

Introduction of sample into XPS

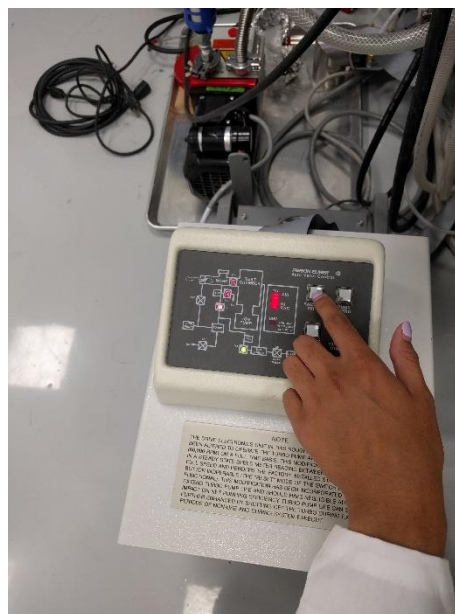
To introduce a sample into the XPS machine, it is required that the researcher maintain a clean environment and be attentive as to avoid any errors when inputting the sample. A series of steps are given to inform how to successfully introduce a sample into the XPS machinery.

1. The researcher must begin by putting on his or her lab coat, a pair of disposable latex or vinyl gloves, and a scrub mask (if working with powder solutions).



2. Next is to prepare the sample for introduction. With a cloth soaked in methanol, cleanse the surface of the sample disk.
 - a. If working with a uniform sample, place the sample onto the sample disk in an area that is most effective for analyzing. Secure the sample with the "arm" by adjusting the screw. *Tip: Do not fasten the screw excessively.
 - b. If working with a powder sample, use Kapton, silver or carbon UHV tape. Place an appropriate amount (about 10 to 15 milligrams) of sample onto the sample disk. Arrange the powder solution into a defined area, so that the tape fully covers it. When applying the tape, do not be alarmed by the electrostatic from the tape that causes the sample to disperse. Simply make sure to quickly spread the tape fully over the sample. Gently rub the tape to ensure its adhesiveness.

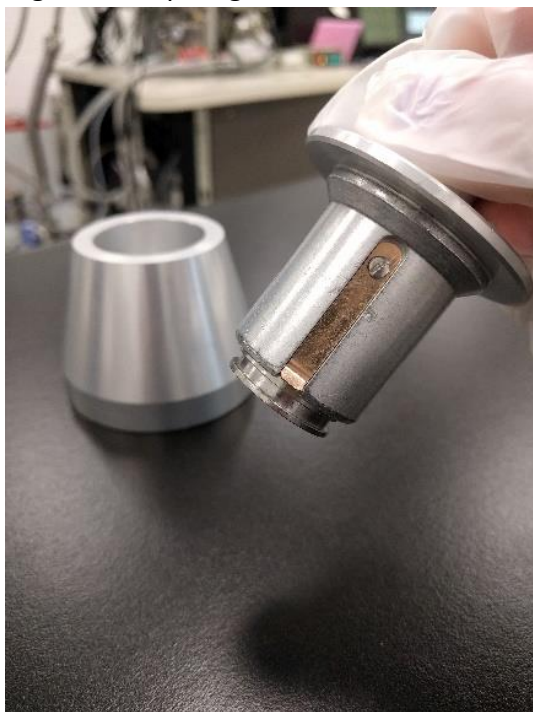
3. Refer to the Auto Valve Control (AVC) box and locate the **Backfill Intro** button: press it.



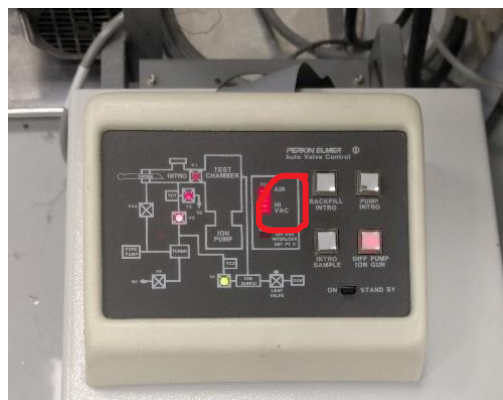
4. Refer to the AVC box and press the **Pump Intro** button. Locate the nitrogen tank and release the gas into the pre-chamber to loosen the chamber cap.



5. Wait approximately 5 to 7 minutes for the pre-chamber cap to loosen and then remove it. Utilizing the Faraday cup or your hand, pick up the sample disk and adjust it onto the prongs in the pre-chamber. Be sure that the prongs sustain the sample disk by gently pushing your finger onto the disk against the prongs.



6. Cease the flow of nitrogen into the pre-chamber by closing both valves (behind the XPS machine and on the nitrogen tank itself).
 - a. Place the cap on top of the pre-chamber.
 - b. Wait approximately 15 to 20 minutes before introducing the sample into the main ultra-high vacuum chamber.
7. Refer to the AVC box and locate the **Intro Sample** button: press it.



8. Carefully push the sample into the vacuum chamber until it reaches the area under the x-ray source.
 - a. Adjust the "X", "Y", and "Z" knobs to appropriately fit the sample disk.
 - b. Once the sample disk is mounted on the sample holder, carefully release the sample disk from the prongs and pull the prongs back into the pre-chamber. If the sample disk is lopsided, repeat step 8.a. until the prongs can be removed successfully.

