Sample Preservation Guidance - Instructions for Chemically Preserving Environmental Samples

Analytical Parameter	Chemical Preservative	Laboratory or Field Preservative	General Instructions [2]	pH	Additional Information
Metals: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr (Total), Cu, Fe, K, Li, Mg, Mn, Na, Ni, Pb, Sb, Se, V, Zn, Hg and Total Hardness [1]	Nitric Acid (HNO3), 1+1 - ampoules	Field preservation	1 ampule per 500-mL bottle	<2	Refer to "Nitric Acid Ampule Handling and Use", August 6, 2001, Susan Gale
EPA Method 1631 E - Trace Level Hg	None required	Sampling kits are prepared at the Central Laboratory. Samples are preserved with BrCl **by the laboratory** within 28 days of collection.	Refer to EPA Method 1669 for "Clean hands/Ditry hands" sample collection techniques.	N/A	Refer to "Sampling Kits for Low Level Mercury Analysis by EPA Method 1631"
Oil and Grease	6N Sulfuric Acid (H2SO4)	Field preservation	Add approx. 2 to 4 mL per 1 L bottle	<2	
COD	25% Sulfuric Acid (H2SO4)	Field preservation	Add approx. 2 mL per 500-mL bottle	<2	
TOC	Concentrated Phosphoric Acid (H3PO4)	Field preservation	Add approx. 1 mL per 500-mL bottle	<2	
NH3, NO3+NO2, TKN, TP	25% Sulfuric Acid (H2SO4) *0.008% Sodium Thiosulfate (Na2S2O3)	Field preservation	Add approx. 2 mL per 500-mL bottle	<2	*NH3 and TKN samples must be checked for residual chlorine and treated with 0.008% Na2S2O3 prior to acid preservation only when total residual chlorine is present.
Cyanide	6N Sodium Hydroxide (NaOH) *Ascorbic Acid	Field preservation	See "Preserving Cyanide Samples" instruction sheet.	>12	*Add ascorbic acid only if total residual chlorine is present. See "Preserving Cyanide Samples" instruction sheet.
Sulfide	2N Zinc Acetate [Zn(O3CCH3)2] soln' and 6N Sodium Hydroxide (NaOH)	Field preservation	See "Preserving Sulfide Samples" instruction sheet.	>9	
Coliform (Total, Fecal, E. coli and Enterococci)	0.008% Sodium Thiosulfate (Na2S2O3) soln' 15% EDTA	Bottles are sterilized at the Central Laboratory and shipped with 0.008% Sodium Thiosulfate (Na2S2O3) and 15% EDTA in them.	Do not rinse bottles prior to sampling. Use aseptic sampling techniques.	N/A	
Total Phenolics	1:1 Sulfuric Acid (H2SO4) Ferrous Ammonium Sulfate (FAS)	Field preservation	Add approx. 2 mL per 1 L bottle. Add 1 mL FAS.	<2	Samples containing oxidizers (e.g., chlorine) must be treated with 1 mL FAS.

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Acid-preserved VOA (3) **Groundwater Samples Only**	Sodium Bisulfate (NaHSO4)	Field preservation	Add 0.25 g per 40-mL vial or add 1 mL of a 25% solution per 40-mL vial.	<2	Do NOT use vials containing HCl. *Samples containing total residual chlorine must be treated with 0.6 g ascorbic acid prior to acid preservation.
Acid-preserved VOA (3) **Surface Water Samples Only**	1+1 Hydrochloric Acid (HCl)	Field preservation	Add 0.2 mL per 40-mL vial.	<2	Do NOT use vials containing Sodium Bisulfate - not approved for Clean Water Act. *Samples containing total residual chlorine must be treated with 0.6 g ascorbic acid prior to acid preservation.
SVOA	*0.008% Sodium Thiosulfate (Na2S2O3) soln'	Field preservation		N/A	*Samples containing total residual chlorine must be treated with0.008% Sodium Thiosulfate prior to acid preservation.
Pesticides/PCBs	*****0.008% Sodium Thiosulfate (Na2S2O3) soln' ****For pH adjustment only** - add 1:1 Sulfuric Acid (H2SO4) or 6N Sodium Hydroxide (NaOH)	Field preservation	** Add acid or base dropwise until pH is in the desired range (5-9 s.u.)	**	*****Samples containing total residual chlorine must be treated with 0.008% Sodium Thiosulfate prior to acid preservation. ******If samples cannot be extracted within 72 hours of collection, the sample pH must be in the range of pH 5 to 9.
Acid Herbicides	*****0.008% Sodium Thiosulfate (Na2S2O3) soln' ****For pH adjustment only** - add 1:1 Sulfuric Acid (H2SO4) or 6N Sodium Hydroxide (NaOH)	Field preservation	** Add acid or base dropwise until pH is in the desired range (5-9 s.u.)	**	*****Samples containing total residual chlorine must be treated with 0.008% Sodium Thiosulfate prior to acid preservation. ******If samples cannot be extracted within 72 hours of collection, the sample pH must be in the range of pH 5 to 9.

Footnotes

(1) Total Hardness by calculation - Total Hardness, mg CaCO3/L = 2.497[Ca, mg/L] + 4.118 [Mg, mg/L]

(2) Samplers must test the effectiveness of chemical preservation in the field. Pour an aliquot of the acid-preserved or base-preserved sample into a disposable container or onto a piece of narrow-range pH paper to determine if the pH is in the desired range. Do NOT put the pH paper directly into the sample container. If additional preservative is required, add dropwise until the sample reaches the desired range and document the amount of excess preservative used.

(3) If CIEVE is an analyte of interest, submit an additional unpreserved sample for analysis and label it clearly.

January, 2007