



DETERMINATION OF TOTAL MERCURY CONTENT IN BLOOD BY CVAAS

INTRODUCTION

Blood is one of the most complex substances for determination of the Hg content. At the same time, blood is the most important diagnostic medium used for monitoring the effect of Hg vapor on the human organism. In almost all the countries, personnel of mercury-involving production facilities are regularly examined for the Hg content in blood, which should not exceed 20–50 µg/l, whereas in the case of a person unexposed to mercury vapor the blood normally contains 1–3 µg/l of Hg.

MEASUREMENT METHOD

Determination of the Hg content in blood involves microwave digestion of the sample and reducing Hg cations in the digested sample by a SnCl₂ solution in a bubbler of the **RP-92 attachment** ("cold vapor" method), followed by the AAS determination of atomic mercury in the multipath cell of a **RA915M mercury analyzer**.

MEASUREMENT RANGE

Detection limit	0.5 µg/l
Upper limit of the measurement range	100 µg/l (without dilution)
Blood sample volume	0.5 ml
Air flow rate	4 l/min

ANALYSIS FEATURES

- Analysis is done with preliminary sample digestion in a microwave digester, which greatly reduces the consumption of chemical reagents and the sample preparation time; a small signal from the blank sample substantially lowers the detection limit.
- Mercury determination is performed without its preliminary accumulation on a gold sorbent.
- Wide dynamic measurement range (2 orders of magnitude without diluting the sample).
- The detection limit is lower than the background Hg content in blood.
- Visualization of the mercury release from the sample via a user-friendly computer interface.
- Stable calibration coefficient.

EQUIPMENT AND REAGENTS

The following equipment and materials are used for analysis:

- Mercury analyzer RA-915M with PR-92 attachment;
- PC with Windows® XP/Vista/7/8 and RAPID software;
- SRM of mercury.

EXAMPLES OF ANALYSIS

Sample	Hg content, µg/l	Average, µg/l	RSD, %
Clean Check (Level-1), 2.9±1.0 µg/l	3.0, 2.6, 2.8, 3.6, 3.4, 2.4	3.0	15
BI-2 (blood of a person who was exposed to mercury vapor)	6.8, 7.0, 6.1, 7.4, 6.6, 7.2	6.9	6.7

The information in this leaflet is supplemental. To get more specific information on this method, please contact the developer of this method LUMEX INSTRUMENTS Group.

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