| **6/12/2023** |  | | | |
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| Objectives | Practice SEM procedure and taking 3D images. Followed Kayden’s metadata sheet from 2020-08-05  Resolution 1260x960, 20 sec | | | |
| Accomplishments/  Reflections | It seems like the hexagonal prism shapes form best at low temperatures, but at these colder temperatures the crystals are growing too quickly to image well  20 sec is the fastest image capturing speed (I think this is for all 4, meaning 5s per image)  For future:  -Find and calibrate all crystals first. Water vapor forms more readily on already developing crystals so it’s unlikely that new ones will form after much time has gone by.  -See if you can slowly lower temperature at a rate of 0.5C per minute following 2017 Quantitative 3D paper, I think this will produce higher quality crystals  -Set pressure to 50 (we had 40) since 50 is the nominal operating pressure | | | |
| Cold stage size | | 51 mm | | |
| Cold stage height | | +8 mm | | |
| Distance of detector from stage  (5-10mm) | | 5 mm | | |
| Probe current (70-90) | | 85 | | |
| Accelerating voltage (Vacc) (12-17kV) | | 12 k/v | | |
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| Time | Action/observation | Temperature | Pressure (25-150 Pa, 40 most common) | Working Distance  (3 factors: focus, mag, stage height)  Error message if not from 9-11 mm |
| 4:32 | Set temp to -43 | 26 | 70 |  |
| 4:32 |  | 0 | 60 |  |
| 4:40 | Crystal observed | -38 | 50 |  |
| 4:41 | Set temp to -32 to slow growth |  |  |  |
| 4:45 | Preparing to take 3D image | -32.8 | 50 | 9.2 mm |
| 4:51 | Taking images | -32.1 | 50 |  |
| 4:55 | Set temp to -43 again to grow fresh crystals (last one was rough) |  |  |  |
| 5:03 | New crystal found |  | 40 |  |
| 5:04 | Set temp to -32 to slow growth  More lumpy than hexagonal |  | 50 |  |
| 5:07 | Take image  Seems like crystal is ablating | -32 | 50 | 9.0 |
| 5:14 | Lower temp down to -45 (what we had in training), want to see if colder temperatures result in less “lumpy” shapes, more hexagonal | -32.7 | 40 |  |
| 5:19 | Imaging the second crystal again, it looked like it had shattered from temperature changes. Defined hexagons in each of the shattered pieces  It was definitely growing and smoothing out as we imaged it | -38 | 40 | 9.0 |
| 5:25 | Imaging a third crystal, which started growing around the same time as our first crystal | -37 | 40 | 9.2 |
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