

Sample Preparation for Costech Elemental Analyzer

Theory:

The purpose of foil balling is to completely enclose sample in foil ball so that it can be run on the Costech for carbon and nitrogen elemental analysis. Any sample that spills out will be unaccounted for in the analysis.

Materials:

- microbalance or analytical balance
- acetanilide
- pre-milled (mortared at a minimum) samples
- labeled sample tray (see notes at end)
- two sets of forceps
- spatula
- gloves
- kim wipes

Method:

Work on a non-contaminating surface. Either tape aluminum foil that has been muffled to the work bench or cover surface with large kimwipe. Do not touch the tins with your hands.

1. Using forceps, open a tin cup so that the top is slightly wider than the bottom.
2. Place the tin cup on the balance, close the shields and tare.
3. Spoon sample into cup with a clean spatula. Be careful not to bump the balance table or spill sample. When the sample mass is within 0.5 mg of your target, close the shields and record sample mass.
4. Remove tin from the balance with forceps.
5. Using two pairs of forceps, squeeze the cup shut just above the top of the sample.
6. Use one pair of forceps to hold the cup while crimping/folding the top of the cup shut. There should be no air in the cup, only sample.
7. Squeeze any remaining air out and fold extra foil until the sample is squeezed on all sides and forms a ball or cube. Do not squish it to make it flat (pancake), it will jam the autosampler.
8. If there is a tear in the cup, start over.
9. Transfer cup to a labeled 24 or 96 well sample tray.
10. Carefully clean spatula and any sample spillage with kimwipes after each foil ball.

Sample size guidelines:

Calibration using acetanilide should be 5 points: 0.25 mg – 3.0 mg acetanilide.

Samples should be between 0.17 and 2.0mg C.

- Soil samples (~4% C) are typically rolled to 50 mg.
- Vegetation samples are typically rolled to 2-3 mg.
- Soils with large amount of carbonate should be rolled smaller (~30mg). Soils with carbonate can also be fumigated to remove inorganic carbon (see sample acidification text).

Samples should be between 0.02 and 0.3 mg N.

Sample labeling:

You will put your rolled samples in a 24 or 96 well plate. These are reusable; don't throw them away. Write your EAL ID on the side of the tray. Take a note card from Christine's office and cut it to fit adequately in the tray. Write all details on this card: your name, phone number, email, your PI's name, the date, and any other information that may be valuable later.

Put the notecard inside the tray. Put on the plastic lid and flip the tray over numerous times. Take off the lid and look at the notecard. Are there any "dirty" spots? Reroll these samples.



