

# MGA-1000

Zeeman atomic absorption spectrometer



## Determination of trace elements

(Al, Ag, As, Ba, Be, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Se, Sr, Ti, V, Zn)

**and macroelements (Na, K, Ca, Mg) in water samples**

### INTRODUCTION

The method is designed to measure the concentration of elements in a variety of water samples, including natural water, tap water, drinking (incl. bottled) water, wastewater, mineral water, etc.

Embracing the challenge of measuring both trace and macroelements in one instrument, Lumex Instruments presents the graphite furnace atomic absorption spectrometer (GFAAS) MGA-1000.

This instrument and Lumex Instruments analysis techniques comply with international regulations for water analysis by GFAAS and are perfect for environment monitoring, food testing, wastewater management, and pharma applications.



### MEASUREMENT METHOD

#### Trace elements

Trace elements determination is based on stabilized temperature platform furnace (STPF) concept. Method for trace element determination complies with main standard methods like US EPA Methods 7010, 200.9 etc. Find the full lists of standards at [www.lumexinstruments.com](http://www.lumexinstruments.com).

Limits of quantification (LOQ) are listed in the table below.

Element	Al	Ag	As	Ba	Be	Cd	Co	Cr	Cu	Fe	Li	Mn	Mo	Ni	Pb	Sb	Se	Sr	Ti	V	Zn
LOQ, ppb (µg/L)	1	0.1	1	2	0.1	0.01	1	0.5	0.5	0.5	1	0.2	1	1	0.5	1	1	1	5	1	0.01

#### Macroelements

Macroelements direct measurement becomes possible due to technologies realized in GFAAS MGA-1000: gas-phase dynamic dilution system and precise graphite furnace temperature management.

**No flammable gas is needed, there is no time loss for GF to flame switching.**

Measurement ranges (with dilution) are listed in the table below.

Element	Na	K	Ca	Mg
Measurement range, ppm (mg/L)	2-5000	0.5-5000	2-5000	2-5000

## HIGHLIGHTS OF GFAAS ANALYSIS WITH MGA-1000

- ✓ Low detection limits and wide measurement ranges provided by state-of-the-art Zeeman high frequency polarization modulation (ZHFPM) background correction system
- ✓ True versatility in use – now there is no need in combined FAAS and GFAAS as MGA-1000 can analyze trace elements and macroelements all together
- ✓ Affordable instrumentation price
- ✓ Compact size and user-friendly design

## EQUIPMENT AND REAGENTS

Starter pack for MGA-1000 graphite furnace atomic absorption spectrometer already includes compact and powerful water-cooling system and ELTHERM software.

Graphite tubes will be included in delivery set as an option according to your application.

Argon is the only pressurized gas needed.

For proper accurate work in the laboratory there should be deionized (or bidistilled) water, standard reference materials for analyzed elements as well as some acids, glassware and matrix modifiers.

## MEASUREMENT PROCEDURES

Sample should be filtered and preserved before analysis.

An aliquot of the prepared sample is injected into the graphite furnace of the spectrometer and the measurement is made according to analytical procedure for a specific element.

Recommended sets of analytical parameters are provided for each element.

Sample injection volume is from 10 to 40  $\mu\text{L}$ .

Measurement data is collected and processed by the dedicated software ELTHERM included in the Starter pack.