Tech Note
contrAA 800 – Side Pixel Evaluation

analytikjena
An Endress+Hauser Company

Unique line evaluation in AAS

Introduction

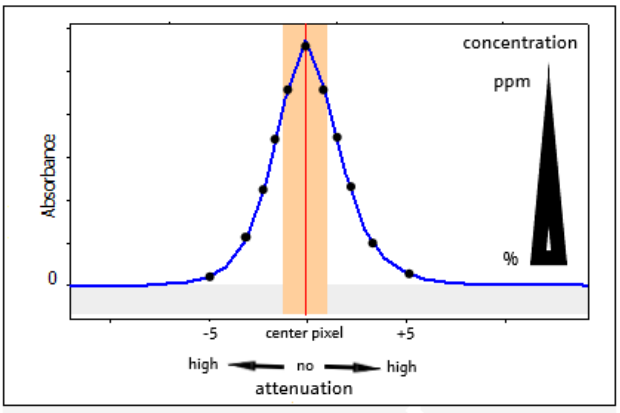
The contrAA 800 enables the fast-sequential measurement of several analytes out of one sample run. If elements are present in significantly different concentrations in a set of samples, the selection of suitable alternative lines can be challenging. A feature of the AspectCS software however allows to attenuate strong absorbance signals by measuring at the edges of the respective resonance line. Several attenuation steps are available, to customize the spectral evaluation for each analyte and application. Multiple dilutions of the samples are obsolete with this additional option for flexible signal evaluation, because the working range of the contrAA 800 can be adapted to the sample requirements. Even after the measurement, the resulted signal intensities can be adjusted.

Your Benefits

- adaptation of the concentration range
- flexible signal evaluation
- determination of trace and major elements in the same sample with just one method
- less dilution effort

Technical basics

The contrAA 800 with its unique Continuum Source (short arc xenon lamp) in combination with the high-resolution spectrometer (HR-CS-AAS) enables the use of alternative absorption lines with good precision. The different luminous efficacies of hollow cathode lamps are not an issue with the element-independent light generation of the contrAA 800.



Due to the high-resolution optics, the absorption signal is well resolved and detected by several pixel. The peak maximum is usually used for signal evaluation. However, high signals reasoned by a high concentration of the analyte, can be evaluated at the peak edge, which is equivalent to an attenuation of the signal. This unique AAS feature of the contrAA 800 series is the so-called side pixel evaluation.

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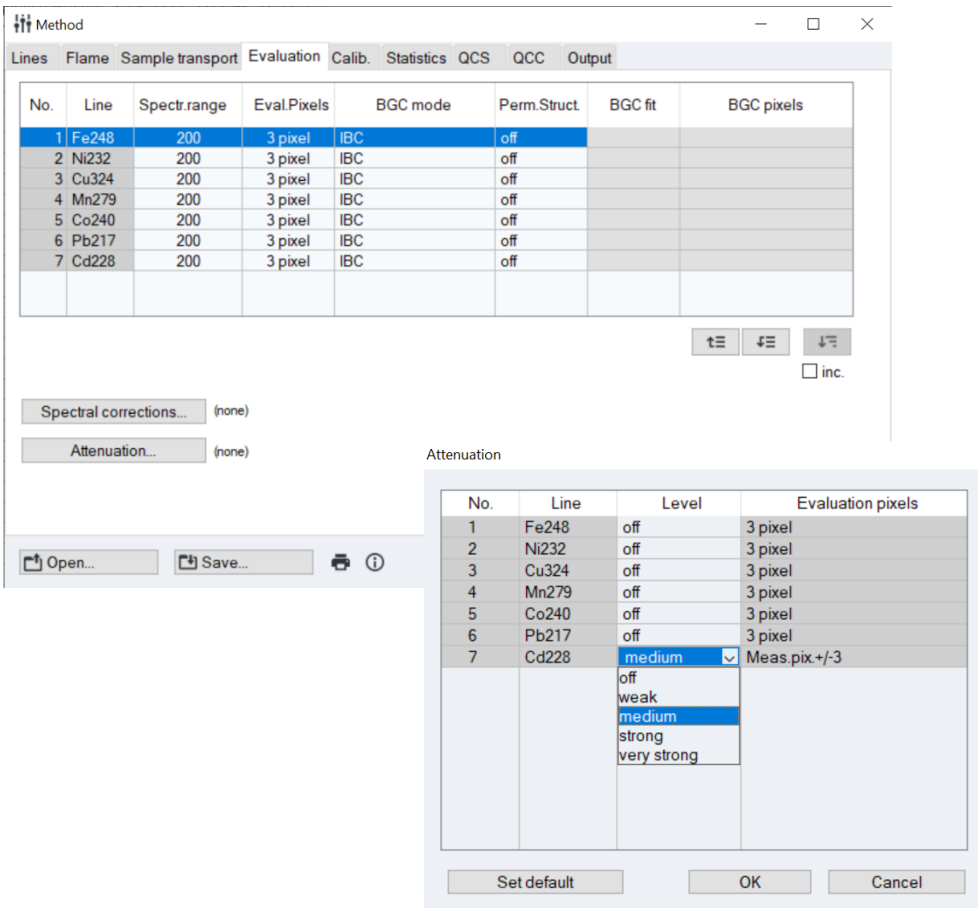
Software feature

The AspectCS software offers the possibility of the side pixel evaluation. In this case the intensity reduction of the signal is achieved by shifting the evaluation pixels from the center of the peak to the less sensitive edges. Thus, even high signal values can be evaluated with high sensibility. The free selection of the used evaluation area is provided by the used CCD detector chip with 200 photosensitive pixels. The further away the evaluation pixels are from the peak center, the stronger the signal reduction occurs. This adaptation of the signal evaluation is even available after the measurement.



