

# Fluorine Analysis With HR-CS MAS

## Fluorine Analysis Easy to Say, And Easy to Do!

For the first time, High-Resolution Continuum Source AAS technology (HR-CS AAS) also allows the determination of non-metals with an AAS instrument, the **contrAA**<sup>®</sup>. By converting the analytes into characteristic molecules, these can be determined by molecular absorption spectrometry (MAS). HR-CS MAS is a new, sensitive method for the analysis of the total content of fluorine in aqueous and organic solutions as well as directly in solids – independently of the bonding form of fluorine. Without laborious sample preparation, the total fluorine, both free and also organically or inorganically bound fluoride, is converted to the target molecule gallium fluoride (GaF) in the graphite furnace for subsequent spectrometric determination.

This means, for the first time, a simple, fast and reliable spectrometric method is available for fluorine determination in almost every matrix and over a wide concentration range. Graphite furnace HR-CS MAS is just as precise, robust and interference free as graphite furnace AAS and is not subject to any restrictions with regard to the pH value and the sample matrix, so that sample preparation is reduced to a minimum.

**HR-CS MAS – Molecular Absorption Spectrometry for the Determination of Non-Metals**  
Precise · Reproducible · High Degree of Automation · Simple Sample Preparation · Cost Effective

### **contrAA**<sup>®</sup> an Overview of HR-CS AAS:

- HR-CS AAS – one of the most reliable methods for the determination of trace elements
- One radiation source for all absorption lines in the range of 185–900 nm
- Extended applications: analysis of non-metals (halogens, sulfur ...)
- Highest resolution in order to avoid spectral interferences
- Representation of the absorption spectrum of the sample
- Simultaneous spectral background correction
- Use of correction spectra for the removal of spectral interference
- Higher quality of measurement results



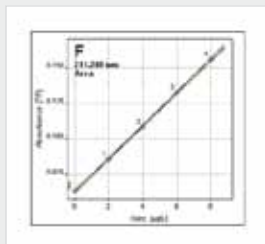
➤ **contrAA**<sup>®</sup> 700

# Fluorine Analysis With HR-CS MAS

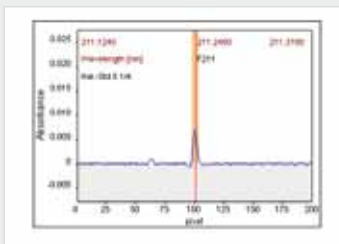
## Wavelength/measurement range

GaF 211.248 nm  
 Detection limit:  
 0.3 µg/L F  
 Measurement range:  
 1–500 µg/L F

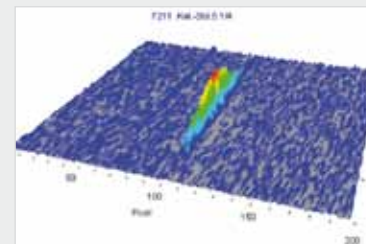
## Calibration curve



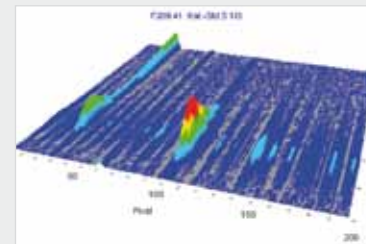
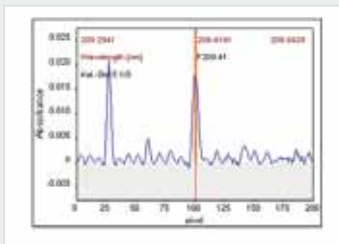
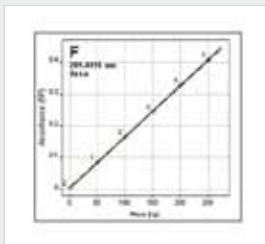
## Spectral vicinity



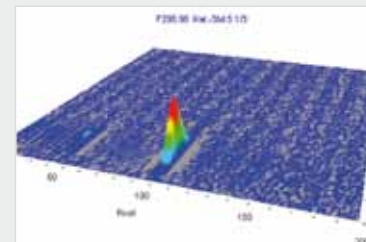
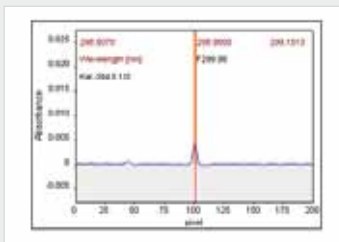
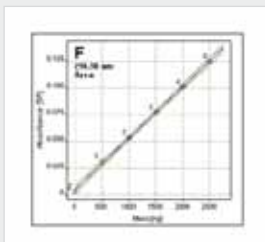
## 3D spectrum



GaF 209.419 nm  
 Measurement range:  
 5–20 mg/L F



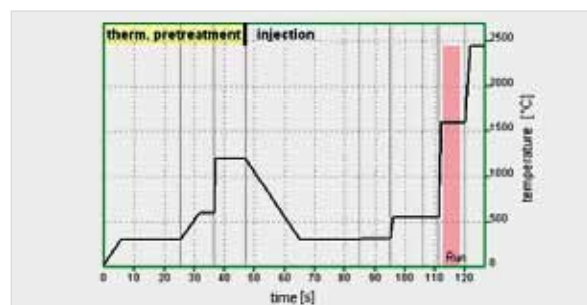
GaF 298.981 nm  
 Measurement range:  
 20–100 mg/L F



## Analytical Measuring Conditions

Use of a graphite tube permanently coated with Zr carbide with a PIN platform

### Temperature-Time Program With Thermal Modifier Pretreatment



Modifier	Volume	Thermal pretreatment
Ga(NO <sub>3</sub> ) <sub>3</sub> in H <sub>2</sub> O	10 µl	yes
Pd/Mg/Zr in H <sub>2</sub> O	10 µl	yes
Ga(NO <sub>3</sub> ) <sub>3</sub> in H <sub>2</sub> O	10 µl	no
NaAc in H <sub>2</sub> O	10 µl	no

## Fluorine Applications

- Determination of fluorine in water
- Determination of fluorine in toothpaste
- Determination of fluorine in blood
- Determination of fluorine in nitric acid
- Determination of fluorine in plants
- Determination of fluorine in medicines
- Determination of fluorine in mica
- Determination of fluorine in niobium pentoxide
- Determination of fluorine in copper concentrate ...



📞 **Would you like more information or receive application notes? Please do not hesitate to contact us:**

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