

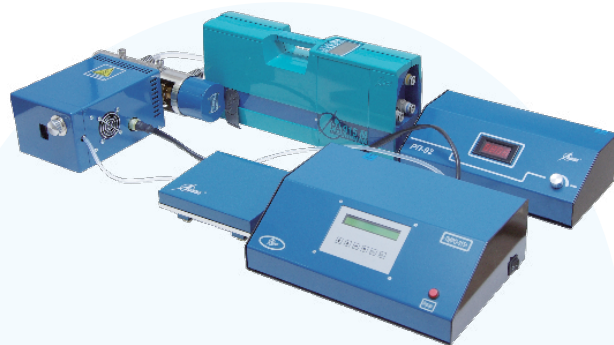


MERCURY DETERMINATION IN NATURAL GAS USING AMALGAMATION METHOD ACCORDING TO ASTM D5954-98(2014)E1 AND ISO 6978-2:2003

INTRODUCTION

The **ASTM D5954-98(2014)e1** and **ISO 6978-2:2003** standards specify a method for the determination of the mercury mass concentration down to $0.001 \mu\text{g}/\text{m}^3$ in pipeline quality natural gas. These standard methods are based on collection of mercury by amalgamation on a gold/platinum alloy with the follow-up desorption of atomic mercury and its determination by means of AAS or AFS.

Lumex Instruments has developed a practical guidance for the implementation of the **ASTM D5954-98(2014)e1** and **ISO 6978-2:2003** methods using **RA-915M mercury analyzer**.



MEASUREMENT METHOD

The method includes two consecutive stages:

- Gas sampling:
Known volume of natural gas passes through a sampler with the installed sampling tubes and flow meter; mercury is accumulated on the sorbent due to amalgamation.
- Analysis:
Sampling tube is heated up to $700\text{-}800 \text{ }^\circ\text{C}$, the collected mercury is released and its mass is measured using RA-915M mercury analyzer.



Reusable sampling tubes for mercury sampling from natural gas.

MEASUREMENT RANGE

The measurement range of the mercury mass concentration in natural gas is $0.001\text{-}100 \mu\text{g}/\text{m}^3$.

EQUIPMENT AND REAGENTS

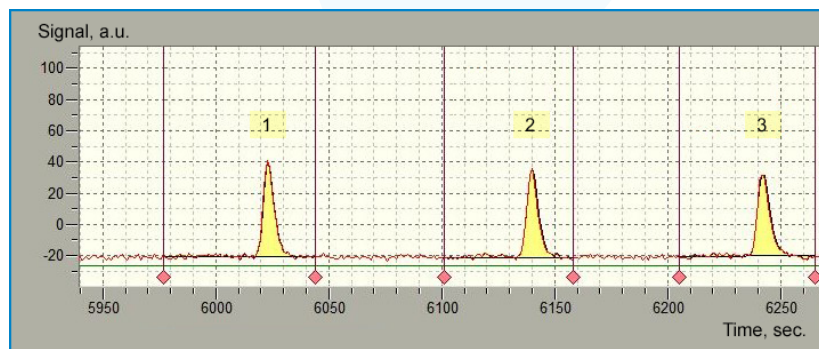
The following equipment and materials are used for analysis:

- Gas sampler for sampling tubes according to ASTM D5954-98(2014)e1 and ISO 6978-2:2003;
- Mercury analyzer RA-915M with PYRO-915+ and RP-92 attachments;
- PC with Windows® XP/7/8/10/11 and RAPID software.
- Kit for mercury determination in natural gas (includes sampling tubes, CRM of mercury ions, and activated carbon with mercury content ≤ 2 ppb).



Procedure of the sorption trap analysis.

EXAMPLES OF ANALYSES



Results of analyses of the sampling tubes spiked with 0.5 ng of mercury:
1 – 0.514 ng ,
2 – 0.515 ng ,
3 – 0.506 ng .
One measurement takes 2 minutes.