Application example

The signal attenuation resulting from the adjustment of the readout pixels is illustrated on the example of the absorption line for zinc at 213 nm (table 1, pixels are marked in orange) This function can be used to create calibration functions that enable sensitive measurements over five orders of magnitude (0.05 – 500 mg/L Zn) in just one method and single measurement run.

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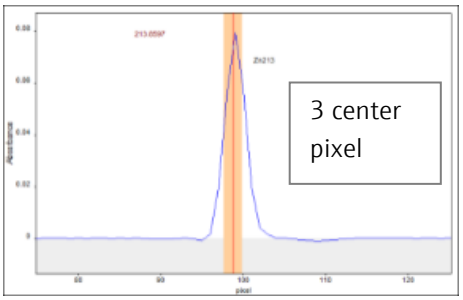
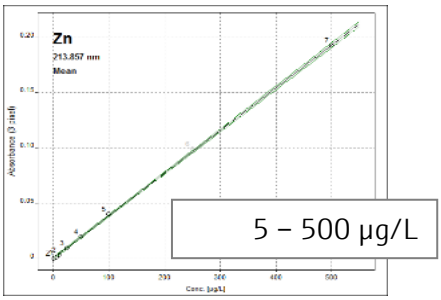
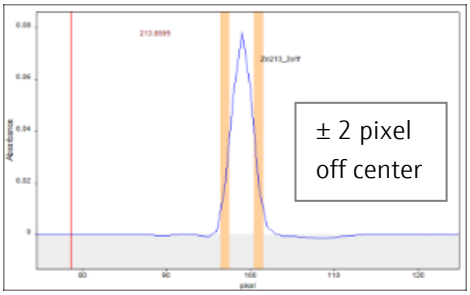
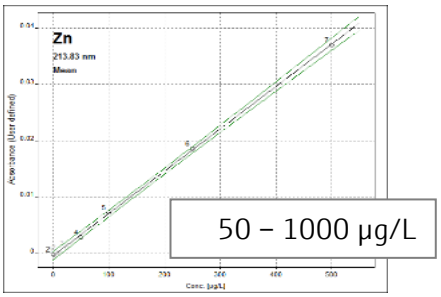
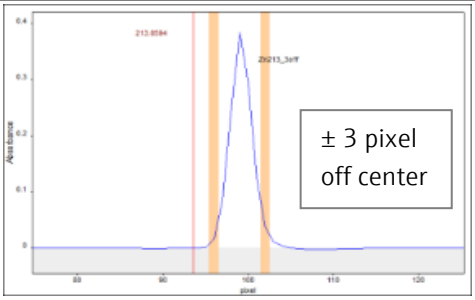
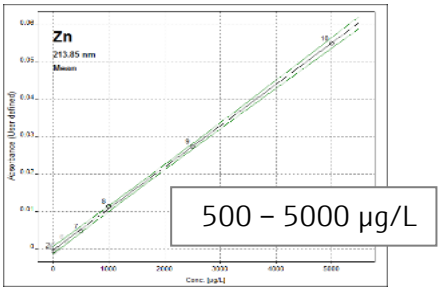
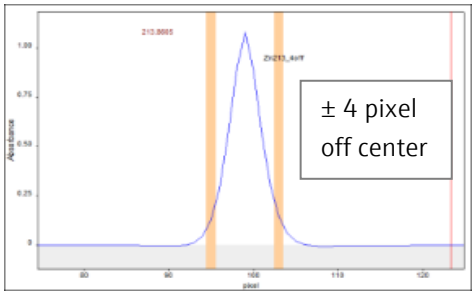
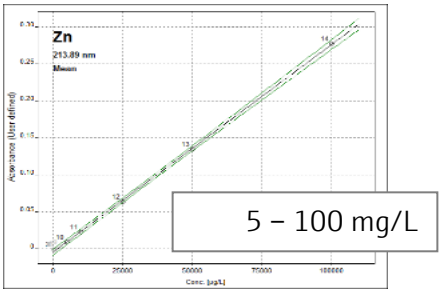
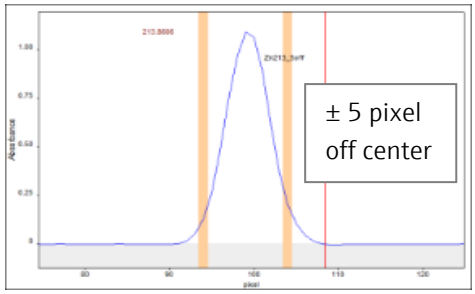
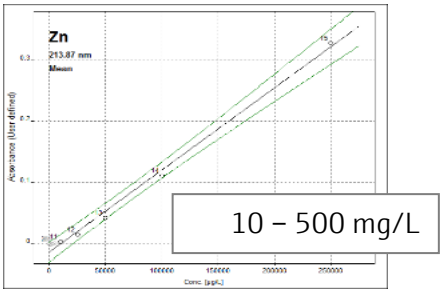
Table 1: Example of side pixel evaluation at Zn 213nm absorption line

	Used pixel for evaluation	Resulting concentration range
Without attenuation		
Weak attenuation		
Medium attenuation		
Strong attenuation		
Very strong attenuation		

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Summary

This unique feature of the contrAA 800 based on the high-resolution continuum source technique, where the spectral vicinity of the analysis line is included in the detection and recording. The ASpect CS software gives the experienced user the opportunity to customize the evaluation of the absorption signal. This results in a maximum of flexibility, a significantly expanded working range over five orders of magnitude and an analytical performance that can be optimized for the requirements of each application.

Reference: TechNote_AAS_0002_en

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