Flett Research - Recommended Sample Holding Times

Matrix	Preservation	Total Mercury	Methyl Mercury	Radioisotopes (Pb-210, Cs-137, Ra-226)
Fresh Water	Unpreserved	2 days or 28 days If BrCl will be added directly to original sample bottle[1].	48 hr @ 1-6°C in darkness[2]	n/a
	Acidified to 0.2–0.4% HCl	90 days[1, 3] Acid should be added within 2 days.	180 days in dark and cool [2]	n/a
	Oxidized • BrCl 5mL/L	90 days[1] BrCl should be added to the original bottle of unpreserved or acidified sample within 28 days.	n/a	
	Frozen (colder than -15°C) [4]	Not recommended[6]	180 days in dark [5]	n/a
Salt or Sea Water [Cl]>500PPM	Acidified to 0.2% • 2 mL/L 9 M H_2SO_4	180 days [2]	180 days in dark and cool[2]	n/a
Sediments/ Sand/Peat	Wet @ 1-6°C	28 days[7]	28 days[7]	Indefinite if hermetically sealed against water loss [11]
	Wet and Frozen (colder than -15°C) [4]	180 days[8]	180 days [8]	Indefinite if hermetically sealed against water loss [11]
	Dry @ ~20°C	Indefinite in dark[9]	Indefinite in dark[9]	Indefinite [11]
Fish and other animal tissue	Wet @ 1-6°C	5 days[10]	5 days[10]	n/a
	Wet and Frozen (colder than -15°C) [4]	180 days[10]	180 days[10]	n/a
	Dry @ ~20°C	Indefinite in dark[9]	Indefinite in dark[9]	n/a

[1] United States Environmental Protection Agency. 2002. "Method 1631, Revision E: Mercury in water by oxidation, purge and trap, and cold vapor atomic fluorescence spectrometry," EPA-821-R-02-019.

[2] United States Environmental Protection Agency. 2001. "Method 1630: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS," EPA-821-R-01-020.

[3] At Flett samples are acidified to (0.2-0.4% instead of 5mL/L which is 0.5%) in order to avoid transportation issues.

[4] Long term storage at -20°C or colder is recommended, with no average weekly temperature warmer than -15°C.

[5] Bloom, N.S "Determination of Picogram Levels of Methylmercury by Aqueous Phase Ethylation, Followed by Cryogenic Gas chromatography with Cold Vapour Atomic Fluorescence Detection." *Can. J. FishAq. Sci.* 1989, 46: 1131-1140.

[6] Freezing total mercury water samples is not recommended, Bloom suggested that there may be some loss of inorganic Hg during freezing. If accidently frozen: Before thawing, we quickly add BrCl to frozen samples and reseal so as to trap any volatile $Hg^{(0)}$ that may be present.

[7] EPA Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium - SW846 Chapter 3, Table 3A (2018).

[8] Horvat, M, Bloom, N.S, Liang, L. 1993. "Comparison of distillation with other current isolation methods for the determination of methyl mercury compounds in low level environmental samples. Part 1. Sediments." Analytica Chimica Acta. 281: 135-152.

[9] Estimate based on stability of freeze-dried reference materials

[10] Estimate

[11] Samples for radioisotope analyses do not require special preservation or storage conditions. Storage conditions are normally based on the clients requirements for future analyses other than radioisotopes. Preferably wet samples will be kept in cold storage (<6°C) to prevent deposition of reactive iron oxide on the interior walls of the container. The suggested shelf life for wet samples stored at room temperature is 90 days.

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