Application Note: HG/CH-01 **Field: Chemical**

AgNO3

Summary

Precise and rapid determination of total mercury in AgNO3 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 :

80- 100 mg

The sample has been mixed and then 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	00:01:00	200°C
2	00:02:00	650°C
3	00:01:00	650°C
Max start temp: 200°C Purge: 60 sec		

Results

N°	µg/kg
1	0.85
2	1.03
3	1.00
4	0.98
5	0.82

Avg: 0.94 µg/kg SD: 0.08 µg/kg RSD: 8.73 %

Conclusion

The DMA-80 Mercury Analyzer successfully processed AgNO3 sample. Total analysis time per sample was less than 6 minutes, including the time employed to weigh each sample into the boat.

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Application Note: HG/CH-02 **Field: Chemical**

NaOH and NaOCl

Summary

Precise and rapid determination of total mercury in NaOH and NaOCL 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, 660-1660 terminal with DMA-80 software or DMA-80 PC software, quartz boats.

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

Sample weight :

Up to 50-100 mg (max)

Additive:

Silica gel

Procedure

1. Place a boat on the balance plate, tare it and weigh 300 mg of additive.
2. Add the sample.
3. Introduce the boat into sample tray.
4. 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		

Results

Sample ID	Hg	Statistical data
NaOH	6.23 – 6.30 µg/kg	rsd: 0.59 %
NaOCL	1.70 – 1.80 µg/kg	rsd: 2.92 %

Conclusion

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

Application Note: HG/CH-03 **Field: Chemical**

FeCl3 50%

Summary

Precise and rapid determination of total mercury in FeCl3 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, 660-1660 terminal with DMA-80 software or DMA-80 PC software, quartz boats.

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

Sample weight :

Up to 50-100 mg (max)

Additive:

Aluminum oxide, activity grade: Super I

Procedure

1. Place a boat on the balance plate, tare it and weigh 500 mg of additive.
2. Add the sample.
3. Introduce the boat into sample tray.
4. 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		

Results

N°	µg/kg
1	91.54
2	97.58
3	91.44
4	95.75
5	91.54

Avg: 93.57 µg/kg SD: 2.59 µg/kg RSD: 2.77 %

Conclusion

The DMA-80 Mercury Analyzer successfully processed FeCl3 sample. Total analysis time per sample was less than 7 minutes, including the time employed to weigh each sample into the boat.

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Application Note: HG/CH-04 **Field: Chemical**

KBr 100 g/L

Summary

Precise and rapid determination of total mercury in KBr 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, 660-1660 terminal with DMA-80 software or DMA-80 PC software, quartz boats.

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

Sample weight :

Up to 50-100 mg (max)

Additive:

Aluminum oxide, activity grade: Super I

Procedure

1. Place a boat on the balance plate, tare it and weigh 500 mg of additive.
2. Add the sample.
3. Introduce the boat into sample tray.
4. 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		

Results

N°	µg/kg
1	0.40
2	0.45
3	0.40
4	0.42
5	0.44

Avg: 0.42 µg/kg SD: 0.02 µg/kg RSD: 4.97 %

Conclusion

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

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Application Note: HG/CH-05 **Field: Chemical**

KIO3 20 g/L

Summary

Precise and rapid determination of total mercury in KIO3 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, 660-1660 terminal with DMA-80 software or DMA-80 PC software, quartz boats.

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

Sample weight :

Up to 50-100 mg (max)

Additive:

Aluminum oxide, activity grade: Super I

Procedure

1. Place a boat on the balance plate, tare it and weigh 500 mg of additive.
2. Add the sample.
3. Introduce the boat into sample tray.
4. 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		

Results

N°	µg/kg
1	10.05
2	10.08
3	10.21
4	11.17
5	10.37

Avg: 10.38 µg/kg SD: 0.41 µg/kg RSD: 3.99 %

Conclusion

The DMA-80 Mercury Analyzer successfully processed KIO3 sample. Total analysis time per sample was less than 7 minutes, including the time employed to weigh each sample into the boat.

Application Note: HG/CH-06 **Field: Chemical**

CaSO4

Summary

Precise and rapid determination of total mercury in CaSO4 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, 660-1660 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 :

50- 100 mg

The sample has been mixed and then 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	00:01:00	200°C
2	00:02:00	650°C
3	00:01:00	650°C
Max start temp: 200°C Purge: 60 sec		

Results

N°	µg/kg
1	11.8
2	10.4
3	11
4	10.2
5	10.7

Avg: 11 µg/kg SD: 0.1 µg/kg RSD: 5.78 %

Conclusion

The DMA-80 Mercury Analyzer successfully processed CaSO4 sample. Total analysis time per sample was less than 6 minutes, including the time employed to weigh each sample into the boat.

Application Note: HG/CH-07 **Field: Chemical**

MgO

Summary

Precise and rapid determination of total mercury in MgO 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, 660-1660 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 :

50- 100 mg

The sample has been mixed and then 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	00:01:00	200°C
2	00:02:00	650°C
3	00:01:00	650°C
Max start temp: 200°C Purge: 60 sec		

Results

N°	µg/kg
1	42.2
2	45.6
3	43.1
4	45.7
5	44.3

Avg: 44.2 µg/kg SD: 1.5 µg/kg RSD: 3.47 %

Conclusion

The DMA-80 Mercury Analyzer successfully processed MgO sample. Total analysis time per sample was less than 6 minutes, including the time employed to weigh each sample into the boat.

Application Note: HG/CH-08 **Field: Chemical**

H_2SO_4 10%

Summary

Precise and rapid determination of total mercury in MgO 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, 660-1660 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 :

Until 200 mg (max)

Additive :

ZnO (Merk >99%)

Procedure

1. Place a boat on the balance plate, tare it and weigh 500 mg of additive.
2. Add the sample.
3. Introduce the boat into sample tray.
4. 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		

Results

N°	µg/kg
1	0.31
2	0.30
3	0.32

Avg: 0.31 µg/kg SD: 0.01 µg/kg RSD: 3.6 %

Conclusion

The DMA-80 Mercury Analyzer successfully processed H_2SO_4 sample. Total analysis time per sample was less than 7 minutes, including the time employed to weigh each sample into the boat.