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K-Alpha X-ray photoelectron spectrometer (XPS) system

Fast, powerful and accessible chemical analysis for surface and thin film characterization



ThermoFisher
SCIENTIFIC

K-Alpha XPS spectrometer

Designed for performance and productivity

High-performance spectroscopy

The Thermo Scientific™ K-Alpha™ X-ray photoelectron spectrometer features a high-performance, micro-focusing X-ray monochromator that allows the operator to tune the analysis area to the feature of interest. The high-efficiency electron lens, hemispherical analyzer and multi-channel detector allow for excellent signal-to-noise performance, superb detectability, and rapid data acquisition.

Insulator analysis

The single-click charge compensation system on the Alpha spectrometer makes insulator analysis as easy as any other sample. The patented* dual-beam flood source is designed to prevent sample charging, using very low energy electrons and ions, which eliminates the need for charge referencing in most cases.

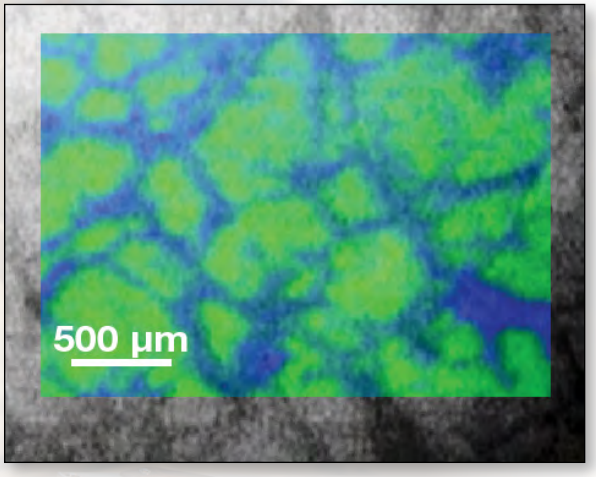
** GB Patent 2411763*

Chemical state imaging

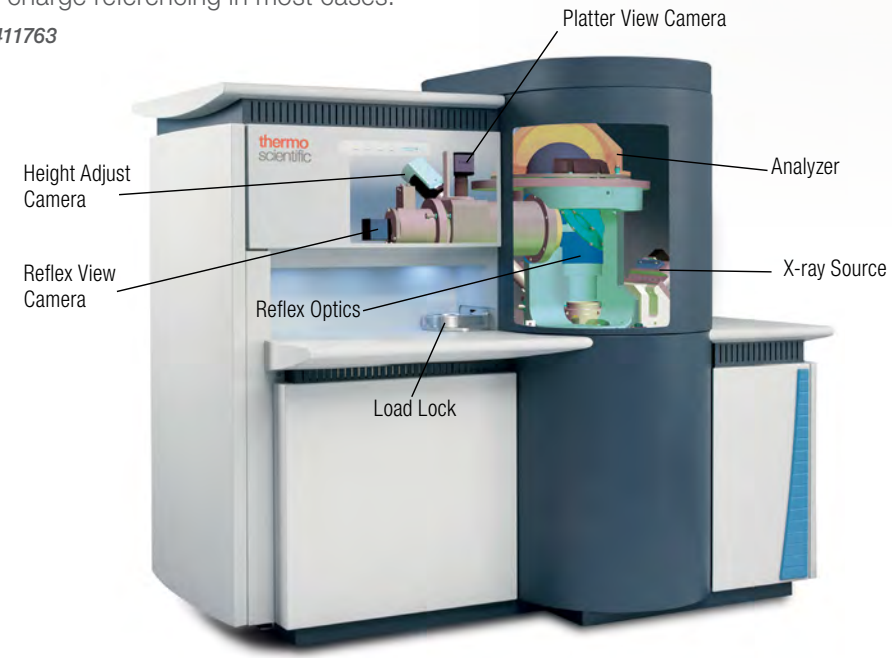
The K-Alpha spectrometer is capable of creating chemical state images of the surface, from investigating small features, to imaging samples sized as large as the stage platen itself. The unique optical viewing system now includes Thermo Scientific™ SnapMap™ capability, adding rapid XPS imaging for feature alignment and analysis.

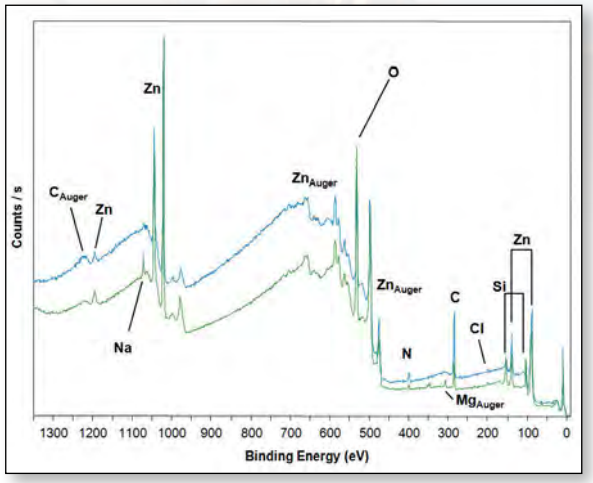
Depth profiling

The K-Alpha spectrometer is built to go beyond the surface with the EX06 ion source. Automated source optimization and automated gas handling ensure excellent performance and experimental reproducibility.



