



## Summary

Precise and rapid determination of total mercury in Copper ore 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 :

*Copper ore:* Up to 0.6 mg (max)

*Copper ore diluted\*:* Up to 60 mg (max)

Due to big amount of Hg content in Copper ore has been preferred a dilution\* of sample by silica gel before analysis. After dilution the sample has been directly introduced into the metal boat.

## 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	00:02:00	650°C
2	00:03:00	650°C
Max start temperature: 300°C		
Purge: 60 sec		

## Results

Sample ID	Hg
Copper ore	1110 ± 0.05 mg/kg
Copper ore diluted*	5.94 ± 0.06 mg/kg

### \*Data of Copper ore diluted:

Dilution ( 0.05 gram of sample + 10,2680 grams of silica gel 70-230mesh).

Direct analysis after dilution by silica gel

Copper ore= Avg of Copper ore x DF

Avg of Copper ore after dilution=5.94

DF= 10,2680/0.0555=185,00

Copper ore= 5.94 X 185=1098 mg/Kg

Recovery : 98.9%

## Conclusion

The DMA-80 Mercury Analyzer successfully processed Copper ore diluted sample. Total analysis time per sample was less than 7 minutes, including the time taken to weigh each sample into the boat.