DETERMINATION OF A **TOTAL MERCURY** CONTENT IN URINE

INTRODUCTION

The main way of mercury removal from human body is its urinary excretion, which is an important diagnostic medium for screening examination of population, risk group determination, and diagnostics and treatment of mercury poisoning. Personnel of mercury-involving production facilities all over the world are regularly examined for mercury content in urine. The background mercury concentration in urine is at the 0.2–0.5 μg/l level. The ultimate tolerable mercury concentration in urine is 10 μg/l (for adults) and 5 μg/l (for children under 12 years).

MEASURING METHOD

Method of determination of total mercury concentration in urine is based on the reduction of mercury cations to the atomic state using a stannous chloride reducing solution in a reaction vessel of an **RP-91 attachment** (the "cold vapor" technique) and then measuring the atomic mercury concentration in an analytical cell of a **mercury analyzer RA-915M/RA-915+** with Zeeman background correction.
The mercury content in a urine sample is determined by the value of integrated analytical signal with due account of a preset calibration coefficient.

The mercury content is measured by an RA-915+/915M mercury analyzer within 2 minutes.

MEASUREMENT RANGE

Measurement ranges of mercury concentration in urine are as follows:

0.05–10 μg/l (with a multipath cell);

0.2–200 μg/l (with a single-path cell).

ANALYSIS FEATURES

- Direct analysis.
- High sensitivity.
- Low cost of analysis.

EQUIPMENT AND REAGENTS

The following equipment and materials are used for analysis:

- Mercury analyzer RA-915M (RA-915+) with RP-91 attachment;
- PC with Windows® 2000/XP/Vista/7 and dedicated software;
- SRM of mercury ions solution;
- Distilled water;
- Nitric acid, high purity grade;
- Sodium hydroxide, pure grade;
- Potassium dichromate, reagent grade;
- Stannous chloride dihydrate, analytical grade;
- Silicone oil.