



## DIRECT AA **MERCURY** DETERMINATION IN FOODSTUFF AND MIXED FEED

### INTRODUCTION

Direct atomic absorption mercury determination (without any pre-treatment procedures) in food is complicated by its organic matrix. That is the reason why almost all AAS methods of mercury determination in foodstuff include sample digestion by acids. This stage extends analysis time, increases detection limit and becomes the main source of errors. Using a **RA-915M/RA-915+** mercury analyzer with Zeeman background correction and a **PYRO-915+** pyrolytic attachment allows direct mercury determination in foodstuff, food/feed products and similar samples at ppb level that saves time due to elimination of the sample preparation stage.

### MEASURING METHOD

The measuring method is based on thermal atomization of mercury from a sample using a **PYRO-915+ attachment** and its consequent determination by flameless AAS with Zeeman background correction using a **RA-915M/RA-915+ mercury analyzer**.

A sample is placed into the sample boat, which is inserted into the first chamber of the atomizer, where the sample is heated at a temperature of 200–800°C (depending on the selected operation mode). The mercury compounds are evaporated and partially dissociated, forming elemental mercury. All the gaseous products formed are transported into the second chamber of the atomizer by a carrier gas (ambient air). Mercury compounds are totally dissociated and the organic matrix of the sample is burnt out. Downstream from the atomizer the air flow enters the analytical cell heated up to 700°C, and the mercury atoms are detected by RA-915M/RA-915+ analyzer.

This approach does not involve preconcentration on a gold trap and “cooling step”, thereby eliminating ensuing problems. The use of ZAAS combined with a “dry” converter provides the highest sensitivity with no interferences from the sample matrix. Purified ambient air is used for combustion, so that no cylinders with oxidizer or compressed gases and “clean room” environment are required.

***Total time needed for determination of mercury is not longer than 2 minutes.***

### MEASUREMENT RANGE

The measurement range of the mass concentration of total mercury is **2.5–5000 µg/kg** (weight of homogenized sample is **30–400 mg**).

### ANALYSIS FEATURES

- Sample homogenization and weighting is enough as sample preparation
- Control of non-selective absorption during the measurement process allows optimizing of sample weight and reduces analysis errors
- Rapid analysis
- SRMs with any matrix (both liquid and solid) can be used for calibration
- Low running cost (Needs no chemical reagent)

### EQUIPMENT AND REAGENTS

The following equipment and materials are used for analysis:

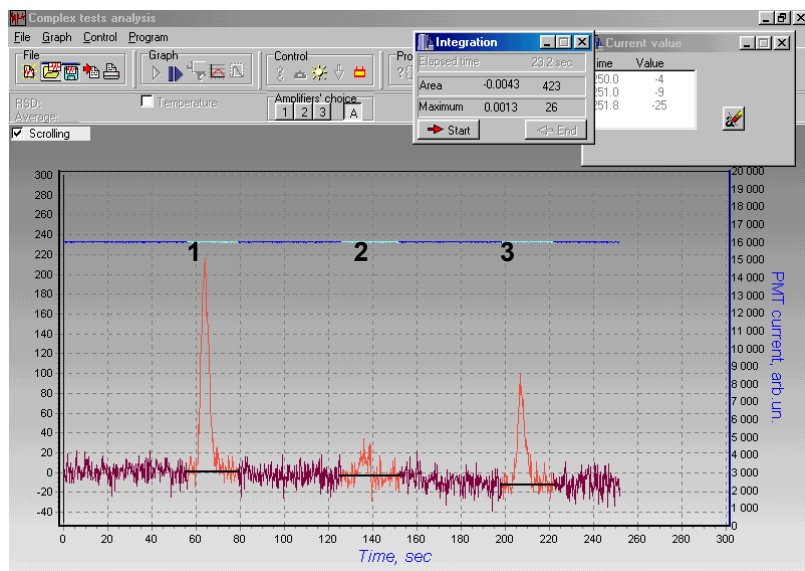
- Mercury analyzer RA-915M (RA-915+) with PYRO-915+ attachment;
- PC with Windows® 2000/XP/Vista/7 and dedicated software;
- CRM of mercury.



EXAMPLE OF REAL ANALYSIS

**Mercury determination in a cheese sample**

- 1 – Reference material SORT2 (HgO in quartz sand (31 ppb). Sample weight 70 mg.
- 2 – Cheese. Sample weight 25 mg (Measured value – 8.4 ppb).
- 3 – Cheese. Sample weight 100 mg (Measured value – 8.2 ppb).



The contents on this paper are subject to change without notice.