Whole Blood 3

Summary

Precise and rapid determination of total mercury in Whole Blood can be performed using Direct Mercury Analyzer. Such an instrument requires no sample wet chemistry or pre-treatment.

Once a weighed sample portion is introduced into the instrument, analysis is completed in six minutes. Direct analysis of mercury, using the integrated sequence of Thermal Decomposition, Catalyst Conversion, Amalgamation, and Atomic Absorption Spectrophotometer, is described in EPA 7473 and is validated for laboratory as well as field analysis.

Instrumentation

Direct Mercury Analyzer apparatus and supplies

Milestone DMA-80, 640-1640 terminal with DMA-80 software or DMA-80 PC software, metal boats.

Analytical balance, spatula, pipette, or appropriate mechanical pipette and volumetric flask (Class A), 50 or 100 ml.

Sample weight :

100 mg

Procedure

1. Place a boat on the balance plate, tare it and weigh the sample.
2. Introduce the boat into sample tray.
3. Run the DMA-80 program to completion.

DMA-80 program

N° step	Time	Temperature
1	00:01:00	200°C
2	00:02:00	650°C
3	00:01:00	650°C
Max start temp: 200°C		
Purge: 60 sec		

Sample 1 (Whole blood): Direct Analysis with DMA-80

Sample 2 (Whole blood): Direct analysis on diluted sample after digestion in closed vessel with QS-50(quartz insert) by Microwave system.

RESULTS

Sample ID	Hg
Sample 1	65.49 ± 0.9 µg/kg
Sample 2	1.16 ± 0.17 µg/kg

Sample 2:

Sample amount: 0.1782 g, 5 ml of HNO3(digestion with 5 ml of HNO3)

The digested sample has been diluted up to 10 ml with distilled water:

Dilution Factor = 56   AVG. 1.16 µg/kg

Whole Blood 3= 56 x 1.16 = 64.96 µg/kg

Recovery with QS-50 = 99.93%

Conclusion

The DMA-80 Mercury Analyzer successfully processed Whole Blood sample. Total analysis time per sample was less than 7 minutes, including the time employed to weigh each sample into the boat.