

Best Practices for Utilizing Cryo Equipment



A Live Zoom 'Tech Talk' Presented by
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11:00 a.m. CST

Welcome To 2021

- First Tech Talk for 2021, déjà vu
- Perspective
- List of Equipment
- Cryo Storage
- New Concepts On Old Practices

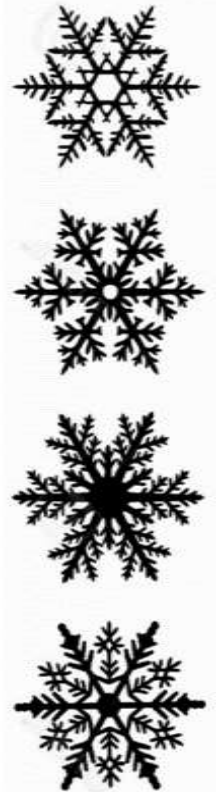
**Challenges:
Cryo Holders & Workstations**

- Requires strong TEM skills. What can go wrong, will go wrong.
- Delicate.
- Very Expensive.
- Variety of capabilities.



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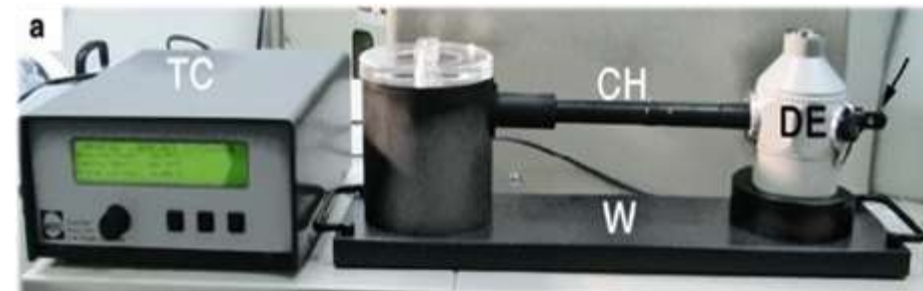
Historical Perspectives

Objectives

Challenges

Equipment

- 2 Vitroblots: FEI Mark IV in Hogan 5-120, FEI MARK III in Tech A/B.
- 3 Gatan CTH and workstation; Hitachi 626 in Tech A/B, JEOL 626 in Hogan 5-120.
- 2 Gatan 655 Dry Pumping Stations: Tech A/B and Hogan 5-120.
- 3 Temperature Controllers: Hogan JEOL TEM room, Hogan 5-120 behind the Dry Pumping Station or on the Cryo Cart and Tech A/B above the Dry Pumping Station.
- LN2 tanks and Dewars of various sizes.
- Transfer and Storage Supplies; sticks, grid boxes, cryo box.
- 2 Cryo TEM: JEOL 1230 in Hogan 5-120 and Hitachi HD7700 in Tech A/B



New Concepts, Outdated Practices

Workstation Challenges

- Do not force anything if it is frozen.
- Cooling down the holder in the workstation takes about 15 minutes. Cooling down in the TEM takes about 30 minutes.
(Grid is left in the holder for 2 reasons)
- Positioning and removing the aluminum insert.
- Using the acrylic lid for cooling and grid exchange.
- CTH freezing in the workstation. Wedge
- Boiling at the grid.
- Do not leave your grid box in the workstation while imaging, move it back to a storage container.
- Warm the plug and dry it off before putting it back into the workstation.



New Concepts, Outdated Practices

CTH Preventative Measures

- Foam wedge vs foil insert
- Shield
- Cooling the tools
- The goniometer is tilted when inserting or removing the CTH and watching the vacuum recovery.
- 75% of what you do is preventative



New Concepts, Outdated Practices

CTH Details

- 2 types of cliprings, tools:
treading vs butterfly
- Check the tension of the clipring
- Shield
- Cold Finger/ACD cooling
- Check the temperature of the CTH
- Debubbling the dewar
- LN2 juggling



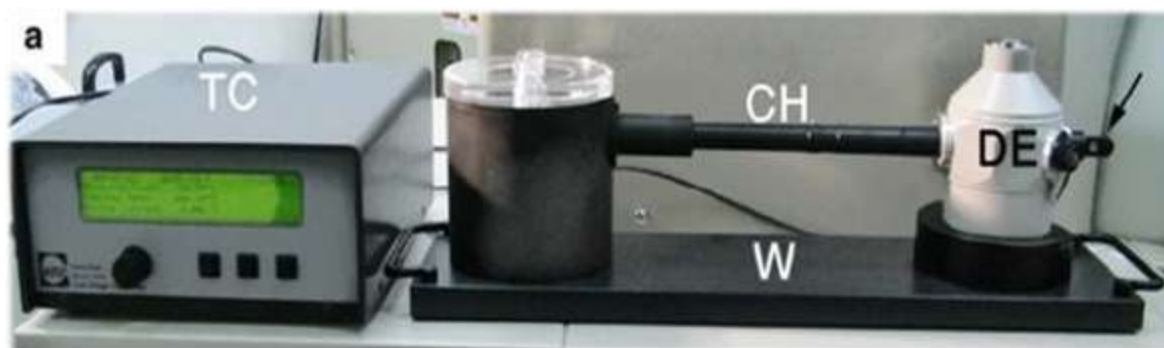
FEI Instructions web link

http://cbi.ibp.ac.cn/workshop/workshop2015/workshop2015_may/files/Documents/FEI%20material/How%20to%20handle%20cryo%20holders%20Gatan.pdf

New Concepts, Outdated Practices

Dry Pumping Station

- Tip Warm-up instructions
- Bake-out based on use and temperature -173C
- Screw and notch
- Upside down
- V1-V4





Thank you

Q&A