| **6/12/2023** |  | | | |  |
| --- | --- | --- | --- | --- | --- |
| Objectives | Continue on with techniques we practiced yesterday of increasing the temperature gradually and incrementally. We are hoping to form crystals that can be used for calibration at the very least today. | | | |  |
| Accomplishments/  Reflections |  | | | |  |
| 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 | Magnification |
| 9:42 | We’re curious if crystals form more hexagonally when subject to colder initial conditions. | Set to -31, then to -40 | 40 |  |  |
| 9:45 | Couple of crystals forming. The second one we saw looks promising for calibration. Captured a snapshot of it (case 1.0). | -40 | 50 | 9.2 |  |
| 9:47 | Many more crystals forming. Another crystal seems to be calibratable as well, captured a normal image (case 2.0). | -39 | 50 | 8.7 |  |
| 9:52 | Captured third image for potential calibration (case 3.0). A couple of crystals were showing lots of roughness as we searched around. | -38 | 50 | 9.4 |  |
| 9:58 | Returned to the second crystal for roughness images (case 2.1). Seeing lots of parallel roughness, rather than random roughness marks. | -37 | 50 | 9.4 |  |
| 10:00 | Returned to third crystal for roughness images (case 3.1). Overall more parallel roughness but some spots of random roughness. | -37 | 50 | 9.4 |  |
| 10:23 | Started from scratch with a second run through. Found lots of crystals, and found one that looks like our best yet. Very smooth facets initially, which we captured in a snapshot (case 4.0). **Note: crystal was still growing during imaging.** | -38.9 | 50 | 9.0 |  |
| 10:26 | Raised the temperature to provoke some roughness. Capturing a normal image of the same crystal (case 4.1). **Note: crystal was still growing during imaging.** | -37.3 | 50 | 9.0 |  |
| 10:29 | Capturing a third image of the crystal (case 4.2). Seeing some visible parallel roughness as well as patches of random roughness. **Note: crystal was still growing during imaging.** | -36.4 | 50 | 9.0 |  |
| 10:35 | Capturing a fourth image of the crystal (case 4.3). Seeing cases of curved roughness from ablation. | -32.6 | 50 | 9.0 |  |
| 10:36 | Fifth image (case 4.4). Seeing ablation of the crystal. Peaks are sharpening, and the edges between them are starting to curve and bow in. Facets between these peaks are showing visible roughness. | -31.7 | 50 | 9.0 |  |
| 10:41 | Sixth image (case 4.5). Lowered temperature back down to explore roughness that occurs from growing after ablation. | -34.6 | 50 | 9.0 |  |
| 10:55 | Starting third run through. Temperature is at 39.3, and we are seeing a lot of crystals that look promising. | -39.3 | 50 |  |  |
| 10:57 | Selected one of the promising crystals. Took a snapshot to capture initial smoothness and multiple distinctive facets (case 5.0). Also obtained a normal image (case 5.1). **Note: crystal was still growing during imaging.** | -37.5 | 50 | 9.0 |  |
| 11:03 | Captured another normal image of the crystal (case 5.2). Seeing some interesting/unique roughness on the left side of the crystal. | -34.6 | 50 | 9.0 |  |
| 11:09 | Capturing fourth image (case 5.3). Ablation is beginning to occur, as well as parallel roughness running horizontally across the crystal. | -33.7 | 50 | 9.1 |  |
| 11:15 | Fifth image (case 5.4). Lots of roughness, mostly parallel. Signs of ablation in the bottom half of the crystal, especially on the left side. | -31.8 | 50 | 9.1 |  |
| 11:29 | Starting our fourth run through. Finding a couple of crystals that are forming nicely, selecting between them. | -39.5 | 50 |  |  |
| 11:30 | Selected a hexagonal crystal that shows promise for calibration. Captured a normal image (case 6.0). However, as the image went on, the crystal seemed to gain some roughness fairly quickly. **Note: crystal was still growing during imaging.** | -39.5 | 50 | 9.0 |  |
| 11:33 | Second image (case 6.1). Seeing some scattered rough areas, mostly in the bottom left and top right sections. | -36.4 | 50 | 9.1 | 95x |
| 11:35 | Third image (case 6.2). Crystal has grown in height and gained some roughness around the edges. | -35.1 | 50 | 9.1 | 90x |
| 11:40 | Case 6.3. Ablation starting to occur in the form of jagged edges. | -31.8 | 50 | 9.1 | 90x |
|  |  |  |  |  |  |