**-** Supporting Online Material **–**

**Geochemistry of calcite and dolomite in the Middle Bakken Formation, USA.**

Mark Brodie1, Andrew Aplin1, Bruce Hart2, Ian Orland3, John Valley3, Adrian Boyce4  
 1Department of Earth Sciences, Durham University, UK, DH1 3LE.   
2Statoil, Austin, TX 78730, United States.  
3Department of Geoscience, University of Wisconsin-Madison, WI, USA.  
4SUERC, Rankine Avenue, East Kilbride, G75 0QF.

# Ion Microprobe Analysis of Carbonate Minerals

*In situ* oxygen isotope data were acquired in the WiscSIMS Laboratory at the University of Wisconsin–Madison by a CAMECA IMS 1280 large-radius multicollector ion microprobe (Kita et al., 2009, Valley and Kita 2009). Carbonate minerals calcite and dolomite were analyzed during four analytical sessions in October 2016 (Table 1). During the analytical sessions the 133Cs+ primary ion beam had an intensity of ̴ 1.4 nA generating a beam diameter of ̴ 13 µm. The values reported here are uniformly lowered 0.2 nA from the true primary beam current as a result of a small fraction of electrons from the E-gun being collected by the primary beam Faraday cup. The typical secondary 16O‑ ion intensity was ̴̴ 2.9x109 cps. Measurements were performed in multi-collector Faraday Cup mode and with conditions similar to those reported by Kozdon et al. (2009). The secondary O‑ ions (16O‑, 16O1H-, 18O-) were detected by Faraday cup. Charging of the sample surface was compensated by Au-coating and an electron flood gun. Grains of the University of Wisconsin calcite standard, UWC-3 [δ18O(VSMOW) of UWC-3 is 12.49‰ (±0.03‰ 1 SD, n= 9)] was mounted at the centre of sample mounted in the polished block (Kozdon et al., 2009). Four consecutive measurements of UWC-3 calcite standard were performed before and after every set of 8–17 sample analyses. The 2 SD of a set of bracketing standard analyses is assigned as the reproducibility of the bracketed sample analyses. Detailed analytical protocols are described in Kita et al. (2009).

**References**

KITA, N.T., USHIKUBO, T., FU, B., AND VALLEY, J.W., 2009, High Precision SIMS Oxygen Isotope Analyses and the Effect of Sample Topography: Chemical Geology*,* v. 264, p. 43-57.

KOZDON, R., USHIKUBO, T., KITA, N. T., SPICUZZA, M., AND VALLEY, J. W., 2009, Intratest oxygen isotope variability in the planktonic foraminifer N. pachyderma: Real vs. apparent vital effects by ion microprobe: Chemical Geology, v. 258, p. 327-337.

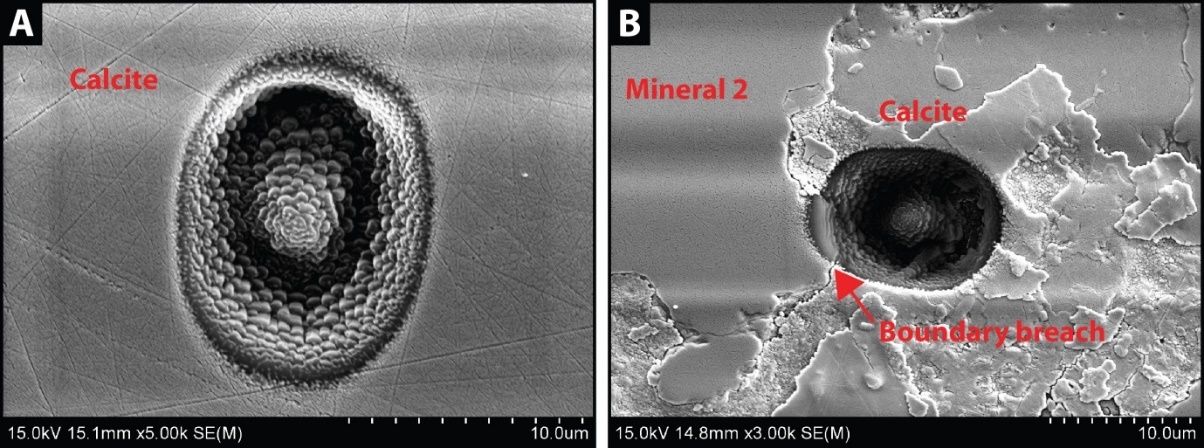
VALLEY, J.W., AND KITA, N.T., 2009, *In situ* Oxygen Isotope Geochemistry by Ion Microprobe, *in* Fayek M., *ed*., MAC Short Course: Secondary Ion Mass Spectrometry in the Earth Sciences, v. 41, p. 19-63

**Table S1 –** Full details of SIMS & SEM-WDS analyses for individual crystals. Data not included in the plots and interpretation are also included to show the full bracketed analyses. External precision (reproducibility) is reported for each bracket. The ‘Mineral/ Type/Comment’ column gives details of the analysis including dolomite phase type as a number e.g. type 1 is ‘1’, NF=Crystal was not found post-SIMS analysis, NC= Crystal was not composed of a carbonate mineral, Calcite = calcite crystal.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Sample ID | 16O (Gcps) | δ18O ‰ measured | | | 2SE (int.) | | Mass Bias | δ18O ‰ VSMOW | δ18O ‰ PDB | 2SD (ext.) | OH/O | Mineral / Type / Comment | CaO | MgO | FeO |
| **Sample Mount No. 2. 13 µm beam, 1.2 nA intensity. October 6th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 1 | 2 UWC3 G1 | 2.99 | | 5.22 | | 0.45 | |  |  |  |  |  |  |  |  |  |
| 2 | 2 UWC3 G1 | 3 | | 5.04 | | 0.45 | |  |  |  |  |  |  |  |  |  |
| 3 | 2 UWC3 G1 | 3.01 | | 5.19 | | 0.53 | |  |  |  |  |  |  |  |  |  |
| 4 | 2 UWC3 G2 | 2.97 | | 5.2 | | 0.5 | |  |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 5 | 2-004 | 3.14 | | 14.29 | | 0.47 | | -12.28 | 26.9 | -3.85 | 0.21 | 0.003 | 2 | 51.93 | 51.44 | 0 |
| 6 | 2-005 | 3.07 | | 15.38 | | 0.45 | |  |  |  | 0.21 | 0.005 | NF |  |  |  |
| 7 | 2-006 | 3.01 | | 13.75 | | 0.46 | | -12.28 | 26.36 | -4.37 | 0.21 | 0.001 | 1 | 54.93 | 53.06 | 0.7 |
| 8 | 2-007 | 2.01 | | 7.94 | | 0.27 | | -5.41 | 13.41 | -16.93 | 0.21 | 0.001 | NC |  |  |  |
| 9 | 2-008 | 2.91 | | 13.95 | | 0.53 | | -12.28 | 26.56 | -4.18 | 0.21 | 0.002 | 3 |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 10 | 2 UWC3 G1 |  | | 5.34 | | 0.54 | |  |  |  |  |  |  |  |  |  |
| 11 | 2 UWC3 G1 |  | | 5.34 | | 0.47 | |  |  |  |  |  |  |  |  |  |
| 12 | 2 UWC3 G1 |  | | 5.15 | | 0.54 | |  |  |  |  |  |  |  |  |  |
| 13 | 2 UWC3 G1 |  | | 5.13 | | 0.56 | |  |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.2** | | **2SD:** | | **0.21** |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 14 | 2-009 | 2.15 | | 7.02 | | 0.22 | | -5.41 | 12.5 | -17.81 | 0.25 | 0.002 |  | 39.95 | 61.79 | 0.0 |
| 15 | 2-009-2 | 2.04 | | 8.14 | | 0.3 | | -5.41 | 13.63 | -16.72 | 0.25 | 0.004 | NC |  |  |  |
| 16 | 2-009-3 | 2.12 | | 10.04 | | 0.23 | | -5.41 | 15.54 | -14.87 | 0.25 | 0.005 | NC |  |  |  |
| 17 | 2-011 | 3.09 | | 13.41 | | 0.39 | | -11.64 | 25.35 | -5.35 | 0.25 | 0.005 | 2 | 36.69 | 63.31 | 0.5 |
| 18 | 2-012 | 3.07 | | 14.41 | | 0.71 | | -12.3 | 27.05 | -3.70 | 0.25 | 0.006 | 1 | 39.16 | 62.72 | 0.0 |
| 19 | 2-013 | 3.05 | | 14.15 | | 0.45 | | -12.3 | 26.78 | -3.96 | 0.25 | 0.008 | 2 |  |  |  |
| 20 | 2-017 | 2.89 | | 17.4 | | 0.45 | | -11.64 | 29.39 | -1.43 | 0.25 | 0.004 | 3 | 39.98 | 61.04 | 0.6 |
| 21 | 2-018 | 2.07 | | 7.9 | | 0.29 | | -5.41 | 13.38 | -16.96 | 0.25 | 0.006 | NC |  |  |  |
| 22 | 2-061 | 2.08 | | 10.35 | | 0.52 | | -5.41 | 15.85 | -14.56 | 0.25 | 0.006 | NC |  |  |  |
