

Instructions for the Critical Point Dryer

1. Turn the power on and the valve heater on ten minutes before using the CPD
2. Have samples sitting in 100% alcohol in basket
3. Tighten the top of the specimen cylinder fully.
4. Make sure all the valves on the CPD are closed
5. Open the main valve of the CO₂ tank at least ½ way
6. Slowly open the fill valve, watching the pressure gauge. You only need to open it a little bit.
7. Slowly open the vent valve. You only need to open it a little bit as well.
KEY: find the ratio of fill to vent so that the temperature begins to drop.
8. Let the temperature drop to 10 degrees.
9. Close the fill valve.
10. Fully open the vent valve, dropping the pressure to zero. The temperature will rise, do not worry about this.
11. Load your specimen into the cylinder (putting the holding cylinder on top of the white plastic piece).
12. Close the vent valve.
13. Slowly open the fill valve. You should begin to see liquid CO₂ filling up the chamber. Let it fill ½ way up the top window. If the column will not fill, slightly open the vent valve as well.
Next steps: Soak the sample to eliminate all residual ethanol from the sample
14. Let the sample sit in the liquid CO₂ for a few minutes.
15. Decrease the CO₂ level using either the drain valve or the vent valve.
Drain Valve: may be gentler on delicate samples.
KEY: Do not let the level of CO₂ drop below the sample.
16. Re-fill the chamber with liquid CO₂. You may have to open the vent valve as well as the fill valve to get liquid CO₂ to refill the chamber.
17. Repeat these steps until you no longer smell ethanol when you decrease the CO₂ level.
18. When no ethanol is remaining, refill the chamber with liquid CO₂.
19. Make sure the fill and vent valves are closed.
20. Turn on the chamber heater and let the temperature reach 42 degrees.
21. Watch the pressure gauge as the temperature rises in the chamber.
KEY: Do not let the pressure exceed 1300 psi. It will get close to 1300 as the temperature approaches 40 degrees. If necessary, open the vent valve briefly to decrease the pressure. You may have to open the valve multiple times while you wait for the temperature to reach 42 degrees.
22. Once the temperature reaches 42, begin to vent the chamber.
KEY: Vent slowly!!!! You may have to manipulate the vent rate many times initially to reach a slow level of venting. You are aiming for 100 psi/minute.
23. Keep the chamber heater on while you vent the chamber.
24. Once the pressure is zero, open the cylinder and remove your sample. Handle your sample carefully.
25. Proceed with sputter coating OR place your sample in the desiccators.
26. Close the valve on the CO₂ tank.
27. Bleed off the remaining CO₂ in the line by opening the fill valve with the top of the chamber loose.