



Denton Vacuum Evaporator

Carbon Coating

1. Load carbon rods.
 - a. First carbon rod will have a flat end.
 - i. Before loading, gently swipe flat end against carbon paper to create a smooth flat surface.
 - ii. Load this on so that $\frac{1}{4}$ inch is exposed from end of rod holder. You may use a wooden stick or another carbon rod to push it into position.
 - b. Tighten thumbscrew. NOTE: Do NOT over tighten! Or carbon rod will break.
2. Load pointed-end carbon rod.
 - a. Break off tip of old pointed rod.
 - b. Re-sharpen the rod using the specified sharpener. You may need to apply some pressure to the rod for it to sharpen.
 - c. Deflect spring-loaded holder about $\frac{3}{8}$ inch and press pointed-end rod so that it is touching flat end rod.
 - d. Tighten thumbscrew. NOTE: Do NOT over tighten! Or carbon rod will break.
3. Cut a piece of photographic paper large enough so that once your sample is placed on top of it there is at least an inch sticking out.
4. Place of piece of photographic paper on the stage.
5. Place your sample on top- making sure to leave some of the paper sticking out.
6. Place a drop of immersion oil on the photographic paper to act as an indicator.
7. Lower bell jar, being careful not to hit any bolts on baseplate.
8. Turn MODE SELECT switch to MANUAL.
9. Press ROUGH switch.
10. Set the thermocouple gauge to FORELINE.
11. Wait until the FORELINE pressure reaches 100, then...
12. Turn the thermocouple dial to the chamber setting. When there is a vacuum of 100 then proceed to the next step.
13. Once an appropriate vacuum is achieved, **CLOSE ROUGH!**
14. OPEN BACK. Allow backing pressure to reach...? Then continue on to next step.
15. OPEN HI-VAC. Vacuum must reach at least 10^{-5} before continuing on with procedure.
16. When chamber setting on thermocouple gauge goes zero, turn on HIGH VACUUM gauge (far right side of panel).

17. Add liquid nitrogen to funnel (about 2 funnels full) on side of evaporator. Vacuum should reach 2×10^{-5} or less for carbon evaporation.
18. Turn off HIGH VACUUM **gauge**.
19. Make sure that FILAMENT POSITION (left-right switch) is set to the **right**.
20. Place FIL/GLOW selector switch in **FIL** position.
21. Make sure that FIL adjust knob is at **zero**.
22. Turn on FIL/GLOW power switch.
23. Slowly turn Fil adjust knob to about 10 Amps to degas carbon rod which heats and turns red. Hold for 5 seconds.
24. Increase amperage to evaporate. Allow carbon rod to spark and then back off amperage *slightly*.
 - a. NOTE: **Do NOT look directly at carbon rod when you are evaporating!**
 - b. Use welding goggles, or look at your indicator drop.
25. After evaporating, turn off FIL/GLOW power switch
26. Rotate MODE SELECT switch to AUTO VENT. Allow carbon rods to cool before removing.
27. Raise bell jar by holding one hand at base while gently breaking the vacuum seal using the other hand on the opposite side of the bell jar.
28. Clean inside of bell jar when finished with spray cleaner and soft cloth.
29. Go back to step #1 to carbon coat additional samples or go to SHUT DOWN to turn off evaporator for the day.