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Total Mercury in Soil Sample using Direct Mercury Analysis

[Background]
Standard Reference Material (SRM) is used for the calibration of the measurement analysis, as a part of quality assurance programs. SRM verify the accuracy of specific measurements and support the development of new measurement methods. Industry, academia, and government use SRM to facilitate the trade and to advance research and development. SRM is also a kind of mechanism for supporting measurement traceability. So, measuring SRM precisely is absolutely necessary for human activity.

(References)
NIST HP:
http://www.nist.gov/srm/program_info.cfm

[Instrument]
NIC MA-3000 is a dedicated direct mercury analyzer which selectively measures Total Mercury by thermal decomposition, gold amalgamation and cold vapor atomic absorption spectroscopy, on virtually any sample matrix - solid, liquid, and gas. The MA-3000 offers quick results without any tedious, time-consuming and elaborate sample preparation process. It is a perfect solution to today's increasing laboratory demand for easy, fast and accurate mercury measurements.
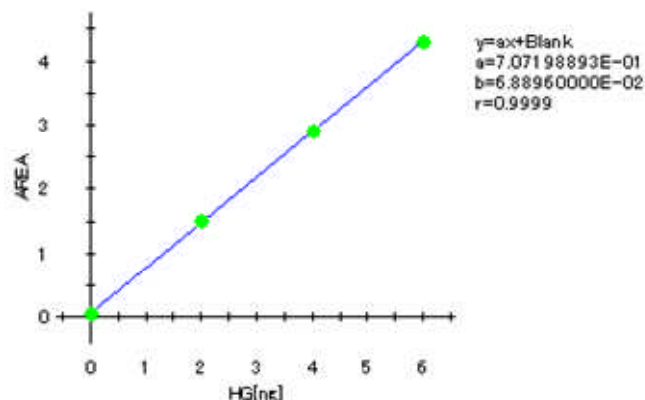
[Regulation]
Compliance with USEPA 7473.

[Calibration]
Calibration is done using certified aqueous ionic-mercury standard solution diluted to the required concentration. Least squared regression method is used to create and complete the calibration curve.

MA-3000 calibration data

y=ax+Blank
a=7.07198893E-01
b=6.88960000E-02
r=0.9999

[Method]
(Decomposition conditions)
Carrier gas: O_2

Sample	Conditions
STD solution	Atomize1: 150℃, 1min Atomize2: - , - Atomize3: 800℃, 2min
Soil Sample	Atomize1: 150℃, 1min Atomize2: 180℃, 2min Atomize3: 600℃, 2min

[Results]

Sample	N	Conc. (mg/kg)	CV (%)	Check STD after measuring (%)
Sample 1	5	0.0413	4.7	96
Sample 2	3	0.0729	2.1	96

Sample 1: Accuracy management sample supplied by Ministry of Environment at 2002
Reference value (Total Hg) 0.0334~0.0632 mg/kg

Sample 2: Estuarine sediment (NBS 1646)
Certificated values (Total Hg) 0.051~0.075 mg/kg

[Conclusion]
NIC MA-3000 is able to reproduce good STD recovery after repeated analysis of Soil Sample.

NIC MA-3000 analyzes Soil Sample samples with accuracy and precision.