| 23 | 2-021 | 2.09 | | 7.01 | | 0.32 | | -5.41 | 12.49 | -17.82 | 0.25 | 0.005 | NC |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 24 | 2 UWC3 G1 | 2.85 | | 5.13 | | 0.47 | |  |  |  |  |  |  |  |  |  |
| 25 | 2 UWC3 G1 | 2.81 | | 5.29 | | 0.5 | |  |  |  |  |  |  |  |  |  |
| 26 | 2 UWC3 G1 | 2.9 | | 5.01 | | 0.48 | |  |  |  |  |  |  |  |  |  |
| 27 | 2 UWC3 G1 | 2.96 | | 5.08 | | 0.47 | |  |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.18** | | **2SD:** | | **0.25** |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 28 | 2-022 | 3.19 | | 13.42 | | 0.49 | |  |  |  | 0.18 | 0.006 | NF |  |  |  |
| 29 | 2-022a | 3.17 | | 12.32 | | 0.43 | | -12.33 | 24.96 | -5.73 | 0.18 | 0.002 | 2 | 41.56 | 59.51 | 0.1 |
| 30 | 2-022b | 3.03 | | 16.59 | | 0.49 | | -12.33 | 29.28 | -1.54 | 0.18 | 0.002 | 2 |  |  |  |
| 31 | 2-024 | 3.06 | | 12.81 | | 0.43 | | -12.33 | 25.46 | -5.24 | 0.18 | 0.003 | 4 | 38.9 | 61.14 | 0.1 |
| 32 | 2-025 | 3.05 | | 13.18 | | 0.5 | | -12.33 | 25.83 | -4.88 | 0.18 | 0.004 | 3 | 37.46 | 62.69 | 0.1 |
| 33 | 2-026 | 3.11 | | 12.2 | | 0.45 | | -10.93 | 23.38 | -7.26 | 0.18 | 0.001 | 2 | 43.13 | 56.1 | 1.1 |
| 34 | 2-027 | 2.08 | | 15.05 | | 0.28 | | -5.45 | 20.61 | -9.95 | 0.18 | 0.010 | NF |  |  |  |
| 35 | 2-028 | 3.2 | | 15.79 | | 0.53 | | -9.57 | 25.6 | -5.11 | 0.18 | 0.002 | 2 | 39.87 | 69.81 | 2.9 |
| 36 | 2-028a | 2.09 | | 6.97 | | 0.22 | | -5.45 | 12.48 | -17.83 | 0.18 | 0.001 | NC |  |  |  |
| 37 | 2-029 | 3.01 | | 18.6 | | 0.49 | | -10.93 | 29.86 | -0.97 | 0.18 | 0.004 | 1 | 38.61 | 60.56 | 1.0 |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 38 | 2 UWC3 G1 | 2.84 | | 5.12 | | 0.5 | |  |  |  |  |  |  |  |  |  |
| 39 | 2 UWC3 G1 | 2.82 | | 5.13 | | 0.57 | |  |  |  |  |  |  |  |  |  |
| 40 | 2 UWC3 G1 | 2.9 | | 5.26 | | 0.45 | |  |  |  |  |  |  |  |  |  |
| 41 | 2 UWC3 G1 | 2.93 | | 5.17 | | 0.45 | |  |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.15** | | **2SD:** | | **0.18** |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 42 | 2-030 | 2.99 | | 14.99 | | 0.38 | |  |  |  | 0.14 | 0.014 | NF |  |  |  |
| 43 | 2-031 | 3.19 | | 18.44 | | 0.53 | |  |  |  | 0.14 | 0.014 | NF |  |  |  |
| 44 | 2-032 | 2.98 | | 14.85 | | 0.5 | |  |  |  | 0.14 | 0.014 | NF |  |  |  |
| 45 | 2-033 | 3.12 | | 15.97 | | 0.39 | | -12.28 | 28.6 | -2.20 | 0.14 | 0.006 | 4 | 41.41 | 59.02 | 0.1 |
| 46 | 2-034 | 2.86 | | 17.24 | | 0.58 | |  |  |  | 0.14 | 0.003 | NF |  |  |  |
| 47 | 2-035 | 3.07 | | 13.65 | | 0.53 | |  |  |  | 0.14 | 0.007 | NF |  |  |  |
| 48 | 2-036 | 2.94 | | 15.39 | | 0.49 | |  |  |  | 0.14 | 0.004 | NF |  |  |  |
| 49 | 2-036a | 2.95 | | 14.78 | | 0.42 | | -12.28 | 27.39 | -3.37 | 0.14 | 0.004 | 4 | 42.72 | 57.84 | 1.7 |
| 50 | 2-038 | 3 | | 12.82 | | 0.57 | |  |  |  | 0.14 | 0.005 | NF |  |  |  |
| 51 | 2-039 | 3.02 | | 12.82 | | 0.52 | | -12.28 | 25.41 | -5.29 | 0.14 | 0.002 | 4 | 36.21 | 64.25 | 0.0 |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 52 | 2 UWC3 G1 | 2.82 | | 5.31 | | 0.51 | |  |  |  |  |  |  |  |  |  |
| 53 | 2 UWC3 G1 | 2.8 | | 5.27 | | 0.58 | |  |  |  |  |  |  |  |  |  |
| 54 | 2 UWC3 G1 | 2.89 | | 5.22 | | 0.53 | |  |  |  |  |  |  |  |  |  |
| 55 | 2 UWC3 G1 | 2.94 | | 5.16 | | 0.49 | |  |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.2** | | **2SD:** | |  |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 56 | 2-040 | 3.12 | | 14.48 | | 0.52 | | -12.32 | 27.13 | -3.62 | 0.31 | 0.006 | 3 | 39.35 | 60.59 | 0.2 |
| 57 | 2-041 | 3.16 | | 14.53 | | 0.49 | |  |  |  | 0.31 | 0.005 | NF |  |  |  |
| 58 | 2-042 | 3.11 | | 14.52 | | 0.52 | | -12.32 | 27.18 | -3.57 | 0.31 | 0.002 | 3 | 36.17 | 63.79 | 0.3 |
| 59 | 2-043 | 3.04 | | 15.06 | | 0.49 | |  |  |  | 0.31 | 0.004 | NF |  |  |  |
| 60 | 2-043a | 3.03 | | 16.69 | | 0.39 | | -12.32 | 29.37 | -1.45 | 0.31 | 0.004 | 2 | 36.92 | 63 | 0.1 |
| 61 | 2-044 | 3.12 | | 12.89 | | 0.58 | | -11.66 | 24.84 | -5.84 | 0.31 | 0.002 | 3 | 40.59 | 59.44 | 0.6 |
| 62 | 2-045 | 3.06 | | 13.27 | | 0.45 | |  |  |  | 0.31 | 0.003 | NF |  |  |  |
| 63 | 2-046 | 2.95 | | 15.55 | | 0.43 | | -12.32 | 28.22 | -2.56 | 0.31 | 0.005 | 3 | 36.21 | 63.65 | 0.0 |
| 64 | 2-047 | 3.03 | | 13.84 | | 0.42 | | -12.32 | 26.49 | -4.24 | 0.31 | 0.002 | 3 | 36.81 | 63.64 | 0.0 |
| 65 | 2-048 | 2.98 | | 15.19 | | 0.43 | | -2.21 | 17.44 | -13.02 | 0.31 | 0.006 | 2 | 38.17 | 60.2 | 0.0 |
| 66 | 2-049 | 3.03 | | 14.03 | | 0.58 | | -12.32 | 26.68 | -4.06 | 0.31 | 0.002 | 3 | 39.55 | 61.79 | 0.1 |
| 67 | 2-081 | 2.72 | | 16.58 | | 0.49 | | -12.32 | 29.26 | -1.56 | 0.31 | 0.002 | 2 | 39.07 | 61.38 | 0.0 |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| 68 | 2 UWC3 G1 | 2.83 | | 4.82 | | 0.5 | |  |  |  |  |  |  |  |  |  |
| 69 | 2 UWC3 G1 | 2.82 | | 5.27 | | 0.49 | |  |  |  |  |  |  |  |  |  |
| 70 | 2 UWC3 G1; Cs 127-128 | 2.92 | | 5.13 | | 0.52 | |  |  |  |  |  |  |  |  |  |
| 71 | 2 UWC3 G1 | 2.96 | | 5.13 | | 0.53 | |  |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.16** | | **2SD:** | | **0.31** |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |
| **Sample Mount No. 3. 13 µm beam, 1.2 nA intensity. October 6th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 72 | 3 UWC3 G1 | 2.94 | | 5.02 | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 73 | 3 UWC3 G1 | 2.94 | | 5.1 | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 74 | 3 UWC3 G2 | 2.92 | | 5.02 | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 75 | 3 UWC3 G2 | 2.89 | | 5.31 | | 0.49 |  | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 76 | 3-012 | 2.05 | | 4.78 | | 0.34 | -5.4 | | 10.23 | -20.02 | 0.33 | 0.001 | NC |  |  |  |
