

Sputtering HowTo

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SEXAFS, SAMBA beamline, SOLEIL

The sputtering gun is connected to the main chamber via a CF flange close to the large viewports on the side of the vacuum vessel opposite to the entrance door. You can easily recognize it for the small VG leak valve.

There is another leak valve below on the chamber, a larger sapphir Caburn MDC valve, that is used to admit other gases in the chamber and it was used when sputtering with the previous gun. Do not use it for sputtering.

The gun is a PREVAC 0.15-5kV ion source, the control unit (also from PREVAC) is just in front of the gun.

1. Set the sample in the right position as suggested in the document with the sample holder positions (usually, a copy is hanging on the side of one control rack in the SEXAFS hut); Connect the sample to ground through a multimeter set on the μ A range.
2. Connect the cable (a black and quite rigid one) to the gun connector.
3. Switch off the high voltage, low voltage and grid on the dinodes. Power supplies are in the rack outside on the left side of the SEXAFS door, simply put the small lever switch in the standby position, do not touch the voltage control knob.
4. **Retract the fluorescence detector and then close its gate valve.**
5. Set the gauge to 0.1mA emission (if applicable).
6. Close the valve on the ion pump and close the valve of the cryopump (if present).
7. Have you read point 4? The detector has been retracted? Are you **REALLY** sure?
8. Retract and then close the shutter on the LEED apparatus, if you used it.
9. Stop the residual gas analyzer by switching off the SEM and the filament; Shut down high voltage and currents on all other equipments with heated filaments (Auger, sample heating...) that could break down in the gas atmosphere;

10. If it is the first time you use the sputter source, wash one or two times the gas line with Ar:
 - (a) close valve to roughing pump (turbo pump should be off, you can use the green valve on the plastic pipe for washing the line);
 - (b) open bottle valve, but leave the gas leak valve on the Ar line closed;
 - (c) close bottle valve;
 - (d) open gas leak valve and fill the gas line;
 - (e) pump down the full line;
 - (f) close the Ar gas line and repeat the procedure once again;
 - (g) leave the Ar gas line full and the bottle closed;
 - (h) close the right angle metal valve of the turbo pump and then fill the line with Ar. Close the Ar gas line.
 - (i) Leave the green valve between the turbo and the roughing pump open.
11. The gas line is full of Ar. A small Ar leak is already present through the VG valve. Now open slowly the valve to obtain $5 \cdot 10^{-6}$ mbar on the vacuum gauge. Never exceed $5 \cdot 10^{-5}$ mbar!
12. Turn on the control unit, if it has been turned off; push the operate button on the left side if you are in the standby state.
13. With the circular arrow button (second from the top on the left side) chose the voltage: you will see a small arrow on the right side pointing to the voltage value.
14. Rotate the wheel control placed on the right side of the screen to set the desired accelerating voltage (eg 1kV);
15. Select the Emission Current control and rotate the wheel to obtain the desired emission, typically set it to 10mA;
16. Verify the current on sample that should be close to 10 μ A. In case of doubt, adjust the sample position with x or θ to maximize the current.
17. To stop the source, turn off the emission, then the voltage, finally set the system in the standby state.
18. Close the leak valve on the ion source. Pump down the gas line opening the right angle metal valve (keep the line to the Ar bottle closed), this will prevent any residual leakage from the gas line into the chamber;
19. When the pressure is below $5 \cdot 10^{-8}$, you can safely open back the other pumps.
20. When the pressure is below $1 \cdot 10^{-8}$, you can turn on the RGA or any other equipment you turned off previously.