Sample Preparation

It is the responsibility of the researcher to determine appropriate techniques, sample requirements, or additional preparations required for their study. Please contact the laboratory manager before submitting samples (ankerssm@iastate.edu).

Select the appropriate form below for submitting samples and use a unique identifier for each sample ID. If you are submitting duplicate samples, you can add a suffix to make it unique (i.e. sample1-01, sample1-02, sample1.1, sample 1.2).

- **All analyses sample submission form** - For submitting bulk samples (ie: for the GasBench, Picarro, etc) or for samples requiring processing prior to analysis.
- **EA/TCEA pre-weighed sample form** - For submitting prepared (weighed and tin wrapped) samples for Elemental Analyzer or Thermal Conversion Elemental Analyzer analysis.

Email a digital copy of your submission file to ankerssm@iastate.edu and ship samples to the following address:

Iowa State University
Stable Isotope Lab
253 Science I
Ames, Iowa 50011-3212

SOLID SAMPLES [GB, EA, TCEA]

Appropriate sample amounts must be determined by the lab manager before samples can be submitted to the lab. Samples being analyzed for $^{13}$C and $^{15}$N must be folded in tin capsules. Samples less than 7 mg can typically fit in 4x6 mm or smaller capsules, whereas 5x9 mm capsules are sufficient for samples up to 40 mg. For samples larger than 40 mg, use 9x10 mm capsules. Please use the smallest capsule possible and fold tightly into a smooth cube or sphere, avoiding protruding edges or flat configurations to reduce the risk of jamming or obstructing autosamplers and reactors. For more tips on packing samples refer to Sample Preparation Methods & Tips.

Packed capsules can be submitted in tightly sealed vials or in a 96 well sample tray. **Secure the lid with tape and label the tray before shipping.** For very small samples this is even more important. Wrapping the tray with parafilm or adding a sealing mat or index card before attaching the lid can ensure that samples don’t migrate out of their original positions during shipping. If samples arrive leaky or packaged poorly, additional fees may be applied to double wrap in fresh tin.

**Types of solid samples:**

**A. Carbonates**

**Costech Elemental Analyzer:** For $^{13}$C and $^{15}$N analysis, samples can be analyzed using the EA techniques identified above.

**ThermoFinnigan GasBench II:** For measurements of $^{13}$C and $^{18}$O, samples are analyzed using the GB. Samples (~5mg) are typically supplied in powdered form, which the lab staff weighs into 12 mL
Exetainer vials and acidifies. The lab accepts bulk samples (amount depends on C & O concentrations) or pre-weighed samples that are shipped in client’s own Exetainer vials.

B. Other Organic Materials (ie: animal tissues, soils, plant material, etc)

Costech Elemental Analyzer: Preparation techniques and ideal sample size vary depending on the elemental concentrations and type of material being analyzed. Samples must be dried and ground into a powder prior to weighing. For more information refer to Sample Preparation Methods & Tips or contact the SIPERG Lab manager.

C. Soils

Costech Elemental Analyzer: For $^{13}$C and $^{15}$N analysis, samples can be analyzed using the EA techniques identified above. For measurements of both $^{13}$C and $^{18}$O, please contact the lab manager to discuss sample preparation and analysis options.

WATER SAMPLES

Water samples must be clean and filtered (e.g., 45 µm glass fiber filters). Samples with little to no particulates such as snow or ice may not require filtration. If samples arrive and need filtration, this may incur an additional fee per sample. If you have questions about the conditions of your water samples, please contact the lab manager prior to shipping.

GasBench II: $^{18}$O and $^{13}$C$_{DIC}$ can be measured using the GasBench. Samples are prepared and analyzed in 12 mL Exetainer vials with septa caps. Please refer to Sample Preparation Methods & Tips or contact the Lab manager.

Picarro: $^{18}$O and $^2$H can be rapidly analyzed using our Picarro L1102-I Isotopic Liquid Water Analyzer. Samples are prepared in 2 mL Fisherbrand screw thread vials.