Atomic Absorption. Redefined.

contrAA® 800

High-Resolution Continuum Source Atomic Absorption Spectrometry

analytikjena
An Endress+Hauser Company

contrAA® 800 Series

As a link between standard AAS instruments and ICP-OES spectrometers contrAA® 800 combines the best of two worlds: fast sequential and simultaneous multi-element analysis, ease of handling and manageable costs.

More than a decade ago, the contrAA® High-Resolution Continuum Source AAS (HR-CS AAS) revolutionized the world of atomic absorption spectrometry. Today, it is a well-established standard in laboratories around the world – the right time for Analytik Jena to take a major step ahead. With contrAA® 800 the technology leader presents an instrument that redefines the demands of users in respect of precision and performance.

contrAA® Features:

- **Multi Element:**
  One light source for fast sequential and simultaneous multi-element analysis
- **High-Resolution Optics:**
  Interference-free analysis and highest precision
- **HD Spectrum:**
  High-resolution 3D spectra display for detailed spectral information
- **Dynamic Mode:**
  Extended measurement range of up to 5 orders of magnitude

contrAA® 800 F
HR-CS AAS for flame and hydride technology

contrAA® 800 G
HR-CS AAS for graphite furnace technology, including solid AA® and HydrEA

contrAA® 800 D
The most versatile system for HR-CS AAS offering flame, hydride and graphite furnace technology, including solid AA® and HydrEA.

contrAA® 800

Atomic Absorption. Redefined.

We Translate Innovation into Convenience

Innovation is not an end in itself. It will be judged by the effective benefits it offers to users. With the contrAA® 800 Analytik Jena developed a device that perfectly matches the requirements of its users. A device born from practical experience: from laboratory experts for laboratory experts.

We designed the contrAA® 800 as compact and as easy as possible. Our patented HR-CS technology significantly shortens time-consuming tasks, such as sample preparation, and permits addressing a maximum of different analysis tasks with a minimum of time. This is made possible by the continuous emission spectrum of the Xenon short arc lamp, which allows multi-element analysis without changing lamps.

Accurate results in record time

The daily lab is tightly scheduled. Those working here have little time – therefore, they depend on robust, high-performance equipment that provides accurate results in routine operation as well as in special applications. Thanks to the Xenon short arc lamp and a fast high-resolution spectro-meter with CCD detector, the sample throughput of contrAA® 800 for multi-element analyses – including screening analysis of unknown samples – increases dramatically, compared to traditional AAS. With the new generation of contrAA® it meets the level of simultaneous techniques.

Matching features for every type of user

A comfortable device should adapt itself to the various demands of its user – not vice versa. The contrAA® 800 convinces researchers and routine users alike. While the former are convinced by the exceptional wide range of application and the numerous analytical capabilities, the latter are impressed by the high level of automation, the clear presentation of results and a high sample throughput.

Seven Reasons Why contrAA® 800 Should Be Part of Every Lab

01

Comfortable handling

Thanks to the continuous emission spectrum of the Xenon short arc lamp, it is easy to **analyze any element and any wavelength by simple software selection.** With the contrAA® 800, changing and optimizing lamps for AAS is a matter of the past. The automatic atomizer change further simplifies handling. On the whole, the contrAA® 800 is significantly easier to use than instruments using ICP-OES technology, for example.

02

Maximum flexibility

The Dynamic Mode, already familiar from other Analytik Jena devices, allows unrivaled flexibility in analyzing absorption signals. The technology provides options for automatic or manual adjustment of the working range of the instrument to the concentrations present in the sample. The Dynamic Mode allows a calibration over a concentration range of up to five orders of magnitude, thus providing detection of ultra-traces and major elements in a sample with a single method.

03

Accelerated processes

contrAA® 800 means sequential and simultaneous multi-element analysis with an **extremely high sample throughput.** Furthermore, the **automatically optimized drying process** contributes to an efficient and robust analysis. Since no sample dilution is required for many applications, the effort of **sample preparation is reduced to a minimum.**

04

Best precision

The significantly higher light intensity of the Xenon short arc lamp in comparison to conventional light sources improves the signal-to-noise ratio significantly, provides **improved detection limits and better precision.** The CCD array detector provides **high-resolution absorption spectra.** Atomic absorption lines are displayed in their natural shape and width. The 3D spectrum display simplifies method development and is useful for identifying and eliminating process errors or interference.

