

TRANSMISSION ELECTRON MICROSCOPE: ZEISS LIBRA 120

1. Removing grid holder from the TEM:
 - a. Open the vacuum control screen under the "Vacuum" tab on the software
 - b. Using two hands, place left hand on the specimen chamber on the column and use your right hand to grip the knob.
 - c. Slowly pull specimen rod partway out, making sure you do not exceed 6×10^{-6} mBar.
 - d. Turn counter-clockwise (CCW) until you hear a noise/click - STOP!!
 - e. Push in slightly, then turn CCW again until it stops.
 - f. Pull specimen holder all the way out.
2. Put grid(s) in the holder using appropriate tools. BE CAREFUL! Do not touch the specimen holder below the O-ring!!! Tighten the screw, but DO NOT over-tighten because you can strip the threads!
3. Put grid holder back into specimen chamber:
 - a. Again using two hands, align the peg on the holder to the opening in the chamber
 - b. Guide in carefully, but do not push it in forcefully. Again, DO NOT touch the base of the specimen holder as you're guiding it in!
 - c. Push the rod in a little bit and turn clockwise (CW). You will hear the pump go on. The red STOP light appears. Stop!!!
 - d. Wait for the red light to go off. Then, grasp knob and pull out slightly and then turn CW.
 - e. Push in and guide the holder into the chamber.
4. Adjust the grid position to either Grid 1 (all the way CW) or Grid 2 (all the way CCW) by loosening the small knob and rotating the larger knob CW or CCW. Tighten the smaller knob (if it is not tightened all the way you will not be able to move the specimen properly using the joystick!!)
5. Make certain you are on Low mag, the objective aperture is out (all the way CCW), the large screen (MS) is down and the small screen is down, Magnification is low, and brightness is down.
6. Turn the camera software on, but make sure the "live feed" is off- the screen should be grey. The camera temperature should be going down to -10°C .
7. Turn the filament from Standby to ON.
 - a. After filament turns on, you should see an image on the screen. If you don't, check:
 - i. The emission - should be >0 . Increase by 1 interval until image appears
 - ii. You could be focusing on the edge of a grid - move the specimen

- iii. Apertures could be out of alignment - See David or Lily
- b. Once you see the green light, use the X & Y knobs under Img. Shift to center it.
8. Scan your grid until you find your section. Put small screen down if it is not already there.
9. Use binoculars to focus in on specimen. Put your object of interest on the black dot on the small screen.
10. If area is suitable for imaging, insert Objective Aperture.
11. Use the X & Y knobs on the Objective Aperture to center the small green circle around the black dot on the small screen.
12. Switch to Hi Mag mode by pushing the MAG button on the right control board.
13. Adjust focus/brightness/stigmatism of your specimen.
14. When you are ready to take an image:
 - a. Raise large screen by pushing MB button
 - b. Click on the "video camera" icon to turn camera on
 - c. Once you see an image you can focus/adjust brightness/stigmatism (although the image should already be mostly in focus) & center your specimen on the screen (using the X & Y Img Shift knobs)
 - d. Put the cover on viewing screen (to eliminate the appearance of the camera scratches)
 - e. To take a picture click on the "Snapshot" icon next to the camera icon.
 - f. Once the picture has been taken it will appear on the left side of the screen in the small boxes.
 - h. Save file as a .tiff or .jpeg into the appropriate folder.
15. To go back to the TEM, click the camera button until the grey screen appears again.
16. Drop the large screen by pushing the MB button.
17. Continue to scan/focus/adjust/take images.
18. When finished:
 - a. keep the microscope on MAG mode.
 - b. turn off camera.
 - c. turn off filament.
 - d. put the sample holder back in the chamber after taking out of the samples. (if you're disposing of them, you can leave them in the TEM and they will be tossed next time the scope is used)
 - e. Cover the viewing screen and cover the sample holder box
19. SIGN THE LOG BOOK!!!!