Methyl mercury

All samples are first spiked with $CH_3^{198}Hg$ (>96% enriched); sediment, soil and sludge samples are additionally spiked with $^{199}Hg^{2+}$ (>91% enriched) to facilitate correction for species interconversion if required. Water samples and extracts or digests are analyzed by aqueous phase ethylation, purging and trapping on Tenax, thermal desorption, separation by gas chromatography and detection by inductively coupled plasma – sector-field mass spectrometry (GC-ICPMS). Unless otherwise noted (a), the methods are accredited.

Matrix	**Fresh water**	**Marine water**	**Sediment, soil, sludge; [blood, serum] (a)**	**Biota (b)**
Shipping	Top filled glass, Teflon or HDPE bottle; store/ship cool and dark; if frozen pack samples individually in sealed zip-lock bags. Add 400 µL HCl per 100 mL if samples are held for more than 7 days (c)	Top filled glass, Teflon or HDPE bottle; store/ship cool and dark; if frozen pack samples individually in sealed zip-lock bags. Add 400 µL HCl per 100 mL if samples are held for more than 7 days (c)	Top filled bottle; store/ship cool and dark	Freeze before shipping and, if possible, ship in freeze box
Minimum amount (d)	100 mL	100 mL	1 g [2 mL]	2 g
Preparation	Spike; equilibrate overnight. (e)	Spike; equilibrate overnight.	Homogenize; spike; add $CuSO_4$ + KBr in H_2SO_4 + CH_2Cl_2 and extract. Recover CH_2Cl_2 phase, add high purity water and evaporate organic phase	Homogenize; spike; ultrasound-assisted digestion into 20% KOH in methanol (f)
Limit of reporting (g)	0.03 ng/L	0.1 ng/L	50 ng/kg; [30 ng/L]	200 ng/kg

Notes: (a) Information in square brackets is for clinical fluids. These methods have been validated but are not accredited. (b) Please mark the sample documentation “Samples for research purposes only. (c) Do not freeze top filled containers as these will break. Plastic containers holding frozen water samples often break, even when not completely filled, and should therefore be individually packed in zip-lock containers to minimize the risk for sample loss. The outside surfaces of the sample container should be cleaned before packing. (d) This is the minimum amount of sample required for a single analysis to reach the given limits of reporting. Larger samples are required for duplicate measurements and recovery checks. (e) Certain water types (e.g., sulfidic, highly organic, lyes) may need to be processed like solid samples; 30 mL sample is processed. (f) Ultrasound-assisted digestion with 20% KOH in methanol will not completely solubilize plants, insects, and some invertebrates, but normally provides quantitative recoveries of methyl mercury. (g) The limit of reporting is set at a level corresponding to the limit of quantification (LOQ; 10 x SD for blanks).

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