05

Low space requirements

The contrAA® 800 convinces with a modern and **extremely compact design.** Compared to the previous model, the footprint has been reduced by one third. As contrAA® 800 allows the detection of all elements with a single lamp, there is **no need for the provision of different lamp types.**

06

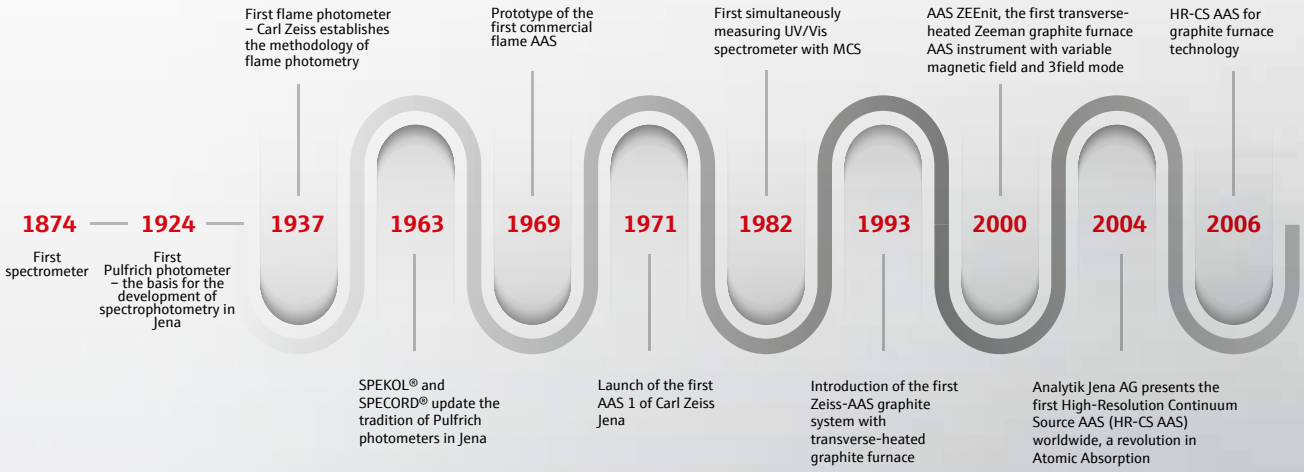
Long service life

Like all Analytik Jena devices the contrAA® 800 scores with a long service life. The Xenon short arc lamp has proved a genuine long runner in practice in the years since the market launch of HR-CS AAS technology and achieves a service life far above average. The optional **automated purge of the optical system allows operation even under toughest laboratory conditions.**

07

Decades of experience

Atomic absorption spectrometry is a core competence of Analytik Jena. When choosing contrAA® 800 today, you buy an instrument which incorporates the experience of entire generations of researchers and users. Due to numerous innovations over the past decades, Analytik Jena has acquired global leadership in this technology segment. This experience-based advantage is immediately noticeable to any user.



Access All Areas:
A Device for All User Types

The contrAA® 800 is an all-rounder, equally meeting the requirements of the most varied users. For researchers, the instrument provides an option to also implement "exotic" analyses beyond the daily routine. Routine users value its reliably strong performance.

contrAA® 800 in routine analysis

- Sequential and simultaneous multi-element analysis
- Higher sample throughput compared to conventional AAS thanks to multi-element analysis
- Extended working range, reduced sample preparation
- All elements can be analyzed with a single lamp
- Lower operating costs
- Easier to operate than ICP-OES
- High resolution avoids interferences
- Better overview applying screening methods
- Extensive accessories for a high degree of automation

contrAA® 800 in research

- Various background correction methods
- „Look under the Line" – Flexible spectrum evaluation, individual spectrum correction
- 3D Spectroscopy – Simplified method development
- In addition to metals and metalloids also non-metals can be determined qualitatively and quantitatively (eg., Sulfur, halogens)
- More than one hundred times higher resolution than traditional AAS monochromators
- Maximum flexibility: any wavelength is accessible – also for non-standard applications
- Simultaneous measurements are possible

"Many discussions with users worldwide, including my personal experience in the laboratory, demonstrated that the contrAA® is superior to common AAS technology in every aspect. My recommendation for everybody dealing with atomic spectrometry: See it for yourself."

