aeris is the best on the XRD benchtop market.

2theta linearity graph of a silicon reference standard

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WHY CHOOSE **MALVERN PANALYTICAL**?

We are global leaders in materials characterization, creating superior, customer-focused solutions and services which supply tangible economic impact through chemical, physical and structural analysis.

Our aim is to help you develop better quality products and get them to market faster. Our solutions support excellence in research, and help maximize productivity and process efficiency.

Malvern Panalytical is part of Spectris, the productivity-enhancing instrumentation and controls company.

www.spectris.com

SERVICE & **SUPPORT**

Malvern Panalytical provides the global training, service and support you need to continuously drive your analytical processes at the highest level. We help you increase the return on your investment with us, and ensure that as your laboratory and analytical needs grow, we are there to support you.

Our worldwide team of specialists adds value to your business processes by ensuring applications expertise, rapid response and maximum instrument uptime.

- Local and remote support
- Full and flexible range of support agreements
- Compliance and validation support
- Onsite or classroom-based training courses
- e-Learning training courses and web seminars
- Sample and application consultancy

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