

SOP for Sputtering System

1. Vent the chamber
2. Remove the sample holder (metal plate that slides off) and load your samples. Make sure the target shutter is closed.
3. Make sure the vent, roughing, backing and gate valves are closed and the oil level in the rotary pump is adequate.
4. Switch on the mains, chiller, and roughing pump.
5. Slowly open the roughing valve to evacuate the chamber, switch on only the Pirani gauge (low vacuum gauge). Wait till pressure reaches 3×10^{-2} mbar.
6. Now close the roughing valve and slowly open the backing valve to evacuate the turbo section. Wait for 5 minutes. Then close the backing valve and again open the roughing valve.
7. If the pressure in the chamber is holding then close the roughing valve, open the backing valve and switch on the turbo controller.
8. Press start and wait for the turbo to reach max speed. Slowly open the gate valve by 20% (~4 rounds). Wait for 2 minutes.
9. Now switch on the penning gauge (high vacuum gauge) and fully open the gate valve. Wait for the pressure to reach 4×10^{-6} mbar (It should take approximately 20 minutes after the turbo reaches max speed)
10. Close the gate valve such that only 10% is open (the exact method would be shown in training)
11. Switch on the Argon MFC and set it to 20 sccm. Open the both Ar gas valve (tap) and you will see the pressure rise. Switch off the penning gauge.
12. Now switch on the RF auto tuner and RF power supply. Don't touch any other controls except the power knob. Increase the power by turning the knob slowly until plasma is achieved (~50W, if plasma is yet not achieved then don't increase more, slowly reduce the power to zero, and then assess the problem.
13. Once plasma ignites, Reduce the Ar flow to the desired pressure (~10 sccm) and start the O₂ flow (for NiO_x) at the desired flow rate.
14. Start substrate rotation and then open the target shutter. Start the timer.
15. Once sputtering is complete, close the target shutter and slowly reduce the RF power to zero. Set the MFCs to zero sccm each and then switch them off.
16. Close the gate valve fully and press "stop" on the turbo controller. Once the turbo has completely stopped (will take 15 minutes), switch off the rotary pump and close the backing valve.
17. Switch off the chiller and the mains and then vent the chamber.
18. Switch off substrate rotation and take the sample stage out. Replace it back once you have taken your samples.
19. Close the chamber door and start the rotary pump. Open the rouging valve and wait for 5 minutes. Then close the roughing valve and the rotary pump.