Dipl.-Ing. Oliver Büttel, product manager for optical spectroscopy

Superior Technology – Excellent Results

From the continuum source, via the high-resolution Echelle double monochromator, to the CCD detector – Analytik Jena's lead in technology is apparent in each individual component of the contrAA® 800. For only the best technology meets the quality requirements of our users.

Already the first instruments in the contrAA® series exceeded the performance of standard atomic absorption spectrometers in all parameters. contrAA® turns AAS into a real multi-element technology and offers a flexibility hitherto unknown in analysis. With the contrAA® 800 it has been possible to make further decisive detailed improvements to the technology used and valued in routine analysis, research and science.

Inspiration from laboratory practice implemented

With the further development of our classic instrument, new ideas from our experts were complemented with valuable suggestions from within the field. For example, the revised high-performance optics offer even more stability and lowest noise for even lower detection limits and highest precision. A high-resolution spectrometer with CCD detector maps a high-resolution absorption spectrum for every sample and thus permits insights with a hitherto unknown level of detail. The automatic atomizer change and two-dimensional atomizer alignment are also new.

Multi Element

The contrAA® 800 is ready to analyze any element and any wavelength at any time – and without lamp exchange. This is achieved by the Xenon short arc lamp emitting a continuous spectrum.

Significantly higher light intensity

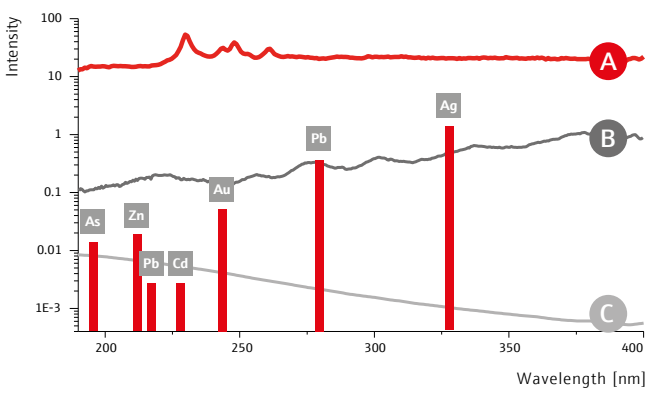
The light intensity of the Xenon short arc lamp is significantly higher than with traditional light sources. It provides an excellent signal-to-noise ratio resulting in improved detection limits. Any element can be analyzed with a single lamp, including the analysis of non-metals/molecules.

Easy and efficient handling

Thanks to a new water-cooled protective housing the Xenon short arc lamp can easily be replaced by the user. Since only one lamp for the analysis of all elements is required, the replacement costs compared to HCL instruments are significantly lower.

Multi Element – Your benefits

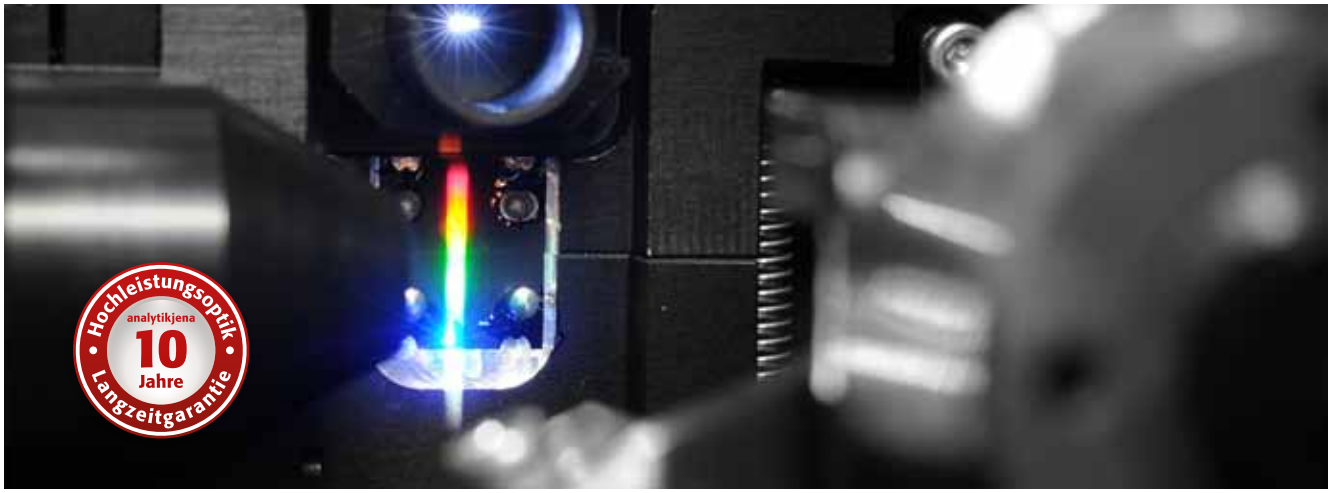
- Multi-element capability by full spectral coverage (185-900 nm)
- A single light source for all elements
- Use of secondary wavelengths
- Extended application range: determination of non-metals and molecules
- No alignment or optimization of the lamp required
- Low operating costs
- Increased productivity



