

Sample Prep for Carbon and Nitrogen Analysis

Materials

Drying oven
Small aluminum weigh boats
2x2mm sieve with pan
Sample splitter
Small mortar and pestal
Whirlpaks
Flip cap vials
Desiccator
Microbalance
Sample tins
96 well plate

Soil samples

1. Soil samples should be dried in the 60° C oven for 48 hrs.
2. Once soils have been dried, pass entire soil sample through a 2x2 mm sieve. Discard particles that do not pass through sieve.
3. Using a soil splitter, split off a subsample for analysis. Soil may need to be split several times in order to obtain the desired “split amount” of ~3g.
4. The remaining soils should be archived in a whirlpak.
5. Grind the 3 g of soil in the mortar and pestle. Make sure that there are no recognizable plant parts, small rocks or sand grains. It is important to have a homogeneous sample since you are analyzing such a small sample size. Place ground soil into flip-cap microfuge vial. Between samples wipe mortar and pestle with Kimwipes and if needed with a small amount of water.
6. Samples should be stored in a desiccator prior to packing and weighing.
7. Take sample to the Sartorius microbalance.
8. Make sure that the balance is leveled and properly calibrated (see *Microbalance Protocol*).
9. Press the blue button to take microbalance out of standby.
10. Place a tin on the microbalance, close the draft shield, and tare.
11. Place the tin into the holder and flare the top to make it easier to load sample.
12. Load sample using the small spatula.
13. Pick up the tin with the forceps and give the forceps a tap to compact the sample within the tin.
14. Crimp the tin starting from the bottom and moving toward the top of the tin. Fold over top edges and roll the top down. The shape should be a ball or a small cube.
15. Return packed sample to scale and weigh. Make sure that you are not touching the table, as this will make the scale fluctuate. Once the sample weight has stabilized, record the value on the data sheet.
16. Make sure there is no soil leaking out of the sample or there are no tears in the tin.
17. Place sample in correct cell in 96 well plate and make sure the number matches the data sheet.
18. Between samples wipe off tools with Kimwipes.

Plant samples

1. Plant samples should be dried in the oven at 60°C for 48 hours.
2. Once samples are dried, grind them with the grinding mill into a fine powder. It is important to have a homogeneous sample since we are analyzing such a small sample size.
3. Samples should be stored in a desiccator prior to packing and weighing.
4. Follow steps 7-18 for Soil sample protocol.

Determining the Correct Sample Weight:

1. Estimate %C for your samples based on previous runs or literature values. This will determine how much sample you will weigh into the tins. Here is a general rule of thumb:

%C	Weight (mg)
0.6-2.4	25-40
2.5-5	15
40-70	2-3

If you have no idea what the %C is for your sample then you can determine weights based on whether it is plant or soil material:

%C	Weight (mg)
Plant	2-3
Rock	60
Mineral soil	50
Most Colorado Soil	10-15
Desert soil	30-40

Note: These values DO NOT have to be exact. Don't spend extra time trying to get an exact number. It only matters that the correct weight is recorded. Consult with the Barger Lab before deciding on a sample weight.