| 77 | 3-015 | 2.94 | | 14.77 | | 0.77 | -11.63 | | 26.72 | -4.02 | 0.33 | 0.004 | 2 | 52.64 | 47.32 | 0.2 |
| 78 | 3-016 | 3.03 | | 13.9 | | 0.5 | -11.63 | | 25.83 | -4.88 | 0.33 | 0.001 | 1 | 51.65 | 48.27 | 0.4 |
| 79 | 3-017 | 3 | | 16.62 | | 0.49 | -11.63 | | 28.59 | -2.21 | 0.33 | 0.003 | 3 | 50.81 | 48.94 | 0.0 |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 80 | 3 UWC3 G1 | 2.84 | | 5.3 | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 81 | 3 UWC3 G1 | 2.83 | | 5.49 | | 0.56 |  | |  |  |  |  |  |  |  |  |
| 82 | 3 UWC3 G1 | 2.94 | | 5.13 | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 83 | 3 UWC3 G1 | 2.95 | | 5.18 | | 0.49 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.19** | | **2SD:** | **0.33** | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 84 | 3-018 | 3.19 | | 16.43 | | 0.41 | -12.19 | | 28.97 | -1.84 | 0.29 | 0.001 | 2 | 50.64 | 49.55 | 0.1 |
| 85 | 3-021 | 2.98 | | 15.19 | | 0.44 | -12.19 | | 27.71 | -3.06 | 0.29 | 0.003 | 4 | 53.39 | 46.96 | 0.1 |
| 86 | 3-022 | 2.98 | | 12.54 | | 0.43 | -11.53 | | 24.35 | -6.32 | 0.29 | 0.003 | 3 | 50.75 | 48.8 | 0.4 |
| 87 | 3-023 | 2.94 | | 13.38 | | 0.53 | -12.19 | | 25.88 | -4.83 | 0.29 | 0.005 | 2 | 50.85 | 49.03 | 0.0 |
| 88 | 3-024 | 2.87 | | 14.03 | | 0.39 | -12.19 | | 26.54 | -4.19 | 0.29 | 0.004 | 1 | 52.43 | 48.64 | 0.0 |
| 89 | 3-025 | 3.07 | | 17.98 | | 0.45 | -8.83 | | 27.04 | -3.71 | 0.29 | 0.002 | 4 | 53.58 | 44.76 | 0.0 |
| 90 | 3-026 | 2.65 | | 16.98 | | 0.54 | -12.19 | | 29.53 | -1.29 | 0.29 | 0.002 | 3 | 98.6 | 1.33 | 0.2 |
| 91 | 3-026a | 2.83 | | 14.72 | | 0.45 | -11.53 | | 26.55 | -4.18 | 0.29 | 0.003 | 3 | 51.79 | 49.36 | 0.6 |
| 92 | 3-027 | 2.72 | | 17.22 | | 0.42 | -12.19 | | 29.77 | -1.06 | 0.29 | 0.005 | 2 | 54.28 | 44.19 | 1.5 |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 93 | 3 UWC3 G1 | 2.68 | | 5.34 | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 94 | 3 UWC3 G1 | 2.68 | | 5.51 | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 95 | 3 UWC3 G1 | 2.77 | | 5.26 | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 96 | 3 UWC3 G1 | 2.91 | | 5.18 | | 0.5 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.3** | | **2SD:** | 0.29 | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 97 | 3-028 | 3.06 | | 13.29 | | 0.54 | -12.21 | | 25.82 | -4.89 | 0.23 | 0.004 | 2 | 52.72 | 47.71 | 0.0 |
| 98 | 3-029 | 2.13 | | 10.36 | | 0.3 | -5.32 | | 15.77 | -14.64 | 0.23 | 0.008 | NC |  |  |  |
| 99 | 3-030 | 2.02 | | 11.45 | | 0.28 | -5.32 | | 16.86 | -13.58 | 0.23 | 0.009 | NC |  |  |  |
| 100 | 3-031 | 2.13 | | 7.74 | | 0.2 | -5.32 | | 13.14 | -17.19 | 0.23 | 0.001 | NC |  |  |  |
| 101 | 3-032 | 3.23 | | 14.37 | | 0.53 | -12.21 | | 26.91 | -3.84 | 0.23 | 0.004 | 4 | 50.16 | 49.34 | 0.5 |
| 102 | 3-033 | 2.79 | | 17.41 | | 0.51 |  | |  |  | 0.23 | 0.004 | NF |  |  |  |
| 103 | 3-034 | 2.91 | | 12.47 | | 0.51 |  | |  |  | 0.23 | 0.004 | NF |  |  |  |
| 104 | 3-035 | 1.94 | | 15.02 | | 0.3 | -5.32 | | 20.45 | -10.10 | 0.23 | 0.001 | NC |  |  |  |
| 105 | 3-036 | 2.94 | | 12.58 | | 0.43 |  | |  |  | 0.23 | 0.004 | NF |  |  |  |
| 106 | 3-037 | 3.08 | | 15.2 | | 0.52 |  | |  |  | 0.23 | 0.005 | NF |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 107 | 3 UWC3 G1 | 2.88 | | 5.19 | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 108 | 3 UWC3 G1 | 2.87 | | 5.3 | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 109 | 3 UWC3 G1 | 2.87 | | 5.16 | | 0.43 |  | |  |  |  |  |  |  |  |  |
| 110 | 3 UWC3 G1 | 2.87 | | 5.22 | | 0.57 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.27** | | **2SD:** | **0.23** | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 111 | 3-038 | 2.72 | | 16.68 | | 0.5 |  | |  |  | 0.27 | 0.005 | NF |  |  |  |
| 112 | 3-039 | 2.93 | | 17.25 | | 0.43 |  | |  |  | 0.27 | 0.006 | NF |  |  |  |
| 113 | 3-040 | 2.93 | | 15.55 | | 0.45 |  | |  |  | 0.27 | 0.005 | NF |  |  |  |
| 114 | 3-041 | 2.79 | | 14.54 | | 0.46 |  | |  |  | 0.27 | 0.006 | NF |  |  |  |
| 115 | 3-092 | 2.09 | | 12.91 | | 0.25 | -5.31 | | 18.32 | -12.17 | 0.27 | 0.001 | NC |  |  |  |
| 116 | 3-093 | 3 | | 15.58 | | 0.48 | -12.2 | | 28.13 | -2.65 | 0.27 | 0.004 | 3 | 52.56 | 46.99 | 0.9 |
| 117 | 3-096 | 2.6 | | 17.09 | | 0.51 | -12.2 | | 29.66 | -1.17 | 0.27 | 0 | 2 | 98.55 | 1.16 | 0.2 |
| 118 | 3-097 | 2.87 | | 15.09 | | 0.55 | -12.2 | | 27.63 | -3.14 | 0.27 | 0.003 | 2 | 53.57 | 46.54 | 3.5 |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 119 | 3 UWC3 G1 | 2.72 | | 5.42 | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 120 | 3 UWC3 G1 | 2.69 | | 5.55 | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 121 | 3 UWC3 G1; Cs 131-132 | 2.78 | | 5.23 | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 122 | 3 UWC3 G1; Cs 132-133 | 2.94 | | 5.18 | | 0.41 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.28** | | **2SD:** | **0.27** | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 126 | 3-098 | 3.29 | | 16.62 | | 0.47 | -12.19 | | 29.16 | -1.65 | 0.26 | 0.002 | 1 | 53.61 | 41.58 | 4.5 |
| 127 | 3-099 | 3.23 | | 14.44 | | 0.54 | -12.19 | | 26.95 | -3.80 | 0.26 | 0.020 | 1 | 50.64 | 47.75 | 1.7 |
| 128 | 3-091 | 2.82 | | 17.36 | | 0.54 | -12.19 | | 29.91 | -0.93 | 0.26 | 0.005 | Calcite | 97.25 | 2.54 | 0.1 |
| 129 | 3-090 | 3.19 | | 15.1 | | 0.44 | -12.19 | | 27.62 | -3.15 | 0.26 | 0.002 | 6 | 51.26 | 48.1 | 1.1 |
| 130 | 3-089 | 3.04 | | 13.65 | | 0.45 | -12.19 | | 26.15 | -4.57 | 0.26 | 0.005 | 2 | 65.33 | 36.39 | 0.2 |
| 131 | 3-088 | 3.06 | | 15.73 | | 0.57 | -12.19 | | 28.26 | -2.53 | 0.26 | 0.005 | 2 | 54.21 | 43.54 | 3.0 |
