

## FREEZE DRYER INSTRUCTIONS

### Pre

1. make sure the container is only about 1/5 full to avoid boil over e.g., 15 mL for a 50 mL tube
2. remove the cap and keep, label as needed
3. cover the container with parafilm and poke holes to allow ventilation
4. put the container(s), in a beaker if needed, into -80 °C for a few hours, dry ice bath or liquid nitrogen will work too

Note: There is only a single 600 mL flask (in drawer) to use with the manifold.

### Start

1. flip the POWER switch on the back of the machine to ON
2. install the baffle plate in the chamber and place the lucite manifold adapter plate on top of the chamber
3. press the yellow Condenser button, the temperature will start at about +20 °C; it should say "on" after the Condenser Temp reading in the first line of text of the LCD display
4. the condenser temperature will reach -80 °C in about 3 min, wait a few more min until the coil is frosted over, about 10 min
5. if you will use the chamber, you can load the frozen sample on the baffle plate; otherwise skip
6. if you will use the tray, you can place the tray on the manifold adapter plate and then load the frozen sample, otherwise skip
7. place the manifold on the manifold adapter plate, make sure all the valves are closed with the long white wings pointing up
8. press the red Vacuum button, make sure it says "On" after the vacuum reading in the second line of text
9. after about 15 minutes make sure the Vacuum reaches 200 mtorr. If pressure is not coming down there is a leak somewhere e.g., a valve has left open or outgassing from your sample
10. if you will use the manifold, you can load the frozen sample in the flask; otherwise skip

Note: To control the Vacuum at a specific setpoint, press Vac Control button to enable, and press the Up or Down buttons to adjust the vacuum level. The screen should read VacSet ON. Press Vac Control again to disable. Vac Control can be set at any time, e.g., before evacuation.

### Finish

1. press the red Vacuum button, it should say "off" next to the vacuum.
2. press the yellow Condenser button, it should say "off" next to the temperature.
3. open one or two valves slowly to release the vacuum.
4. remove manifold, take out samples, etc...
5. flip the POWER switch to OFF
6. there will be a build up of frost on the condenser coils, when it thaw, water will drain through a hole in the bottom of the chamber; plug the plastic hose to the quick release connector below the LCD display and control panel to drain into a bucket.
7. log your time using the online form

Other notes:

[timing]

room temp --> -80 °C in 3 min

atm --> 200 mtorr in 6 min

[lucite manifold adapter plate setup]

front (with marking and against 1 set of double round seats) 4.5 cm

left 2 cm

right 1.5 cm

back 7.2 cm

other locations might work too

[baffle plate setup for position #2, p.12 of the manual]

removed handle

slide a short length of plastic tubing on the central tube

notched one end to make sure there is not a seal between the central tube and the hole in the chamber; might not be important