



Hg analysis from air/gases with DMA 80 following HJ 910-2017 method



Summary

Precise and rapid determination of total mercury in air/gases via gold traps can be performed using the Autocollect for the sampling and Direct Mercury Analyzer for the final analysis process. Such an instrument requires no sample wet chemistry or pre-treatment.

Once a gold trap is introduced into the instrument, analysis is completed in ten minutes. Direct analysis of mercury, using the integrated sequence of Catalyst Conversion, Amalgamation, and Atomic Absorption Spectrophotometer.

Instrumentation

- Milestone DMA-80 unit tricell, controlled by terminal 660/1660 or PC software with DMA software, rev. 03 installed.



Milestone DMA 80



Application report

- b. Air/gas kit for Hg detection (PN DMA00700), compliant with HJ 910-2017 method, which includes:
 - Autocollect (PN AC001000A) : portable device for air/gases sampling via gold traps and connected via USB with the DMA software rev. 03.



- Gold trap (PN DMA9005. Compliant with HJ 910-2017 method): traps with gold content to measure the mass concentration of Mercury in air/gases, including elemental Mercury (Hg^0) and oxidized forms of Mercury (Hg^{+2}) in micro-grams per dry standard cubic meter ($\mu g/dscm$). Gases are collected onto the gold traps by Autocollect. The Quartz tubes with gold trap fits direct to the DMA autosampler to release the gold from mercury. The prepared cartridges are no ready to collect Hg on a blank free collector and should be stored in a closed container to avoid any Hg contamination from the air.

Typical lifetime is around 5000 samplings.



- Bags with well-known volume for Autocollect sampling available in different formats:
 - PN AC00013, 1 Litre
 - PN AC00014, 2 Litres
 - PN AC00015, 5 Litres



Procedure

Sampling

Please read the Autocollect user manual before to start with the sampling.

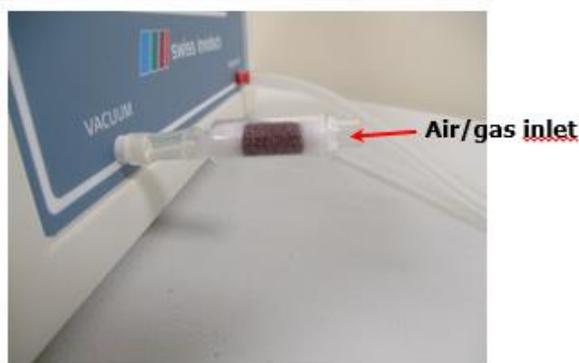
1. Before using gold traps, they need to be cleaned thoroughly. For the operating at very low Hg detection Milestone suggest to clean the gold traps in a muffle oven for 3 hours at $750^{\circ}C$.

We should expect a blank signal $< 0,004$ Abs (A) = $0,0259ng$ Hg, which is significantly below $0,15ng$ Hg as requested by HJ 910-2017 method

2. Connect the gold trap to the Vacuum plug of the Autocollect device. To the other plug, Pressure, of the Autocollect device, connect a bag with a well-known volume.



Application report



The smaller end of the golden trap must be connected to the Vacuum plug

- At the end of the sampling, put the gold trap into the sample tray of the DMA-80 unit.



Correct positioning of the gold trap on the sample tray

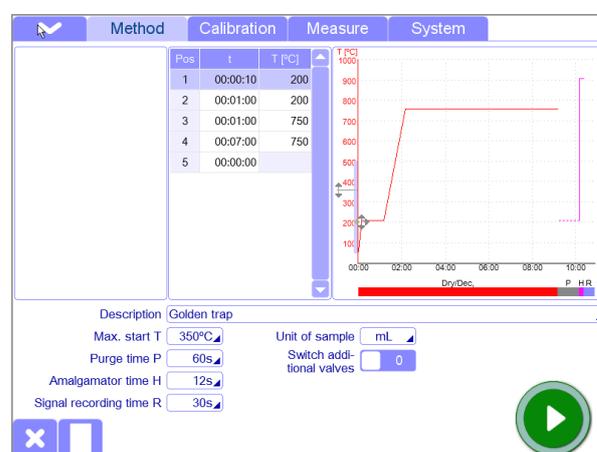
- Interface the Autocollect device with the DMA-80 software in order to export data from the device.
- Run the DMA-80 program to completion.
- Once the analysis is completed clean the gold trap in the DMA-80 unit processing. Fully automatic regeneration of the Au-quartz cartridges with the automatic DMA sample changer for blank free analysis. The DMA-autosampler recycles a large number of DMA-Au collection quartz cartridges before use to collect mercury in air/gases. In case you need to operate at very low hg detection Milestone suggest to clean thoroughly the

gold traps in a muffle oven for 3 hours at 750°C.

- Repeat the above sequences whenever you work with gold traps.

DMA 80 Program

The following analysis method must be used whenever you want to process the gold trap into the DMA-80 unit of mercury detection.



Conclusions

The DMA-80 Mercury Analyzer successfully processed gases sampled with Autocollect via gold trap. Total analysis time per sample was around 10 minutes, including the time employed to introduce the sample through the DMA80.

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