| **6/27/23** |  | | | |  |
| --- | --- | --- | --- | --- | --- |
| Objectives | Continue collecting images of crystals with recorded temperature and pressure to use for data in roughness/temp/pressure model. | | | |  |
| Accomplishments/  Reflections | * Maybe consider including change of temperature in statistical models going forward. Seems to play a large role in ablation. For example, if you grow a crystal at 36 and then image it at 32, compare that to a crystal grown at 40 and imaged at 36. | | | |  |
| Cold stage size | | 51 mm | | |  |
| Cold stage height | | +8 mm | | |  |
| Distance of detector from stage  (5-10mm) | | 5 mm | | |  |
| Probe current (70-90) | | 70 | | |  |
| Accelerating voltage (Vacc) (12-17kV) | | 12 k/v | | |  |
|  | | | | |  |
| 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 | Magnifi-  cation |
| 10:44 | Good morning! Cooling the environment to begin the process per usual. | -31 | 50 |  |  |
| 10:53 | Very hexagonal crystal that got a little lumpy before I could image. But still shows promise for calibration (case 1.0). **Note: crystal was still growing during imaging.** | -39.4 | 50 | 8.8 | x120 |
| 10:57 | Raised temp and lots of roughness is visible, along with cracks along pyramidal facets (case 1.1). **Note: crystal was still growing during imaging.** | -38.3 | 50 | 8.7 | x85 |
| 11:00 | Crystal has filled out a lot. Evidence of ablation can be seen with pyramidal facets becoming very lumpy. (case 1.2). **Note: crystal was still growing during imaging.** | -36.4 | 50 | 8.4 | x65 |
| 11:04 | Similar trend of ablation as last image. Increased temperature and imaged again. (case 1.3). **Note: crystal was still growing during imaging.** | -34.6 | 50 | 8.4 | x65 |
| 11:06 | Crystal fully joined another nearby one as it continued growing. Going to evaporate/disintegrate/vaporize or whatever it is and go again for trial 2 :) |  |  |  |  |
| 11:15 | Take 2, cooling the stage to start. | -31 | 50 |  |  |
| 11:17 | Going to -40 again, as it seemed to work well for me last time. Hoping to image more quickly this time for better calibration results. |  |  |  |  |
| 11:28 | None of the crystals that formed seemed promising. The coldstage temperature also hovered around -38, even though I asked it for -40 which was odd. Going to reset and shoot for -42 in hopes of some cooler temperatures to start with. |  |  |  |  |
| 11:38 | Going again. | -31 | 50 |  |  |
| 11:40 | Turning down temp with target of -42. | -35.0 & dropping | 50 |  |  |
| 11:47 | All the crystals that showed promise grew with immediate significant roughness. Going to try again :/ |  |  |  |  |
| 11:57 | Lowering temperature to -31. |  |  |  |  |
| 12:03 | Lowering to -38 this time. |  |  |  |  |
| 12:10 | Promising crystal. Unfortunately on the edge of the copper plate, but seems usable. (case 2.0). | -38.3 | 50 | 8.8 | x65 |
| 12:13 | Raised temp and reimaged (case 2.1). Some roughness becoming more prominent between basal and pyramidal facets. | -37.4 | 50 | 8.9 | x65 |
| 12:16 | Lots of linear roughness on edges of pyramidal facets, and some overflowing into the basal facet. Crystal appears to be flattening with signs of ablation along pyramidal edges. (case 2.2) | -36.4 | 50 | 8.8 | x65 |
| 12:19 | More defined roughness on the pyramidal facets, but not much change elsewhere as crystal continues to flatten and ablate (case 2.3). | -35.5 | 50 | 8.6 | x65 |
| 12:23 | Lots of roughness, but extremely horizontal linear throughout the entire crystal’s surface. Crystal continues to flatten and ablate as facets begin to combine. (case 2.4) | -33.6 | 50 | 8.8 | x65 |
| 12:27 | Final image of crystal (case 2.5) | -32.7 | 50 | 8.8 | x65 |
|  |  |  |  |  |  |