A Analytik Jena Xenon short arc lamp, 300 W, Hot-Spot mode
B Conventional Xenon lamp, 300 W, diffuse mode
C AAS Deuterium lamp

High-Resolution Optics

Due to the high-resolution spectrometer and a CCD detector contrAA® 800 produces a highly resolved absorption spectrum for each sample.

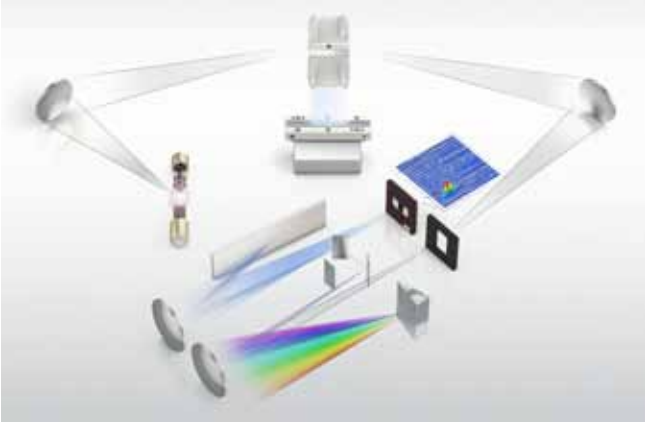


Atomic absorption lines in their natural shape and width
At a resolution more than one hundred times higher than traditional AAS monochromators, atomic absorption lines are displayed in their natural shape and width. This greatly reduces the risk of interferences from other atomic and molecular absorption structures.

High stability assures precision
Highly resolved spectra provide comprehensive and extremely detailed information about the sample. A three-dimensional spectrum display simplifies method development and makes evaluation child's play.

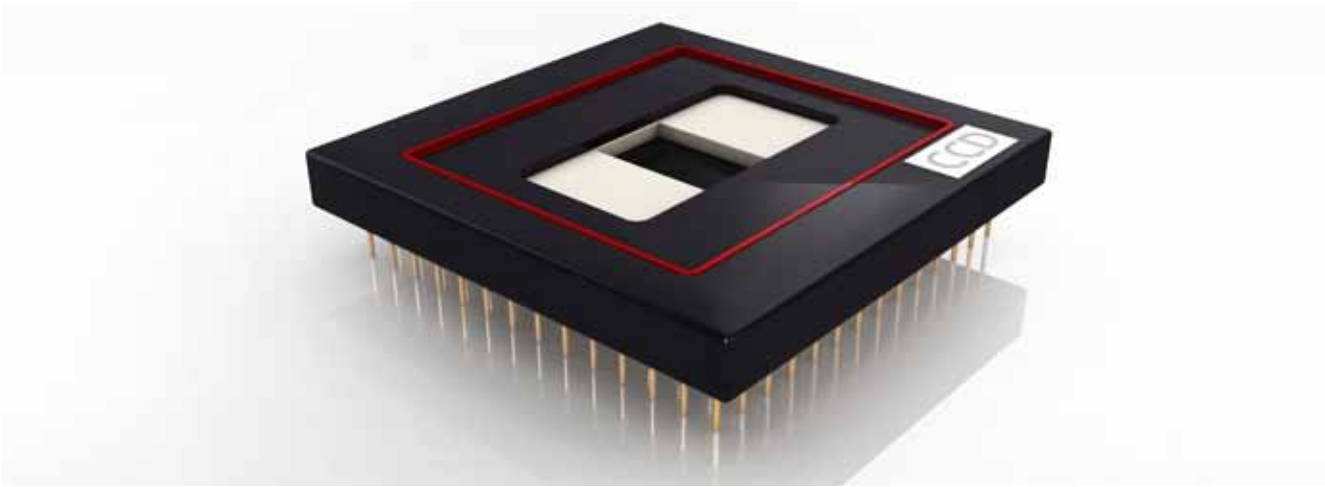
High-Resolution Optics – Your benefits

- High resolution – less interferences, more details
- Improved method robustness
- Outstanding wavelength accuracy and repeatability
- High light throughput – excellent signal-to-noise ratio – excellent limits of detection
- Exceptional long-term stability