K-Alpha atomic concentration image of organometallic matrix on glass



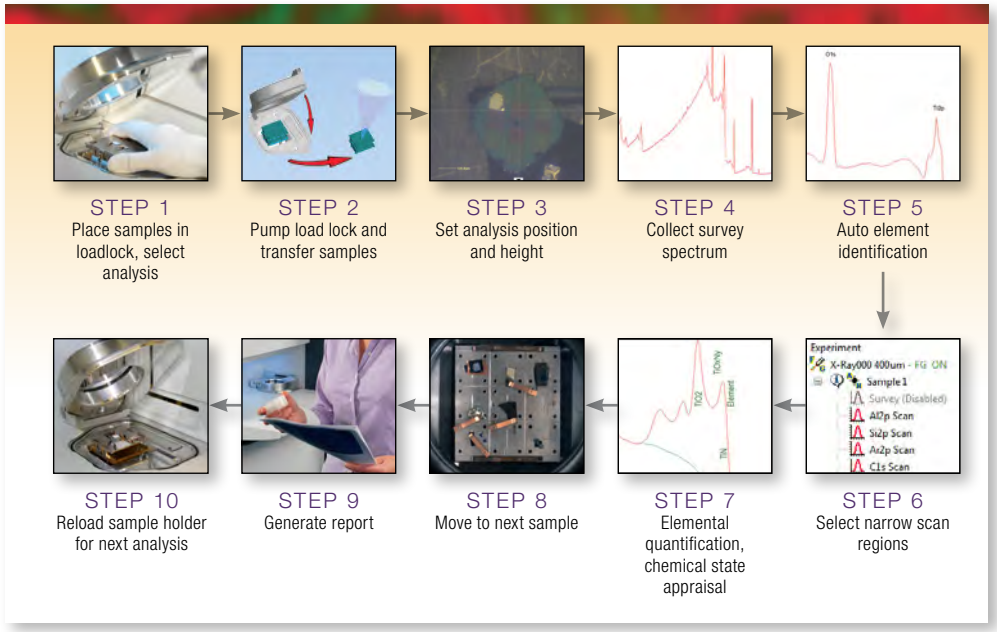


Survey spectra from blue and green phases in the image

Making research routine

Precise results, quickly and efficiently

The K-Alpha spectrometer bridges the requirements for both research and routine XPS analysis. The cutting-edge performance of the system makes the spectrometer ideally suited to creating world-class data in a busy R&D environment. Intuitive instrument operation, guided by the Thermo Scientific™ Avantage™ data system, makes it possible to put the K-Alpha spectrometer into a multi-user, shared facility, allowing operators of all skill levels to add surface analysis to their materials analysis portfolio.



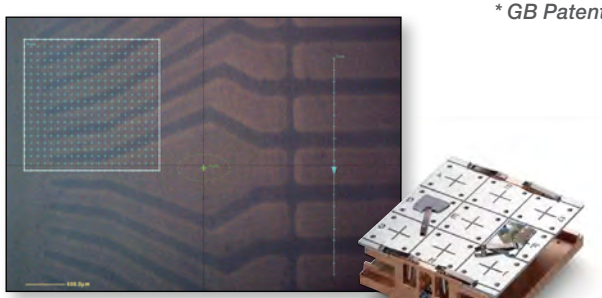
Calibration

An XPS instrument is only as good as its calibration. The K-Alpha spectrometer is supplied with the necessary standards for calibration, permanently mounted inside the analysis chamber. A single button press in the software, and the K-Alpha system will self-calibrate in minutes, ensuring confidence in the quality of your data.

Sample navigation

Three cameras provide an unmatched view of the sample. The patented* reflex optics give the ultimate confidence in the analysis position, the second camera in the analysis chamber makes alignment fast and intuitive, and the stored image from the load-lock camera moves you quickly from sample-to-sample.

** GB Patent 2428868*



The K-Alpha XPS Reflex View of a sample in the analysis position



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K-Alpha spectrometer configuration

Analyzer
- 180° double focusing hemispherical analyzer
- High-efficiency electron transfer lens
- 128-channel detector

X-ray Source
- Al Kα micro-focused monochromator
- Variable spot size (50–400 µm in 5 µm steps)
- High-performance with low power (maximum 72W)

Charge Compensation
- Dual-beam source
- Ultra-low energy co-axial electron and Ar^+ ion beam

EX06 Ion Gun
- Energy range 200 eV to 4 keV

Sample Handling
- 4-axis sample stage
- 60 × 60 mm sample area
- 20 mm maximum sample thickness

Vacuum System
- Two 260 l/s turbo molecular pumps
- Auto-firing, 3 filament TSP

Software
- Avantage software including offline data processing

Options
- Tilt module for ARXPS
- Vacuum transfer module for air-sensitive samples
- Sample bias module for work function measurements
- Interface to connect to glove box



Find out more at **thermofisher.com/kalpha**

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