

# RA-915 Lab

Zeeman mercury analyzer



## Direct total mercury determination in water

### INTRODUCTION

Mercury determination in drinking and waste waters is one of the most popular analyses used for environment pollution and sanitary control, as this trace element is considered highly toxic.

Many conventional methods of mercury determination in water use cold-vapor atomic absorption spectrometry (CVAAS) technique.

As an alternative, Lumex Instruments proposes the thermal decomposition method for direct analysis of all kinds of water and aqueous solutions using **RA-915 Lab mercury analyzer**. Unlike CVAAS, it does not require high-purity reagents, preliminary digestion of the sample, thorough laboratory preparation, and other costly and time-consuming procedures.



### MEASUREMENT METHOD

The sample is heated in the thermal decomposition chamber. The mercury compounds are evaporated and dissociated forming elemental mercury. All the gaseous products formed are transported into the heated analytical cell by Hg-free ambient air, and the mercury atoms are detected by differential atomic absorption spectroscopy. This method does not involve intermediate preconcentration of mercury on a gold trap, thereby eliminating ensuing problems. Zeeman background correction provides the highest selectivity without interference from the sample matrix.

Detection limit: **0,2 ppb (0,2 µg/L)**.

### ANALYSIS FEATURES

The proposed method of analysis by thermal decomposition shows the following advantages as compared to the conventional mercury determination by CV-AAS method:

- no laborious sample pretreatment with wet chemistry;
- no amalgamation step;
- high analysis throughput (less than 2 minutes per sample);
- no need for reagents and cylinders of oxygen, argon or other compressed gases;
- low running cost;
- no «memory effect»;
- high level of automation due to the use of autosampler;
- the CRM of any matrix can be used for calibration and QA/QC.

### EQUIPMENT AND REAGENTS

The following equipment and materials are used for analysis:

- RA-915 Lab mercury analyzer;
- PC with Windows® OS and RAPID software;
- any solid or liquid CRM of mercury;
- activated carbon, mercury-free.

## REGULATIONS

| Directives & standards for drinking water   | Limits, µg/L  |
|---|---------------|
| WHO Guidelines for drinking water quality (2022)  | 6             |
| Drinking Water Directive 98/83/EC   | 1             |
| US EPA National Secondary Drinking Water Regulations  | 2             |
| TR EAEU 044/2017 Technical Regulation on Packaged Water   | 0.2 / 0.5 / 1 |
| Japan Drinking Water Quality Standards (2015)   | 0.5           |
| GB 5749-2022 Standards for drinking water quality   | 1             |
| GB 2762-2022 National food safety standard – Maximum levels of contaminants in foods                      | 1             |
| IS 10500 : 2012 Drinking Water – Specification  | 1             |
| QCVN 01:2009/BYT National technical regulation on drinking water quality                                  | 1             |
| Ministério da Saúde do Brasil. Portaria de consolidação No 5, Anexo 7 do Anexo XX                         | 1             |
| Código Alimentario Argentino. Capítulo XII, Artículo 982<br>(Resolución Conjunta SCS y SAByDR N° 22/2021) | 1             |