HD Spectrum

Highly resolved spectra provide comprehensive and extremely detailed information about the sample. A three-dimensional spectrum display simplifies method development and makes evaluation child's play.



Visual display strengthens confidence in results

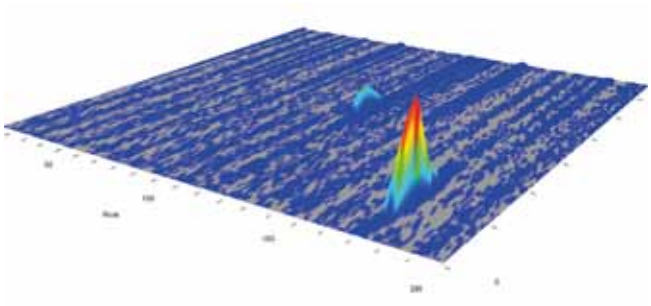
The 3D spectrum display allows for a visual proof of the correct evaluation of the absorption lines and their spectral background. It provides a tool to check the absence of interferences, thus assuring a correct measurement. This strengthens confidence in results!

Simultaneous quantitative multi element evaluation

The spectrum provides more information than about a single element. If required, other elements present in the sample can be quantified simultaneously. Modern software tools facilitate data evaluation and method development – e.g. the automatic background correction (ABC) or the simultaneous Correction of Spectral Interference (CSI).

HD Spectrum – Your benefits

- Qualitative identification of all sample elements
- Simultaneous quantitative multi-element evaluation
- 2D/3D Spectrum simplifies method development
- Line identification tool
- Interference warning
- Simultaneous correction of background and spectral interferences



3D spectrum after automatic background correction

Dynamic Mode

The Dynamic Mode allows an automatic or manual adjustment of the dynamic working range of the instrument according to the concentrations encountered in samples.

The sample concentration sets the working range

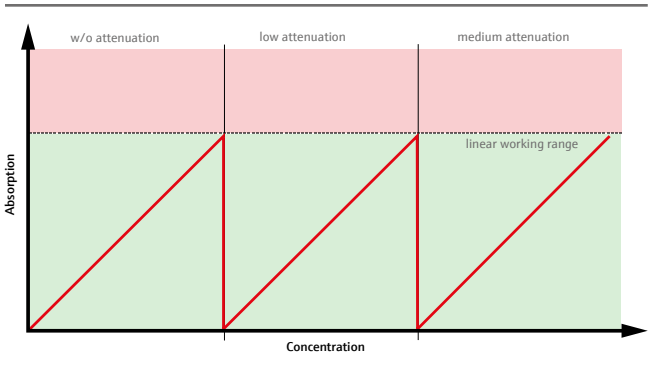
In traditional AAS the instrument working range defines the analysis process. Whereas contrAA® 800 with Dynamic Mode adapts itself to the working range the sample dictates – this makes multiple sample dilutions a matter of the past. An adaptation to higher concentrations is possible even if no secondary wavelengths are available.

Dynamic Mode – Your benefits

- Extended working range
- Connection of calibrations for the determination of ultra-trace up to major concentrations
- Continuous calibration across 5 orders of magnitude
- Simplified sample preparation – determination of all elements from the same solution

Measure ultra-traces and major elements in one sample with a single method

The Dynamic Mode enables a wide-range calibration over a concentration range of up to five orders of magnitude, allowing measurements of ultra-trace- and major elements in the same sample with a single method. Thus contrAA® offers a dynamic range similar to that of ICP-OES instruments.



Via electronic attenuation of the signal the linear measurement range will not be left even at high concentrations.

Optimized Accessories – Extended Application Range

Whether autosampler, Scraper or hydride system, an extensive range of accessories expands the fields of application of contrAA® 800 significantly and facilitates lab work.

