



DETERMINATION OF **MERCURY** IN MERCURY-CONTAINING WASTES

INTRODUCTION

Mercury is widely used in chemical industry, electronics, electric engineering, instrument making, medicine, pesticide and explosives production, etc. A number of techniques and equipment are developed for reclaiming mercury-containing waste, such as soil, sludge, stillage bottoms, slime sediments, fluorescent lamps, mercury-containing batteries. One of the most important problems arising in reclaiming, certification, storage and burial of waste is monitoring of residual mercury content. This problem can be solved by using a RA-915+/915M mercury analyzer with RP-91 and PYRO-915+ attachments.

MEASURING METHOD

The measuring method is based on the thermal atomization of mercury from a waste sample using a **PYRO-915+ attachment** and subsequent mercury determination by atomic absorption spectrometry employed in **RA-915M/RA-915+ mercury analyzer**.

For measuring high concentration of mercury "cold vapor" technique is used. This method is based on the reduction of mercury cations to the atomic state by a stannous chloride reducing solution in a reaction vessel of an **RP-91 attachment** and then measuring concentration of mercury atoms in the analytical cell of a mercury analyzer RA-915M/RA-915+.

It takes 30-50 min to prepare a sample for the "cold vapor" procedure, whereas the mercury content is measured by an RA-915+/915M mercury analyzer within 2 minutes.

MEASUREMENT RANGE

The measurement ranges of the mass concentration of mercury in waste samples are:

0.2–200 mg/kg for a sample weight of 0.2 g ("cold vapor" technique);

0.02–500 mg/kg for a sample weight of 0.01–0.1 g (thermal atomization technique).

ANALYSIS FEATURES

- Mercury determination without its preliminary accumulation on a gold sorbent.
- No cylinders with compressed oxygen or other gas are necessary.

EQUIPMENT AND REAGENTS

The following equipment and materials are used for analysis:

- Mercury analyzer RA-915M (RA-915+);
- PC with Windows® 2000/XP/Vista/7 and dedicated software;

Cold vapor method:

- RP-91 attachment;
- SRM of mercury ions solution.
- Distilled water;
- Nitric acid, high purity grade;
- Hydrochloric acid, high purity grade;
- Sulphuric acid, high purity grade;
- Potassium permanganate, analytical grade;
- Hydroxylamine hydrochloride, analytical grade;
- Stannous chloride □2-hydrate, analytical grade;
- Silicone oil;

Mercury thermal atomization method:

- PYRO-915+ attachment;
- SRM of mercury.

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