| 132 | 3-087 | 2.72 | | 17.08 | | 0.61 | -12.19 | | 29.63 | -1.20 | 0.26 | 0.003 | Calcite | 98.77 | 1.32 | 0.4 |
| 133 | 3-086 | 3.19 | | 17.19 | | 0.54 | -12.19 | | 29.74 | -1.09 | 0.26 | 0.002 | 6 |  |  |  |
| 134 | 3-085 | 1.94 | | 11.54 | | 0.26 | -5.3 | | 16.93 | -13.52 | 0.26 | 0.001 | NC |  |  |  |
| 135 | 3-084 | 2.02 | | 9.39 | | 0.2 | -5.3 | | 14.77 | -15.61 | 0.26 | 0.001 | NC |  |  |  |
| 136 | 3-084a | 2.09 | | 3.61 | | 0.29 | -5.3 | | 8.95 | -21.26 | 0.26 | 0.000 | NC |  |  |  |
| 137 | 3-084b | 3.03 | | 13.8 | | 0.46 | -12.09 | | 26.2 | -4.52 | 0.26 | 0.002 | 2 | 52.39 | 47.48 | 0.5 |
| 138 | 3-083 | 2.92 | | 16.61 | | 0.45 | -12.19 | | 29.15 | -1.66 | 0.26 | 0.003 | 2 | 51.34 | 49.07 | 0.6 |
| 139 | 3-081 | 2.97 | | 15.22 | | 0.51 |  | |  |  | 0.26 | 0.004 | 3 | 49.49 | 50.29 | 0.0 |
| 140 | 3-080 | 2.98 | | 15.04 | | 0.57 | -12.19 | | 27.57 | -3.20 | 0.26 | 0.005 | 3 | 51.46 | 49.14 | 0.0 |
| 141 | 3-080a | 2.85 | | 14.38 | | 0.5 | -12.19 | | 26.89 | -3.86 | 0.26 | 0.004 | 3 | 54.12 | 45.84 | 0.1 |
| 142 | 3-080b | 3.03 | | 18.67 | | 0.39 | -12.19 | | 31.23 | 0.35 | 0.26 | 0.004 | 2 | 53.89 | 44.37 | 2.8 |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| 143 | 3 UWC3 G1 | 2.76 | | 5.18 | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 144 | 3 UWC3 G1 | 2.73 | | 5.3 | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 145 | 3 UWC3 G1 | 2.72 | | 5.27 | | 0.38 |  | |  |  |  |  |  |  |  |  |
| 146 | 3 UWC3 G1 | 2.71 | | 5.25 | | 0.56 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | **5.3** | | **2SD:** | **0.26** | |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 4. 13 µm beam, 1.2 nA intensity. October 7th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 147 | 4 UWC3 G1 | 2.84 | | | 5.03 | 0.5 |  | |  |  |  |  |  |  |  |  |
| 148 | 4 UWC3 G2 | 2.87 | | | 5.37 | 0.55 |  | |  |  |  |  |  |  |  |  |
| 149 | 4 UWC3 G2 | 2.86 | | | 5.34 | 0.52 |  | |  |  |  |  |  |  |  |  |
| 150 | 4 UWC3 G2 | 2.87 | | | 5.19 | 0.51 |  | |  |  |  |  |  |  |  |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 151 | 4-004 | 2.87 | | | 16.29 | 0.54 | -12.3 | | 28.94 | -1.87 | 0.26 | 0.002 | Calcite | 99.41 | 0.59 | 0.0 |
| 152 | 4-005 | 2.97 | | | 14.11 | 0.56 | -12.3 | | 26.74 | -4.00 | 0.26 | 0.006 | 3 | 29.56 | 70.59 | 0.1 |
| 153 | 4-006 | 2.72 | | | 19.1 | 0.56 | -12.3 | | 31.79 | 0.90 | 0.26 | 0.003 | 2 | 96.84 | 3.53 | 0.0 |
| 154 | 4-007 | 3.12 | | | 14.52 | 0.33 | -11.64 | | 26.47 | -4.26 | 0.26 | 0.001 | 4 | 43.54 | 56.22 | 0.3 |
| 155 | 4-008 | 2.11 | | | 5.18 | 0.21 | -5.41 | | 10.65 | -19.61 | 0.26 | 0.000 | NC |  |  |  |
| 156 | 4-009 | 2.94 | | | 13.49 | 0.58 | -12.3 | | 26.11 | -4.61 | 0.26 | 0.002 | 4 | 42.06 | 57.74 | 0.0 |
| 157 | 4-010 | 3.03 | | | 14.61 | 0.63 | -12.3 | | 27.25 | -3.51 | 0.26 | 0.003 | 4 | 40.07 | 59.27 | 0.6 |
| 158 | 4-011 | 2.54 | | | 19.26 | 0.42 |  | |  |  |  | 0.004 | Er | 95.32 | 3.47 |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 159 | 4 UWC3 G2 | 2.83 | | | 5.1 | 0.56 |  | |  |  |  |  |  |  |  |  |
| 160 | 4 UWC3 G2 | 2.85 | | | 5.12 | 0.48 |  | |  |  |  |  |  |  |  |  |
| 161 | 4 UWC3 G2 | 2.86 | | | 5.27 | 0.52 |  | |  |  |  |  |  |  |  |  |
| 162 | 4 UWC3 G2 | 2.89 | | | 5.04 | 0.53 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | | **5.19** | **2SD:** | **0.19** | |  |  |  |  |  |  |  |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 163 | 4-012 | 3.11 | | | 12.67 | 0.44 | -11.75 | | 24.71 | -5.97 | 0.22 | 0.008 | 3 | 40.07 | 59.27 | 0.6 |
| 164 | 4-013 | 2.9 | | | 16.72 | 0.45 | -12.41 | | 29.5 | -1.32 | 0.22 | 0.002 | Calcite | 96.74 | 0.9 | 1.1 |
| 165 | 4-014 | 2.81 | | | 17.56 | 0.53 | -12.41 | | 30.35 | -0.50 | 0.22 | 0.003 | Calcite | 97.44 | 1.78 | 0.3 |
| 166 | 4-015 | 3.12 | | | 15 | 0.44 | -12.41 | | 27.76 | -3.01 | 0.22 | 0.003 | 2 | 42.26 | 57.67 | 0.2 |
| 167 | 4-016 | 3.32 | | | 16.57 | 0.57 | -12.41 | | 29.34 | -1.48 | 0.22 | 0.003 | 3 | 42.62 | 57.56 | 0.3 |
| 168 | 4-017 | 2.84 | | | 17.77 | 0.71 | -12.41 | | 30.56 | -0.29 | 0.22 | 0.010 | Calcite | 96.72 | 3.11 | 0.6 |
| 169 | 4-018 | 2.94 | | | 17.81 | 0.54 | -12.41 | | 30.6 | -0.26 | 0.22 | 0.003 | Calcite | 94.79 | 2.96 | 1.0 |
| 170 | 4-018a | 3 | | | 18.74 | 0.59 | -12.41 | | 31.54 | 0.66 | 0.22 | 0.003 | Calcite | 95.49 | 4.4 | 0.0 |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 171 | 4 UWC3 G2 | 3.19 | | | 4.98 | 0.59 |  | |  |  |  |  |  |  |  |  |
| 172 | 4 UWC3 G2 | 3.2 | | | 5.14 | 0.45 |  | |  |  |  |  |  |  |  |  |
| 173 | 4 UWC3 G2 | 3.15 | | | 4.97 | 0.49 |  | |  |  |  |  |  |  |  |  |
| 174 | 4 UWC3 G2 | 3.12 | | | 4.95 | 0.48 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | | **5.07** | **2SD:** | **0.22** | |  |  |  |  |  |  |  |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 175 | 4-019 | 3.04 | | | 19.71 | 0.52 | -12.46 | | 32.58 | 1.66 | 0.15 | 0.002 | Calcite | 96.63 | 3.63 | 0.1 |
| 176 | 4-020 | 2.98 | | | 19.16 | 0.53 | -12.46 | | 32.03 | 1.13 | 0.15 | 0.002 | Calcite | 98.56 | 3.27 | 0.0 |
| 177 | 4-021 | 2.95 | | | 19.71 | 0.51 | -12.46 | | 32.58 | 1.66 | 0.15 | 0.002 | Calcite | 98.64 | 3.09 | 0.0 |
| 178 | 4-022 | 2.8 | | | 18.2 | 0.57 | -12.46 | | 31.05 | 0.18 | 0.15 | 0.003 | Calcite | 97.4 | 3.76 | 0.4 |
| 179 | 4-023 | 3.09 | | | 18 | 0.46 | -12.46 | | 30.85 | -0.01 | 0.15 | 0.002 | Calcite | 97.83 | 2.69 | 0.0 |
| 180 | 4-024 | 3.05 | | | 20 | 0.48 | -11.81 | | 32.18 | 1.28 | 0.15 | 0.001 | 3 | 53.01 | 46.48 | 0.6 |
| 181 | 4-025 | 3.08 | | | 18.29 | 0.58 | -12.46 | | 31.14 | 0.27 | 0.15 | 0.004 | Calcite | 95.31 | 4.3 | 0.0 |
| 182 | 4-026 | 3.14 | | | 17.71 | 0.46 | -12.46 | | 30.56 | -0.29 | 0.15 | 0.002 | Calcite | 95.67 | 4.53 | 0.0 |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 183 | 4 UWC3 G2 | 3.26 | | | 5.05 | 0.51 |  | |  |  |  |  |  |  |  |  |
