

X-Ray Diffraction SOP

- Turn ON the chiller (outside of building)
- Turn ON PC
- Turn ON the X-ray machine
 1. Turn on the red switch on left side of machine
 2. Push the green button on the left side of machine. If emergency button was pressed, it must be released before pressing the green button.
 3. When both buttons on the front left side of machine stop flashing and top button shows a vertical line, press the top button to align the X-ray. Button will start flashing in yellow then in blue for conditioning.
 4. When the flashing stops, top button should show a black fan with a solid yellow background & the bottom button is green. **Machine is ready to start measurement.**
**** It is preferred to let the conditioning be completed but if in a hurry, press blue flashing button to turn it to black fan on yellow**
- Set-up sample
 1. Prepare sample. Make sure it is tightly set.
 2. Open the XRD door by pressing the bottom button on the right side of the door. Top button will turn on the light inside the XRD chamber.
 3. Place sample in its designated place and press it up by pushing the metal shaft under it
 4. Install the Knife edge. Rotate the metal knob to adjust the knife and make sure it is not digging in to the sample. Knife must be barely touching. Close the door.
 5. Once test is done, press the release button in the back to remove sample
- Turn ON software
 1. Click on the XRD icon on bottom of screen
 - a) Username is Lab manager (no password). Click OK
 - b) If network server is not connected (not green), press on the MEAS icon on the bottom right side of screen. When server is connected, a green arrow icon will show up.
 2. Click on Davinci tab on top and check all info needed. Always check the slit # (1 mm)
 3. Click Commander tab on top

- a) If machine was shut-off, it must be initialized. Check Theta and Detector and press the blue check mark on the top right
 - b) Set the voltage to 40 KV and Current to 40 mA. Click "Set"
 - c) Set the time to 0.2
 - d) Set the 2Theta angle to 5° - 65°
 - e) Set the increment to 0.02
4. Click "Start"
 5. When test is done, click "Save" (disk icon under File)– Documents – Open existing folder or create a new one – Save as .brml and as .raw
- Eva
 1. Click File – import from file – Select file (.raw or .brml)
 2. Click Search/Match (scan) (under Tools in Left column)
 3. In Chemical Filter, you can filter any chemical.
 - a) Click Rebuild after every selection/change made in Chemical filter or other tabs
 4. Go to Database Filter – Check "PDF-4 +2016 RCB"
 5. Go to Candidate List – Click Search
 6. When closing Eva, do not save changes when prompted
- TOPAS
 1. File – Load Scan Files – Documents -- .raw file – Open
OR
 2. File name "RC" – Load STRs – OC/TOPAS/Structure Database/Cement – Structure – DB – Open – Select phase(s)
 3. Click Run Or Press F6
 4. Click "View" or F2 to show "Data Tree Panel" (bottom), "Data Property Panel (right), "Data Command Panel" (Left)
- Power Down
 1. Close down Eva & TOPAS (do not save any changes when prompted)
 2. Click on the XRD icon
 3. Go to "Commander" tab
 4. Change voltage to 20 KV and Current to 5 mA
 5. Click "Set"
 6. Turn off Generator switch (Top left button) on the front of the machine. It will start blinking. Wait until it shows a white button with a vertical blue line
 7. Close the XRD window on the computer
 8. Press Stand By button (Left side) of machine

** To turn off completely

1. Shut down PC
2. Turn off red switch on left side of machine
3. Switch off the chiller (outside of building)