AS-F and AS-FD – Autosamplers for flame mode, hydride techniques and atomic fluorescence

The autosamplers AS-F and AS-FD are integrated into the overall concept of the basic instruments and enable a fully automatic routine analysis. If concentrations exceed the calibration range, an automatic clean control prevents contamination of the subsequent samples. AS-FD allows fully automatic sample dilution down to a factor of 1:800.

Modular Mercury/Hydride Systems (HS)

The hydride systems for contrAA® 800 allow the selective analysis of mercury and hydride-forming elements. They are based on a modular concept and can easily be adapted to changing requirements, e.g. adding an amalgamation module, or converting a batch into a flow injection system. The systems are fully compliant with all applicable DIN, ISO, EPA and ASTM methods for mercury and hydride analysis

SSA 600 – automatic solid sampler with integrated microbalance for solid AA®

SSA 600 provides the prerequisites for the application of solid AA® for direct solid AAS in routine analysis. A specially optimized sample carrier can be used for many kinds of solids and ensures reliable transfer processes in sample feeding and optimum atomizing conditions in the solid tube. Not only transport of the loaded sample carrier into the furnace but also weighing with the fully integrated microbalance is completely automated. An optional liquid dosing unit allows a calibration with liquid standards and the automatic addition of modifiers.

Scraper

The intelligent cleaning device for the burner head simplifies working with the acetylene-/nitrous oxide flame. It automatically cleans the slot before each measurement and in standby mode. Once activated in the software the Scraper guarantees a continuous and reproducible measuring cycle in routine analysis.

contrAA® 800 with AS-FD and hydride system

SSA 600 for fully automated solid AA®

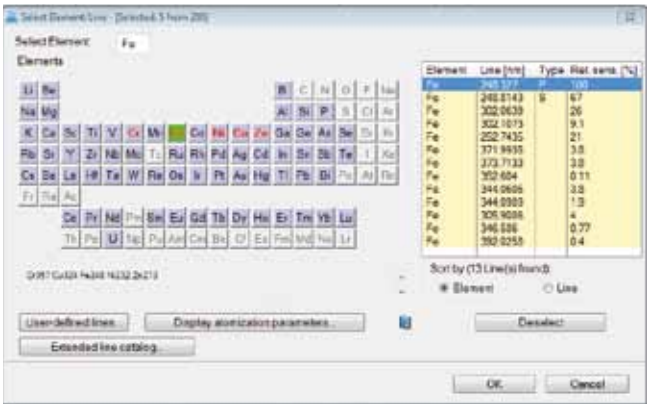
ASpect CS – Pre-programmed Satisfaction

The contrAA® 800 develops its full potential with the software package ASpect CS. It opens up a multitude of options for control, method development, automation and data storage.

ASpect CS has been specifically developed for multi-element analysis with the contrAA® – based on decades of experience and customer suggestions. Thanks to its intelligent design, the software is intuitive in operation: The creation of analytical methods for one or several elements is thus easier than ever before. A noticeable relief is also provided by the automatic optimization routines, which find the optimum measuring conditions for every application, as well as the comprehensive quality control functions. In conjunction with the self-check system, they guarantee reliable results at any time.