| 184 | 4 UWC3 G2 | 3.28 | | | 4.91 | 0.47 |  | |  |  |  |  |  |  |  |  |
| 185 | 4 UWC3 G2 | 3.16 | | | 5.04 | 0.51 |  | |  |  |  |  |  |  |  |  |
| 186 | 4 UWC3 G2 | 3.14 | | | 5.08 | 0.44 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | | **5.01** | **2SD:** | **0.15** | |  |  |  |  |  |  |  |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 187 | 4-027 | 2.96 | | | 19.61 | 0.51 | -12.45 | | 32.46 | 1.55 | 0.18 | 0.000 | Calcite | 96.81 | 3.25 | 0.0 |
| 188 | 4-066 | 2.92 | | | 18.52 | 0.48 | -5.8 | | 24.46 | -6.21 | 0.18 | 0.002 | 2 |  |  |  |
| 189 | 4-074 | 2.95 | | | 17.43 | 0.45 | -12.45 | | 30.25 | -0.60 | 0.18 | 0.004 | Calcite | 92.15 | 7.51 | 0.0 |
| 190 | 4-074a | 3.44 | | | 15.41 | 0.35 | -12.45 | | 28.21 | -2.57 | 0.18 | 0.001 | 3 | 29.05 | 72.06 | 0.0 |
| 191 | 4-074b | 3.07 | | | 19.77 | 0.46 | -12.45 | | 32.62 | 1.70 | 0.18 | 0.003 | Calcite | 94.64 | 5.6 | 0.0 |
| 192 | 4-028 | 3.13 | | | 19.41 | 0.49 | -12.45 | | 32.26 | 1.35 | 0.18 | 0.001 | Calcite | 98.12 | 1.63 | 0.1 |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 197 | 4 UWC3 G2 | 3.24 | | | 4.93 | 0.54 |  | |  |  |  |  |  |  |  |  |
| 198 | 4 UWC3 G2 | 3.25 | | | 5.01 | 0.54 |  | |  |  |  |  |  |  |  |  |
| 199 | 4 UWC3 G2 | 3.14 | | | 5.08 | 0.51 |  | |  |  |  |  |  |  |  |  |
| 200 | 4 UWC3 G2 | 3.01 | | | 5.19 | 0.5 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | | **5.03** | **2SD:** | **0.18** | |  |  |  |  |  |  |  |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 201 | 4-029 | 2.89 | | | 17.35 | 0.56 | -12.33 | | 30.05 | -0.79 | 0.3 | 0.000 | Calcite | 97.09 | 2.66 | 0.2 |
| 202 | 4-030 | 2.81 | | | 20.11 | 0.44 | -12.33 | | 32.85 | 1.93 | 0.3 | 0.002 | Calcite | 95.89 | 4.69 | 0.0 |
| 203 | 4-031 | 3.03 | | | 15.37 | 0.42 | -12.33 | | 28.05 | -2.73 | 0.3 | 0.004 | 2 | 43.23 | 57.03 | 0.0 |
| 204 | 4-032 | 2.7 | | | 19.1 | 0.54 | -12.33 | | 31.83 | 0.94 | 0.3 | 0.004 | Calcite | 96.96 | 4.33 | 0.0 |
| 205 | 4-033 | 2.82 | | | 18.53 | 0.47 | -12.33 | | 31.25 | 0.37 | 0.3 | 0.003 | Calcite | 98.43 | 2.05 | 0.3 |
| 206 | 4-034 | 3.08 | | | 15.39 | 0.46 | -12.33 | | 28.07 | -2.71 | 0.3 | 0.003 | 3 | 43.63 | 56.02 | 0.0 |
| 207 | 4-035 | 2.91 | | | 19.78 | 0.49 | -12.33 | | 32.51 | 1.60 | 0.3 | 0.001 | Calcite | 98.43 | 2.62 | 0.0 |
| 208 | 4-035a | 2.73 | | | 18.89 | 0.53 | -12.33 | | 31.61 | 0.72 | 0.3 | 0.004 | Calcite | 99.73 | 2.26 | 0.0 |
| 209 | 4-036 | 2.86 | | | 18.11 | 0.51 | -12.33 | | 30.82 | -0.04 | 0.3 | 0.001 | Calcite | 99.77 | 0 | 0.0 |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| 210 | 4 UWC3 G2 | 3.02 | | | 5.33 | 0.55 |  | |  |  |  |  |  |  |  |  |
| 211 | 4 UWC3 G2 | 3.05 | | | 5.18 | 0.45 |  | |  |  |  |  |  |  |  |  |
| 212 | 4 UWC3 G2 | 3.04 | | | 5.35 | 0.52 |  | |  |  |  |  |  |  |  |  |
| 213 | 4 UWC3 G2 | 3.06 | | | 5.11 | 0.47 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | | | **5.15** | **2SD:** | **0.3** | |  |  |  |  |  |  |  |  |
|  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 4. 13 µm beam, 1.2 nA intensity. October 7th 2015\*** | | | | | | | | |  |  |  |  |  |  |  |  |
| 214 | 4 UWC3 G2 | 3.09 | 5.3 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
| 215 | 4 UWC3 G2 | 2.99 | 5.17 | | | 0.55 |  | |  |  |  |  |  |  |  |  |
| 216 | 4 UWC3 G2 | 2.95 | 5.16 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 217 | 4 UWC3 G2 | 2.97 | 5.24 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 218 | 4-038 | 2.16 | 4.78 | | | 0.23 | -5.34 | | 10.18 | -20.06 | 0.21 | 0.001 | NC |  |  |  |
| 219 | 4-039 | 2.89 | 19.25 | | | 0.53 | -6.37 | | 25.78 | -4.93 | 0.21 | 0.001 | 6 | 95.97 | 3.56 | 0.0 |
| 220 | 4-048 | 2.89 | 17.3 | | | 0.46 | -12.23 | | 29.9 | -0.94 | 0.21 | 0.002 | Calcite | 99.15 | 0.89 | 0.5 |
| 221 | 4-051 | 2.74 | 18.27 | | | 0.48 | -12.23 | | 30.88 | 0.02 | 0.21 | 0.005 | Calcite | 98.53 | 1.41 | 0.5 |
| 222 | 4-056 | 2.38 | 21.05 | | | 0.54 | -12.23 | | 33.7 | 2.75 | 0.21 | 0.000 | Calcite | 95.62 | 3.99 | 0.2 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 223 | 4 UWC3 G2 | 2.69 | 5.49 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 224 | 4 UWC3 G2 | 2.91 | 5.25 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 225 | 4 UWC3 G2 | 3 | 5.19 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 226 | 4 UWC3 G2 | 3.06 | 5.22 | | | 0.45 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.25** | | | **2SD:** | **0.21** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 227 | 4-057 | 2.98 | 19.57 | | | 0.53 | -12.32 | | 32.29 | 1.38 | 0.38 | 0.000 | Calcite | 96.53 | 3.34 | 0.0 |
| 228 | 4-058 | 3.23 | 12.41 | | | 0.41 | -12.32 | | 25.04 | -5.65 | 0.38 | 0.008 | 2 | 41.6 | 59.03 | 0.0 |
| 229 | 4-059 | 2.98 | 19.76 | | | 0.58 | -12.32 | | 32.48 | 1.57 | 0.38 | 0.000 | Calcite | 96.4 | 2.72 | 0.4 |
| 230 | 4-061 | 3.22 | 12.15 | | | 0.43 | -11.66 | | 24.1 | -6.56 | 0.38 | 0.002 | 2 | 38.76 | 60.38 | 0.6 |
| 231 | 4-069 | 2.27 | 12.13 | | | 0.23 | -5.43 | | 17.66 | -12.81 | 0.38 | 0.000 | NC |  |  |  |
| 232 | 4-069a | 3.23 | 12.25 | | | 0.46 | -12.32 | | 24.88 | -5.80 | 0.38 | 0.001 | 2 | 38.39 | 62.63 | 0.4 |
| 233 | 4-070 | 3.02 | 19.52 | | | 0.52 | -10.92 | | 30.77 | -0.09 | 0.38 | 0.001 | 3 | 97.11 | 3.82 | 0.1 |
| 234 | 4-072 | 3.02 | 18.12 | | | 0.55 | -12.32 | | 30.82 | -0.04 | 0.38 | 0.000 | Calcite | 95.66 | 2.9 | 1.3 |
| 235 | 4-078 | 3.28 | 14.99 | | | 0.5 | -12.32 | | 27.65 | -3.12 | 0.38 | 0.003 | 3 | 40.19 | 60.06 | 0.0 |
