

Microbalance Protocol
Hofmockel & Harpole Labs
Elizabeth Bach, April 2011

- 1) The microbalance is an expensive and sensitive machine. It is **everyone's** responsibility to keep it in top working condition, which includes cleanliness. Treat the microbalance with respect, your actions **WILL** affect others' samples and data quality. The operator manuals are located in the right-hand drawer beneath the microbalance for further reference.
- 2) Microbalance is located in the Harpole lab, room 032 (basement). Hofmockel lab has a key to this room; it is on the key ring with the other basement keys. This key ring is kept in the upper right drawer located immediately to the right of the Hofmockel lab door. Return keys to this drawer when finished.
- 3) Micro-scoops and forceps are located in the left-hand drawer beneath the microbalance. Harpole weigh tins and the calibration weights are also located in this drawer.
- 4) There are additional microbalance tools in the drawer within the microbalance console (on the left side). This includes a larger pair of anti-magnetic forceps and a brush that can be used for cleaning the inside of the scale. Brush out the inside of the scale anytime there is a spill, which should be rarely. Do not brush the actual weighing platform, even the slightest pressure on the scale can harm the microbalance. If there is a spill on the weighing platform, find a graduate student or post-doc immediately. She/he will use either the brush or compressed air to clean the platform for you.
- 5) Sign-in on the microbalance use sheet, include the date.
- 6) It is imperative that the microbalance and the work area around it is kept **clean!** Wipe down counter top and any tools you intend to use with ethanol and Kim-wipe **before** weighing any samples. There should be a squirt bottle of ethanol located in the microbalance work area. For large quantities of samples, Hofmockel lab should bring a bottle of ethanol downstairs so that we do not use Harpole lab supplies. Acetone may also be used to clean tools and workspace, but always follow acetone cleaning with ethanol to eliminate any residue.
- 7) The microbalance has a built-in calibration feature and should auto-calibrate each time it is turned on. Periodically it is wise to test the balance calibration by weighing the calibration weights. We have a 20 mg and 200 mg weight. These weights should **ALWAYS** remain in their respective containers and only be brought out to test the balance calibration. If you think the microbalance is in need of calibration, let a graduate student or post-doc know immediately.
- 8) Always **wear gloves** when working with the microbalance. Oils from hands will affect the weight of objects and will harm the microbalance.

- 9) **Never dispense the material you are weigh inside the scale!** Always place the weigh tin on the scale, tare the scale, remove the tin from the balance, place the material in the tin, and place the tin back onto the balance. This way, any spills will happen outside the balance.
- 10) Only use **anti-magnetic forceps** inside to place or remove tins from the scale. Regular forceps will affect the functioning of the scale. Do not use anti-magnetic forceps for dispensing samples or materials.
- 11) When placing tins on the scale, allow the tin to “drop” from a short distance above the scale. Placing the tin on the scale can result in downward pressure on the balance, which will harm the microbalance.
- 12) The microbalance is highly sensitive and is affected by slight movements of the lab bench. **Do not touch the lab bench** while waiting for the balance to equilibrate.
- 13) Humidity and static also affect microbalance function. If samples are not equilibrating, it may just be the conditions in the lab on a certain day. Ask a graduate student or post-doc if you are having problems. You may have to quite weighing for a while and return to the task later.
- 14) Microbalance weights can be recorded directly into an Excel file.

Soil C & N weighing procedure:

- 1) Hofmockel tins for soil or reagent measuring are located in the Hofmockel lab in the drawer labeled “weighing supplies.”
- 2) Using a pair of blunt forceps, select a tin from the box. Place the tin on the clean bench and crimp a small “handle” and open up the top of the tin. This will make it easier to grasp and move the tin with the forceps and place the soil inside the tin.
- 3) Tare the microbalance.
- 4) Place the empty tin on the scale, and wait for the circle to appear in the upper left corner of the balance screen. Press the tare button.
- 5) Remove the tin from the scale.
- 6) Scoop soil into the tin (~2 scoops of soil) and place the tin on the scale. It is best to “drop” the tin onto the scale rather than place it, as downward pressure on the scale can affect microbalance accuracy and function.
- 7) When the circle disappears on the screen, record the weight (for soil, ~50 mg). The weight may drift up after a few moments on the balance, this is indicative of the sample absorbing water from the surroundings. As long as you record the **initial** stable weight, this is not a problem.
- 8) Remove the tin from the scale. Using the blunt forceps, crimp together and fold over the top of the tin. Gently squeeze the tin to form a cube. If the tin is too flat, it can get caught in the C & N analyzer machine.
- 9) Test the tin for any leaks by gently dropping the tin on a white sheet of paper. If you see any soil, you must throw the tin away and re-do the sample.
- 10) When the tin passes the leak test, place it into a 96-well plate with lid. Be sure to record which sample corresponds to each well on the plate. Label the plate clearly, including the date and your initials.
- 11) Clean the bench and tools with ethanol after each sample.
- 12) Additional tips for working with stable isotope samples:
<http://stableisotopefacility.ucdavis.edu/13cand15ntips.html>