
COLLECTION AND PROCESSING 6.6.3

Collect and process the samples in a manner that ensures that they represent environmental concentrations at the time of collection. Minimize the effects of wind, rain, cold, dust, and sun on the samples. Collect and process the samples in a chamber to protect them from airborne particulates.

Before collecting or processing the sample, clean the samplers, compositing and splitting devices, sample bottles, measurement vessels, and other equipment that contacts the sample (for detailed procedures refer to Horowitz and others, 1994).

- ▶ Prerinse the sample bottles with deionized water and store in sealable plastic bags until ready for field sampling (acid-rinsed sample bottles are recommended, especially for samples with low alkalinity or ANC). Field rinse the bottle(s) three times with sample (sample filtrate for alkalinity).
- ▶ Do not field rinse the measurement vessels. Volumetric pipets and graduated cylinders should be clean and dry before use.

To collect and process the sample:

1. Filter the samples along with other anion samples, if making alkalinity determination. The 0.45- μm flowthrough disposable filter capsule is the standard unit used by USGS. Record on field forms if a different unit or membrane is used, as this can affect the determination.
2. Fill and securely cap two 250-mL sample bottles with the sample (filtrate for alkalinity) to ensure there is enough sample to repeat the titration, to preserve the integrity of the second aliquot after the first has been opened, and to avoid losing the volume of sample needed to spillage.

3. Prevent agitation of the sample or prolonged exposure to air in order to avoid oxidation of hydrogen sulfide, ferrous iron, manganese, and prevent precipitation of mineral phases.
 - Loss of carbon dioxide (CO₂) from the sample will not change the alkalinity or ANC determination, but chemical or physical reactions can cause concentrations of bicarbonate and carbonate to change within minutes.
 - Begin the titration as soon as possible, as there is less chance of chemical precipitation once acidification begins. If the titration is delayed, maintain the samples at the temperature of their ambient environment.
 - If there is a tendency for mineral precipitation, collect and process the sample in an inert gas atmosphere.

Surface water

Collect and process a representative sample according to USGS-approved methods (see Horowitz and others, 1994).

- ▶ NASQAN, BENCHMARK, and NAWQA programs require filtration of alkalinity samples through a 0.45- μ m membrane.
- ▶ To collect and process samples from anoxic lake or reservoir depth intervals, adapt procedures described for ground water.

Ground water

Collect the sample as close to the source as possible; minimize aeration of the sample; take the precautions described in step 3 above.

- ▶ Purge the well (NFM 6.0) and connect the filter unit in-line with the pump.
- ▶ Flush and fill the lines and filter unit with sample water so as to exclude air.