| 236 | 4-086 | 2.29 | 13.86 | | | 0.28 | -5.43 | | 19.4 | -11.12 | 0.38 | 0.003 | NC |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 237 | 4 UWC3 G2 | 3.09 | 5 | | | 0.4 |  | |  |  |  |  |  |  |  |  |
| 238 | 4 UWC3 G2 | 3.07 | 5.21 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 239 | 4 UWC3 G2 | 3.11 | 5.08 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 240 | 4 UWC3 G2 | 3.14 | 4.86 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.16** | | | **2SD:** | **0.38** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 251 | 4-092 | 3.11 | 18.29 | | | 0.47 | -12.33 | | 31 | 0.13 | 0.32 | 0.002 | Calcite | 97.07 | 3.63 | 0.0 |
| 252 | 4-097 | 3.17 | 17.24 | | | 0.53 | -12.33 | | 29.94 | -0.90 | 0.32 | 0.002 | Calcite | 98.76 | 1.45 | 0.2 |
| 253 | 4-097a | 3.11 | 19.27 | | | 0.52 | -12.33 | | 31.99 | 1.09 | 0.32 | 0.002 | Calcite | 97.3 | 3.08 | 0.2 |
| 254 | 4-089 | 3.53 | 13.63 | | | 0.49 | -11.67 | | 25.6 | -5.11 | 0.32 | 0.016 | 2 | 40.25 | 58.72 | 0.4 |
| 255 | 4-042; Cs 141-139 | 3.27 | 12.17 | | | 0.59 | -12.33 | | 24.81 | -5.87 | 0.32 | 0.003 | 2 | 41.28 | 58.44 | 0.3 |
| 256 | 4-043 | 2.93 | 17.82 | | | 0.59 | -12.33 | | 30.53 | -0.32 | 0.32 | 0.003 |  | 94.62 | 4.76 | 0.0 |
| 257 | 4-100 | 2.19 | 14.22 | | | 0.34 | -5.44 | | 19.77 | -10.76 | 0.32 | 0.009 | NC |  |  |  |
| 258 | 4-082 | 3.31 | 12.92 | | | 0.58 | -11.67 | | 24.88 | -5.80 | 0.32 | 0.001 | 2 | 39.81 | 60.54 | 0.3 |
| 259 | 4-082a | 3.26 | 13.87 | | | 0.57 | -12.33 | | 26.52 | -4.21 | 0.32 | 0.002 | 2 | 39.03 | 60.9 | 0.0 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 260 | 4 UWC3 G2 | 3.09 | 5.35 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 261 | 4 UWC3 G2 | 3.09 | 5.28 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 262 | 4 UWC3 G2 | 3.1 | 5.21 | | | 0.55 |  | |  |  |  |  |  |  |  |  |
| 263 | 4 UWC3 G2 | 3.12 | 5.23 | | | 0.57 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.15** | | | **2SD:** | **0.32** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 5. 13 µm beam, 1.2 nA intensity. October 8th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 264 | 5 UWC3 G1 | 2.86 | 4.86 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 265 | 5 UWC3 G2 | 2.89 | 4.96 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 266 | 5 UWC3 G2 | 2.98 | 4.62 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 267 | 5 UWC3 G2 | 2.99 | 4.82 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 268 | 5-015 | 3.04 | 16.74 | | | 0.21 | -12.57 | | 29.69 | -1.14 | 0.39 | 0.004 | 6 | 52.16 | 46.54 | 1.2 |
| 269 | 5-015a | 3.2 | 15 | | | 0.45 | -12.57 | | 27.92 | -2.86 | 0.39 | 0.004 | 6 | 50.99 | 48.25 | 1.0 |
| 270 | 5-015b | 3.12 | 15.54 | | | 0.37 | -12.57 | | 28.46 | -2.33 | 0.39 | 0.004 | 6 | 50.41 | 48.45 | 1.0 |
| 271 | 5-015c | 3.18 | 15.26 | | | 0.46 | -12.57 | | 28.19 | -2.59 | 0.39 | 0.005 | 6 | 51.26 | 47.73 | 1.1 |
| 272 | 5-089 | 2.12 | 9.08 | | | 0.32 | -5.68 | | 14.84 | -15.54 | 0.39 | 0.002 | NC |  |  |  |
| 273 | 5-015d | 3.16 | 13.94 | | | 0.62 | -12.57 | | 26.84 | -3.90 | 0.39 | 0.005 | 6 | 44.91 | 58.97 | 1.7 |
| 274 | 5-100 | 3.05 | 13.6 | | | 0.51 | -12.57 | | 26.51 | -4.22 | 0.39 | 0.009 | 3 | 52.34 | 47.53 | 0.0 |
| 275 | 5-100a | 2.95 | 14.52 | | | 0.41 | -12.57 | | 27.43 | -3.33 | 0.39 | 0.007 | 1 | 50.27 | 48.1 | 1.3 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 276 | 5 UWC3 G1 | 2.8 | 5.27 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 277 | 5 UWC3 G1 | 2.82 | 5.04 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 278 | 5 UWC3 G1 | 2.98 | 4.92 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 279 | 5 UWC3 G1 | 3.04 | 4.78 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.91** | | | **2SD:** | **0.39** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 280 | 5-099 | 3.19 | 11.31 | | | 0.53 | -12.47 | | 24.08 | -6.58 | 0.39 | 0.002 | 2 | 51.59 | 48.66 | 0.0 |
| 281 | 5-098 | 3.12 | 14.4 | | | 0.5 | -12.47 | | 27.21 | -3.54 | 0.39 | 0.005 | 4 | 54.05 | 46.27 | 0.0 |
| 282 | 5-028 | 2.18 | 22.62 | | | 0.25 | -5.58 | | 28.36 | -2.43 | 0.39 | 0.002 | NC |  |  |  |
| 283 | 5-028a | 2.2 | 22.45 | | | 0.27 | -5.58 | | 28.19 | -2.59 | 0.39 | 0.002 | NC |  |  |  |
| 284 | 5-028b | 2.2 | 22.1 | | | 0.31 | -5.58 | | 27.84 | -2.93 | 0.39 | 0.002 | NC |  |  |  |
| 285 | 5-023 | 3.12 | 14.29 | | | 0.35 | -12.47 | | 27.09 | -3.66 | 0.39 | 0.007 | 2 | 51.27 | 49.06 | 0.0 |
| 286 | 5-004 | 3.31 | 13.24 | | | 0.57 | -12.47 | | 26.03 | -4.69 | 0.39 | 0.009 | 5 | 50.91 | 47.78 | 1.8 |
| 287 | 5-005 | 2.18 | 8.78 | | | 0.3 | -5.58 | | 14.44 | -15.93 | 0.39 | 0.001 | NC |  |  |  |
| 288 | 5-078 | 2.9 | 12.4 | | | 0.56 | -12.47 | | 25.18 | -5.51 | 0.39 | 0.004 | 2 | 51.05 | 48.85 | 0.2 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 289 | 5 UWC3 G1 | 2.59 | 4.94 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 290 | 5 UWC3 G1 | 2.67 | 5.01 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
| 291 | ~~5 UWC3 G1~~ | ~~2.89~~ | ~~1~~ | | | ~~10.72~~ |  | |  |  |  |  |  |  |  |  |
| 292 | 5 UWC3 G1 | 2.82 | 5.32 | | | 0.44 |  | |  |  |  |  |  |  |  |  |
| 293 | 5 UWC3 G1 | 2.87 | 4.81 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.01** | | | **2SD:** | **0.39** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 294 | 5-080 | 2.93 | 15.67 | | | 0.47 | -12.43 | | 28.45 | -2.34 | 0.37 | 0.005 | 2 | 50.92 | 48.96 | 0.3 |
| 295 | 5-081 | 3 | 12.69 | | | 0.46 | -12.43 | | 25.43 | -5.27 | 0.37 | 0.002 | 4 | 51.83 | 47.53 | 0.5 |
| 296 | 5-082 | 2.1 | 11.3 | | | 0.25 | -5.54 | | 16.93 | -13.52 | 0.37 | 0.001 | NC |  |  |  |
| 297 | 5-084 | 2.97 | 17.5 | | | 0.54 |  | |  |  | 0.37 | 0.009 | Er |  |  |  |
