
ENVIRO MAIL # 003 MARCH 2012

# SAMPLE PRESERVATION AND HANDLING

## SAMPLE PRESERVATION

Sample preservation is the measure (s) taken to prevent reduction or loss of target analytes. Analyte loss can occur between sample collection and laboratory analysis because of physical, chemical, and biological processes that result in chemical precipitation, adsorption, oxidation, reduction, ion exchange, degassing, or degradation. Preservation stabilizes analyte concentrations for a limited period of time. The main factors affecting sample stability are: (1) the nature of the sample, (2) the sample container, and (3) the addition of preserving reagents to the sample.

Some samples must be preserved by filtration and (or) chilling and (or) chemical treatment. Chemicals used for sample preservation depend on the target analyte. The most frequently used chemical preservatives are ultrapure nitric acid (HNO3), hydrochloric acid (HCl), sulfuric acid (H2SO4), sodium hydroxide (NaOH), or phosphoric acid/copper sulfate (H3PO4/CuSO4).

Sample acidification is necessary for trace metal analysis. Nitric acid addition to pH < 2 is most frequently recommended (APHA 1980,USEPA 1979) for the analysis of total and dissolved trace metal preservation.

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## ALS SAMPLE PRESERVATION AND HANDLING

### SAMPLE CONTAINER

It is standard ALS practice to provide sample containers for all analyses to be conducted at any of our environmental laboratories. Soil samples are generally collected in a single glass jar for the majority of analytes. However, water samples are more complex and numerous bottles are often required for each sample depending on the analyses.

### SAMPLE VOLUME

Some sample containers are available in various sizes. Selection of the container volume is influenced by the number of analytes to be determined, the volume of sample required for each test and the sample representativeness. There may be occasions when more than one of the same type of container is required.

### PRESERVATION

Certain sample containers contain preservatives which are added to the container in laboratory prior to dispatch. Care must be taken that the preservative is not lost during sampling through spillage or rinsing of the container prior to sampling. All samples should be kept cold (4°C) to preserve samples integrity. To facilitate the refrigeration of samples, ALS also provides cooler boxes and ice packs.

### COLOR CODE LABELS

ALS sample containers have different colored labels. The color coding system was introduced to make containers easily identifiable for field and laboratory staff. The labels identify the major analytes and the preservatives for that sample container.



## HOLDING

ALS recommended holding times are indicated. Failure to comply with these Holding Times may impact data validity. Samples and COCs should be submitted with at least half the analytical holding time remaining unless prior arrangements are made otherwise. ALS Client Services are available to assist and provide guidance as required.

| Test Parameter(s) | Sample Bottle & Label Colour | Container Type (*Preservation*) |
|---|---|---|
| Acidity, Alkalinity, BOD, Chloride, Chromium VI, Colour, Conductivity, Flouride, Hardness, Nitrate, Nitrite, pH, Reactive Phosphorus, Silica, Solids, Sulphate, Turbidity, Paraquat/ Diquat |  | Sample Matrix: Water<br>Sample Container: Plastic bottle<br>Container Volume: 1L, 750ml, 250mL<br>Label Colour: Green<br>Preservation: *None* |
| Chlorophyll |  | Sample Matrix: Water<br>Sample Container: Plastic bottle (Opaque)<br>Container Volume: 1L<br>Label Colour: Green<br>Preservation: *None* |
| COD, Ammonia, Nitrate + NOx, Total Kjeldahl Nitrogen, Total Phenols |  | Sample Matrix: Water<br>Sample Container: Plastic bottle<br>Container Volume: 500ml,100ml<br>Label Colour: Purple<br>Preservation: *Sulphuric Acid* |
| Oil and Grease |  | Sample Matrix: Water<br>Sample Container: Amber Glass bottle<br>Container Volume: 1L, 500ml, 250ml<br>Label Colour: Purple<br>Preservation: *Sulphuric Acid* |
| Total Organic Carbon |  | Sample Matrix: Water<br>Sample Container: Glass vials<br>Container Volume: 40ml<br>Label Colour: Purple<br>Preservation: *Sulphuric Acid* |
| Pesticides, PCBs, SVOC, TPH (C10-C36), PAH, Speciated Phenols, Herbicides, Phthalate Esters, TBT, Explosives |  | Sample Matrix: Water<br>Sample Container: Amber Glass bottle<br>Container Volume: 500mL<br>Label Colour: Orange<br>Preservation: *None* |

| Test Parameter(s) | Sample Bottle & Label Colour | Container Type (*Preservation*) |
|---|---|---|
| Metals |  | Sample Matrix: Water<br>Sample Container: Plastic bottle<br>Container Volume: 100ml<br>Label Colour: Red<br>Preservation: *Nitric Acid* |
| VOC, BTEX, TPH(C6-C9) |  | Sample Matrix: Water<br>Sample Container: Glass vials<br>Container Volume: 2 x 40ml<br>Label Colour: Maroon<br>Preservation: *Hydrochloric Acid* |
| Cyanide (Total/ Free) |  | Sample Matrix: Water<br>Sample Container: Plastic bottle<br>Container Volume: 100ml<br>Label Colour: Blue<br>Preservation: *Sodium Hydroxide* |
| Sulphides |  | Sample Matrix: Water<br>Sample Container: Plastic bottle<br>Container Volume: 100ml<br>Label Colour: Fluoro Yellow<br>Preservation: *Zinc Acetate & Sodium Hydroxide* |
| Microbiological Analysis (including Total Plate Count, Total Coliforms, Faecal Coliforms, E. Coli -etc.) |  | Sample Matrix: Water<br>Sample Container: Sterile Plastic<br>Container Volume: 50ml<br>Label Colour: White<br>Preservation: *None* |
| All major analyses in soil |  | Sample Matrix: Soil<br>Sample Container: Glass Jar<br>Container Volume: 100ml, 40ml<br>Label Colour: Orange<br>Preservation: *None* |