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United States Department of the Interior

U.S. GEOLOGICAL SURVEY

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Denver, Colorado 80225

NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 1992.03

August 12, 1992

To: Assistant Chief Hydrologist, PC&TS
Regional Hydrologists
Chief, Office of Water Quality
Assistant Chief, Office of Water Quality
Deputy ACH for PC&TS for NAWQA
Area Assistant Regional Hydrologists
District Chiefs
Regional Water-Quality Specialists
Area Assistant Regional Hydrologists for NAWQA
District Water-Quality Specialists
Chiefs, NAWQA Study-Units
Chief, Ocala Project Office
Chief, Yucca Mtn. QA Group
Employees, National Water Quality Laboratory

From: Chief, National Water Quality Laboratory

Subject: Mercuric Chloride Preservation of S-34/S-32, O-18/O-16, and H-2/1-1-1 Samples

Author: Ann Mullin

Revision: No

At present, the National Water Quality Laboratory (NWQL) catalog states that mercuric chloride should be added to samples for the stable isotope analyses for sulfur, oxygen, and deuterium ratios.

Both the Chief of the Reston Isotope Lab and the Chief of the Denver Sulfur Isotope Lab have asked that this HgCl₂ requirement be deleted. They agree that the HgCl₂ is not necessary; that omitting the HgCl₂ would improve conditions for the analysts, and that this would prevent unnecessary pollution of the environment.

The NWQL conducted a comparison study to determine if the HgCl₂ affected the results of these analyses (attached). As can be seen from the comparison data, the results are unaffected by the HgCl₂.

Please discontinue the addition of HgCl₂ to samples for the stable isotope analyses for sulfur, oxygen, and deuterium.

This policy is effective as of the date of this memorandum.

/signed/

Peter F. Rogerson

Attachments

Key Words: Mercuric chloride, isotope, sulfur, oxygen, deuterium, radchem, preservation.

Distribution: See above plus QWTALK

DEUTERIUM EXPECTED 2 SIGMA PRECISION IS 2.0 ‰

With HgCl ₂		Without HgCl ₂
-44.0		-45.0
-50.0		-51.0
-49.5		-49.5
-33.0		-34.5
-51.0	*	-48.0
-48.5	*	-46.0
-49.5		-49.5
-41.0		-39.5
-50.5		-51.0
-51.5		-52.0
-134.5		-135.5
-130.5	*	-133.0
-134.5		-136.0
-136.0		-136.5

11 out of 14 comparison results check within the expected precision.

0-18/0-16 EXPECTED 2 SIGMA PRECISION IS 0.2 ‰

With HgCl ₂	Without HgCl ₂
-7.00	-6.95
-7.60	-7.65
-7.65	-7.60
-5.10	-5.15
-7.40	-7.50
-7.30	-7.30
-7.30	-7.30
-6.10	-6.10
-7.70	-7.65
-7.60	-7.55
-18.00	-18.00
-16.85	-16.90
-17.70	-17.70
-17.70	-17.65

All comparison results check within the expected precision.

S-34/S-32 EXPECTED 2 SIGMA PRECISION IS 0.5 o/oo

With HgCl ₂		Without HgCl ₂
5.3		5.2
4.8		5.1
4.7		5.1
21.6		21.7
-2.4		-2.0
0.6	*	-0.2
7.9		8.0
12.5		12.4
3.8		3.8
3.9		4.0

Nine out of ten comparison results check within the expected precision.