| 298 | 5-053 | 1.86 | 10.58 | | | 0.27 | -5.54 | | 16.21 | -14.22 | 0.37 | 0.002 | NC |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 299 | 5 UWC3 G1 | 2.67 | 5.01 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
| 300 | 5 UWC3 G1 | 2.75 | 5.07 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 301 | 5 UWC3 G1 | 2.82 | 5.34 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 302 | 5 UWC3 G1 | 2.87 | 4.94 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.05** | | | **2SD:** | **0.37** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 1. 13 µm beam, 1.2 nA intensity. October 8th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 303 | 1 UWC3 G1 | 2.87 | 5.12 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 304 | 1 UWC3 G1 | 2.9 | 5.01 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
| 305 | 1 UWC3 G1 | 2.93 | 5.24 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 306 | 1 UWC3 G1 | 2.93 | 4.87 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 307 | 1-079 | 3 | 14.05 | | | 0.33 | -12.56 | | 26.95 | -3.80 | 0.39 | 0.006 | 3 | 49.35 | 48.35 | 1.6 |
| 308 | 1-073 | 3.11 | 11.75 | | | 0.52 | -11.16 | | 23.17 | -7.46 | 0.39 | 0.002 | 4 | 47.48 | 51.42 | 0.0 |
| 309 | 1-072 | 3.07 | 14.41 | | | 0.51 | -12.56 | | 27.32 | -3.44 | 0.39 | 0.002 | 2 | 49.43 | 50.23 | 0.7 |
| 310 | 1-071 | 3.14 | 12.58 | | | 0.47 | -12.56 | | 25.46 | -5.24 | 0.39 | 0.005 | 3 | 49.92 | 50.55 | 0.0 |
| 311 | 1-071a | 3.1 | 16.18 | | | 0.48 | -11.9 | | 28.42 | -2.37 | 0.39 | 0.005 | 2 | 46.15 | 53.38 | 0.3 |
| 312 | 1-071b | 3.17 | 15.02 | | | 0.34 | -12.56 | | 27.93 | -2.85 | 0.39 | 0.004 | 2 | 48.36 | 51.38 | 0.7 |
| 313 | 1-074 | 3.24 | 13.91 | | | 0.51 | -12.56 | | 26.81 | -3.93 | 0.39 | 0.007 | 4 | 48.99 | 50.59 | 0.8 |
| 314 | 1-075 | 3.31 | 13.71 | | | 0.51 | -11.9 | | 25.93 | -4.79 | 0.39 | 0.004 | 4 | 45.64 | 54.67 | 0.0 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 315 | 1 UWC3 G1 | 3.17 | 4.91 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 316 | 1 UWC3 G1 | 3.11 | 4.74 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 317 | 1 UWC3 G1 | 2.98 | 4.74 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
| 318 | 1 UWC3 G1 | 2.98 | 4.69 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.92** | | | **2SD:** | **0.39** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 319 | 1-051 | 3.06 | 13.79 | | | 0.55 | -11.96 | | 26.06 | -4.66 | 0.28 | 0.004 | 2 | 47.21 | 52.91 | 0.5 |
| 320 | 1-051a | 3.08 | 13.7 | | | 0.48 | -10.5 | | 24.46 | -6.21 | 0.28 | 0.006 | 2 | 46.63 | 53.15 | 1.9 |
| 321 | 1-051b | 3.1 | 13.03 | | | 0.47 | -12.61 | | 25.98 | -4.74 | 0.28 | 0.007 | 2 | 47.02 | 53.07 | 0.0 |
| 322 | 1-052 | 3.13 | 13.37 | | | 0.55 |  | |  |  | 0.28 | 0.008 | Er |  |  |  |
| 323 | 1-053 | 3.15 | 11.64 | | | 0.47 | -12.61 | | 24.56 | -6.12 | 0.28 | 0.006 | 2 | 47.41 | 52.78 | 0.2 |
| 324 | 1-054 | 3.28 | 13.09 | | | 0.41 | -12.61 | | 26.03 | -4.69 | 0.28 | 0.002 | 2 |  |  |  |
| 325 | 1-054a | 3.23 | 13.23 | | | 0.5 | -12.61 | | 26.18 | -4.54 | 0.28 | 0.008 | 2 | 49.23 | 50.94 | 0.6 |
| 326 | 1-054b | 3.2 | 12.84 | | | 0.44 | -12.61 | | 25.78 | -4.93 | 0.28 | 0.004 | 2 | 41.88 | 58.18 | 0.3 |
| 327 | 1-054c | 3.16 | 12.66 | | | 0.46 | -12.61 | | 25.6 | -5.11 | 0.28 | 0.001 | 2 | 72.54 | 26.83 | 1.4 |
| 328 | 1-054d | 3.11 | 13.95 | | | 0.46 | -12.61 | | 26.91 | -3.84 | 0.28 | 0.001 | 2 | 63.55 | 36 | 0.7 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 329 | 1 UWC3 G1 | 2.97 | 4.96 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 330 | 1 UWC3 G1 | 3.03 | 4.8 | | | 0.56 |  | |  |  |  |  |  |  |  |  |
| 331 | 1 UWC3 G1 | 3.09 | 5 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 332 | 1 UWC3 G1 | 3.14 | 5.07 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.86** | | | **2SD:** | **0.28** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 333 | 1-067 | 3.33 | 13.28 | | | 0.59 | -12.52 | | 26.13 | -4.59 | 0.28 | 0.004 | 2 | 47.59 | 52.22 | 0.9 |
| 334 | 1-067a | 2.87 | 16.88 | | | 12.49 | -12.52 | | 29.78 | -1.05 | 0.28 | 0.006 | 2 | 49.33 | 50.53 | 0.2 |
| 335 | 1-067b | 3.09 | 13.57 | | | 0.66 | -12.52 | | 26.42 | -4.31 | 0.28 | 0.001 | 2 | 47.32 | 52.88 | 0.4 |
| 336 | 1-067c | 3.09 | 11.43 | | | 0.51 | -12.52 | | 24.25 | -6.42 | 0.28 | 0.008 | 2 | 48.78 | 52.04 | 0.0 |
| 337 | 1-067d | 3.07 | 14.91 | | | 0.45 | -11.86 | | 27.1 | -3.65 | 0.28 | 0.004 | 2 | 47.31 | 53.36 | 0.7 |
| 338 | 1-067e | 3.09 | 13.76 | | | 0.45 | -12.52 | | 26.61 | -4.13 | 0.28 | 0.007 | 2 | 48.51 | 52.41 | 1.9 |
| 339 | 1-067f | 3.07 | 12.72 | | | 0.49 | -12.52 | | 25.56 | -5.15 | 0.28 | 0.007 | 2 | 49.24 | 50.82 | 0.3 |
| 340 | 1-067g | 3.12 | 12.27 | | | 0.5 | -12.52 | | 25.11 | -5.58 | 0.28 | 0.002 | 2 |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 341 | 1 UWC3 G1 | 2.85 | 4.99 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 342 | 1 UWC3 G1 | 2.83 | 5.18 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 343 | 1 UWC3 G1 | 2.83 | 4.76 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 344 | 1 UWC3 G1 | 2.8 | 4.9 | | | 0.56 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.96** | | | **2SD:** | **0.28** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 7. 13 µm beam, 1.2 nA intensity. October 8th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 345 | 7 UWC3 G1 | 2.86 | 5.08 | | | 0.55 |  | |  |  |  |  |  |  |  |  |
| 346 | 7 UWC3 G1 | 2.88 | 5.12 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 347 | 7 UWC3 G1 | 2.85 | 5.06 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 348 | 7 UWC3 G1 | 2.8 | 5.09 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 349 | 7 UWC3 G1 | 2.87 | 5.24 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 350 | 7-004 | 3.25 | 12.67 | | | 0.45 | -11.79 | | 24.75 | -5.93 | 0.25 | 0.009 | 1 | 50.03 | 49.95 | 0.3 |
