| **7/20/2023** |  | | | |  |
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| Objective | Continue on the path we started on Tuesday by modeling what we predict would be the life of an ice crystal within a cirrus cloud. Today we will work with pressures of 50 and potentially 70 pascals if everything goes to plan! | | | |  |
| Accomplishment/  Reflection |  | | | |  |
| 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 (Since start of trial) | 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 |
|  | Lowering the temperature to -40°, hopefully. |  |  |  |  |
| 0:00 | Located a slanted crystal with prismatic and basal facets both visible from top view. Close to edge but still seems usable. (case 1.0). **Note: crystal was still growing during imaging.** | -37.3 | 50 | 8.9 | x140 |
|  | We decided that the crystal was growing too quickly, and had too much visible roughness on the initial image to be used for calibration. Going to reset the process and go again. |  |  |  |  |
| 0:00 | Imaging another crystal on the edge of the copper stub (case 2.0). **Note: crystal was still growing during imaging.** | -36.7 | 50 | 8.8 | x90 |
| 3:14 | Capturing second image. Crystal seems to be flattening with visible roughness along prismatic facets and beveled surface (case 2.1). **Note: crystal was still growing during imaging.** |  | 50 | 9.0 | x85 |
| 5:10 | Capturing third image (case 2.2). | -32.6 | 50 | 9.0 | x80 |
| 7:20 | Capturing fourth image (case 2.3). Ablation starting to become visible | -30.7 | 60 |  |  |
| 9:14 | Fifth image (case 2.4). Larger and much rougher ridges along the prismatic facet. | -29.0 | 60 |  |  |
| 11:04 | Sixth image (case 2.5). Crystal has shrunk down and is almost gone. | -27.4 | 70 |  |  |
|  | Wrapping up session now. Going to come back and continue in the afternoon. |  |  |  |  |
|  | Restarting session with a trial at 50pa. |  |  |  |  |
| 0:00 | Top left. New crystal found. Basal facet facing up (case 3.0). **Note: crystal was still growing during imaging.** | -35.0 | 50 | 8.8 | x230 |
| 2:46 | Second image. Some roughness, primarily on the beveled surface. Basal facet is shrinking and the beveled surface is growing in area. (case 3.1). **Note: crystal was still growing during imaging.** | -34.4 | 50 |  | x120 |
| 4:57 | Case 3.2: More roughness in the pyramidal facet. **Note: crystal was still growing during imaging.** | -32.4 | 50 |  | x95 |
| 6:40 | *Case 3.3*: Signs of early ablation, especially in the top right pyramidal facet. | -30.5 | 50 |  | x80 |
| 8:45 | *Case 3.4:* Roughness in the basal facet is forming. It looks like it crept in from the beveled surface, as the roughness on the two sections have similar patterns. Definite ablation. | -28.9 | 60 |  |  |
| 10:45 | *Case 3.5*: Crystal starting to deform at edges. | -27.0 | 70 |  |  |
|  | Lowering the temperature now to try and keep the crystal alive for imaging. Reached equilibrium around -32 to -33 as the crystal stopped shrinking. |  |  |  |  |
|  | Crystal has started growing again at -35°. Other small crystals are becoming visible around the edges. |  |  |  |  |
|  | *Case 3.6*: Crystal has reformed some of its shape, but has lots of grooves and canyons on all different surface sections. | -35.6 |  |  |  |
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