Substantial improvements

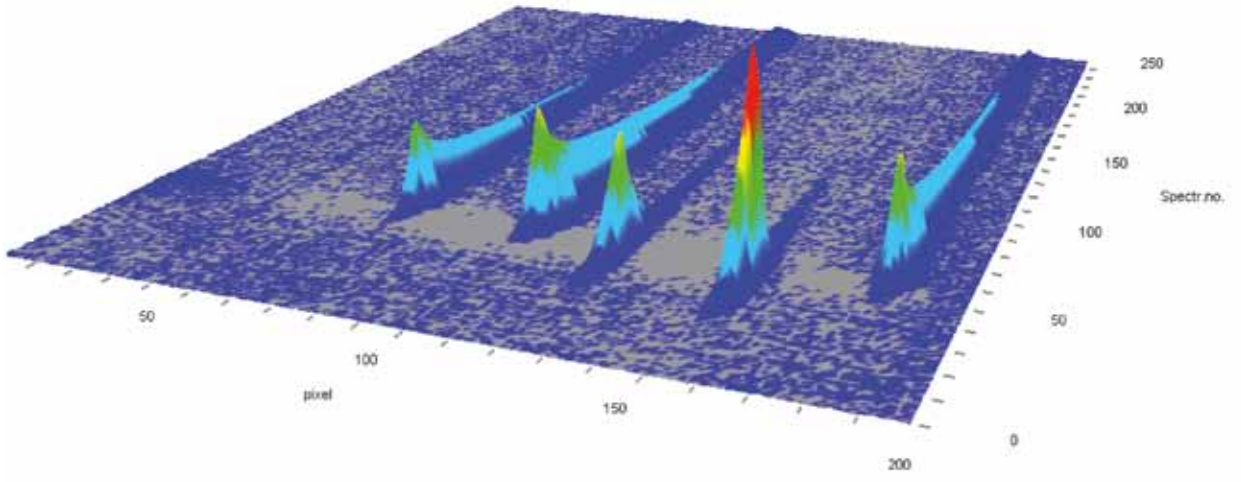
During the development of the contrAA® 800 the corresponding operating software has also been optimized and extended by numerous functions. Several element lines in the spectrum window can now be analyzed simultaneously in a single atomizing cycle. The integration ranges of the individual lines can also be freely defined, including the combination of several lines of an element. A new method for the simple, automatic correction of complex structured backgrounds has also been implemented. The correction of spectral interferences through partial or direct line overlap has been further optimized and is now even more flexible.



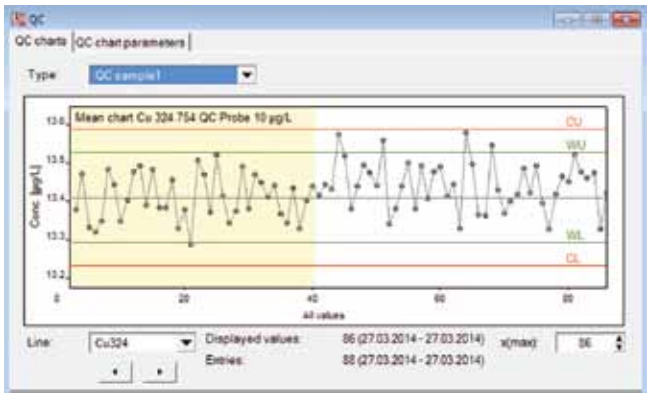
Selection of analysis wavelength in ASpect CS

Results that are always trackable

ASpect CS saves all relevant data for a measuring process in a data record protected against manipulation. This includes e.g. method parameters, raw data, spectra, results and information such as sample ID, sample weight/volume and dilution. You can track at any time, for example, how a specific result came about and initiate subsequent calculations where appropriate. ASpect CS meets all requirements of FDA 21 CFR Part 11.



3D spectrum of a sample with signals from different elements



Integrated quality assurance control chart

ASpect CS – high productivity and incredibly flexible analysis for greatest ease of operation:

- Simultaneous multi-element analysis
- Free definition of the integration range of each line
- New background correction method
- Improved correction of spectral interferences
- Easy creation of analytical methods for one or several elements
- Optimization routines for optimal measuring conditions
- Manipulation-protected data storage
- FDA 21 CFR Part 11 compliance

Analytik Jena – the technology leader in spectrometry

Optical Spectrometry

novAA® Series
Classical line source AAS with Dual Optics and Deuterium background correction.

contrAA® Series
High-Resolution Continuum Source AAS with simultaneous background correction for fast sequential and simultaneous multi-element analysis.

ZEEnit Series
Line source AAS with Deuterium and Zeeman background correction with third generation magnetic field control.

PlasmaQuant® PQ 9000 Series
High-Resolution Array ICP-OES with Dual View PLUS plasma observation for automated attenuation of axial and radial plasma views.

Mass Spectrometry

PlasmaQuant® MS Series
Bench-top ICP-MS with patented ion optics for unmatched sensitivity and robust plasma performance with only half the argon gas.

Sample Preparation

TOPwave®
Microwave digestion system with contactless pressure and temperature monitoring for all samples.

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High Resolution Continuum Source AAS (HR-CS AAS) was developed in cooperation between the Leibniz Institute for Analytical Sciences – ISAS – and Analytik Jena and is firmly established on the market with the contrAA® series of instruments.

Based on patented ISAS Technology

ISAS
Institute for Analytical Sciences

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