| 351 | 7-005 | 3.21 | 11.58 | | | 0.46 | -11.79 | | 23.65 | -7.00 | 0.25 | 0.010 | 4 | 51.22 | 48.5 | 0.6 |
| 352 | 7-006 | 2.25 | 7.01 | | | 0.3 | -5.56 | | 12.63 | -17.69 | 0.25 | 0.001 | NC |  |  |  |
| 353 | 7-020 | 2.36 | 10.81 | | | 0.23 | -5.56 | | 16.46 | -13.97 | 0.25 | 0.001 | NC |  |  |  |
| 354 | 7-021 | 2.11 | 7.22 | | | 0.3 | -5.56 | | 12.85 | -17.47 | 0.25 | 0.002 | NC |  |  |  |
| 355 | 7-023 | 2.33 | 8.82 | | | 0.27 | -5.56 | | 14.45 | -15.92 | 0.25 | 0.001 | NC |  |  |  |
| 356 | 7-024 | 2.33 | 12.7 | | | 0.32 | -5.56 | | 18.35 | -12.14 | 0.25 | 0.002 | NC |  |  |  |
| 357 | 7-060 | 2.36 | 12.84 | | | 0.28 | -5.56 | | 18.5 | -11.99 | 0.25 | 0.001 | NC |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 358 | 7 UWC3 G1 | 3.23 | 4.79 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 359 | 7 UWC3 G1 | 3.15 | 4.94 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 360 | 7 UWC3 G1 | 3.03 | 4.97 | | | 0.39 |  | |  |  |  |  |  |  |  |  |
| 361 | 7 UWC3 G1 | 2.91 | 5.02 | | | 0.4 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.04** | | | **2SD:** | **0.25** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 362 | 7-048 | 3.15 | 14.95 | | | 0.55 | -12.43 | | 27.72 | -3.05 | 0.33 | 0.007 | 3 | 52.67 | 45.85 | 0.0 |
| 363 | 7-047 | 3.1 | 13.24 | | | 0.48 | -12.43 | | 25.99 | -4.73 | 0.33 | 0.007 | 4 | 51.45 | 48.36 | 0.2 |
| 364 | 7-041 | 2.99 | 13.77 | | | 0.44 | -12.43 | | 26.53 | -4.20 | 0.33 | 0.007 | 3 | 51.87 | 48.16 | 0.1 |
| 365 | 7-041a | 1.96 | 5.55 | | | 0.26 | -5.54 | | 11.15 | -19.12 | 0.33 | 0.002 | NC |  |  |  |
| 366 | 7-040 | 2.09 | 13.5 | | | 0.37 | -5.54 | | 19.15 | -11.36 | 0.33 | 0.002 | NC |  |  |  |
| 367 | 7-100 | 2.94 | 13.59 | | | 0.44 | -12.43 | | 26.34 | -4.39 | 0.33 | 0.008 | 2 | 51.3 | 49.63 | 0.0 |
| 368 | 7-099 | 3.03 | 11.6 | | | 0.57 | -12.43 | | 24.33 | -6.34 | 0.33 | 0.010 | 3 | 52.11 | 48.4 | 0.0 |
| 369 | 7-098 | 2.13 | 7.3 | | | 0.25 | -5.54 | | 12.91 | -17.42 | 0.33 | 0.003 | NC |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 370 | 7 UWC3 G1 | 2.86 | 5.18 | | | 0.45 |  | |  |  |  |  |  |  |  |  |
| 371 | 7 UWC3 G1 | 2.85 | 5.05 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 372 | 7 UWC3 G1 | 2.87 | 5.34 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 373 | 7 UWC3 G1 | 2.91 | 5.11 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.05** | | | **2SD:** | 0.33 | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 374 | 7-051 | 3.08 | 12.17 | | | 0.52 | -12.21 | | 24.68 | -6.00 | 0.3 | 0.006 | 2 | 51.48 | 47.95 | 0.0 |
| 375 | 7-052 | 3.12 | 12.95 | | | 0.49 | -11.56 | | 24.79 | -5.89 | 0.3 | 0.008 | 3 | 52.16 | 47.27 | 0.3 |
| 376 | 7-053 | 1.99 | 9.81 | | | 0.27 | -5.32 | | 15.21 | -15.19 | 0.3 | 0.001 | NC |  |  |  |
| 377 | 7-054 | 2.79 | 14.44 | | | 0.5 | -7.84 | | 22.46 | -8.15 | 0.3 | 0.008 | 2 | 55.27 | 42.11 | 3.1 |
| 378 | 7-054a | 1.85 | 15.6 | | | 0.43 | -10.81 | | 26.7 | -4.04 | 0.3 | 0.009 | 3 | 51.3 | 48.99 | 0.8 |
| 379 | 7-054b | 2.74 | 13.13 | | | 0.39 | -12.21 | | 25.65 | -5.06 | 0.3 | 0.013 | 3 | 50.63 | 49.74 | 0.0 |
| 380 | 7-055 | 2.85 | 12.52 | | | 0.48 | -12.21 | | 25.03 | -5.66 | 0.3 | 0.007 | 4 | 50.19 | 50.04 | 0.0 |
| 381 | 7-070 | 2.76 | 15.81 | | | 0.55 | -12.21 | | 28.37 | -2.42 | 0.3 | 0.008 | 2 | 50.96 | 50.03 | 0.6 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 382 | 7 UWC3 G1 | 2.62 | 5.43 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 383 | 7 UWC3 G1 | 2.62 | 5.4 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 384 | 7 UWC3 G1 | 2.71 | 5.43 | | | 0.56 |  | |  |  |  |  |  |  |  |  |
| 385 | 7 UWC3 G1 | 2.8 | 5.23 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.27** | | | **2SD:** | **0.3** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 386 | 7-073 | 3.14 | 13.47 | | | 0.35 | -12.25 | | 26.04 | -4.68 | 0.38 | 0.007 | 2 | 47.49 | 49.76 | 0.9 |
| 387 | 7-074 | 3.09 | 14.61 | | | 0.53 | -12.25 | | 27.18 | -3.57 | 0.38 | 0.007 | 2 | 50.75 | 48.8 | 0.1 |
| 388 | 7-075 | 3.09 | 14.56 | | | 0.45 | -1.82 | | 16.41 | -14.02 | 0.38 | 0.008 | 3 | 48.46 | 53.53 | 0.0 |
| 389 | 7-079 | 2.8 | 15.72 | | | 0.44 | -2.2 | | 17.96 | -12.52 | 0.38 | 0.005 | Calcite | 95.53 | 3.75 | 0.2 |
| 390 | 7-080 | 3.07 | 13.25 | | | 0.45 | -12.25 | | 25.82 | -4.89 | 0.38 | 0.008 | 3 | 52.44 | 47.75 | 0.3 |
| 391 | 7-081 | 3.01 | 13.53 | | | 0.51 | -10.84 | | 24.64 | -6.04 | 0.38 | 0.010 | 2 | 50.13 | 49.45 | 0.2 |
| 392 | 7-081a | 3.08 | 14.5 | | | 0.49 | -12.25 | | 27.08 | -3.67 | 0.38 | 0.007 | 2 | 53.33 | 47.05 | 0.0 |
| 393 | 7-081b | 2.15 | 8.3 | | | 0.32 | -5.36 | | 13.73 | -16.62 | 0.38 | 0.006 | NC |  |  |  |
| 394 | 7-082 | 2.15 | 8.3 | | | 0.32 | -5.36 | | 13.73 | -16.62 | 0.38 | 0.004 | NC |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 395 | 7 UWC3 G1; | 2.89 | 5.04 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 396 | 7 UWC3 G1; | 2.98 | 5.35 | | | 0.43 |  | |  |  |  |  |  |  |  |  |
| 397 | 7 UWC3 G1; | 3.01 | 5.01 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 398 | 7 UWC3 G1; | 2.99 | 5.03 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.24** | | | **2SD:** | **0.38** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 399 | 7-029 | 2.23 | 8.28 | | | 0.26 | -5.61 | | 13.97 | -16.39 | 0.36 | 0.001 |  | 52.97 | 46.78 | 0.0 |
| 400 | 7-030 | 3.14 | 12.81 | | | 0.45 | -12.5 | | 25.63 | -5.08 | 0.36 | 0.009 | 2 | 52.12 | 47.92 | 0.1 |
| 401 | 7-037 | 3.23 | 12.34 | | | 0.47 | -12.5 | | 25.15 | -5.54 | 0.36 | 0.006 | 2 | 50.16 | 49.93 | 0.2 |
| 402 | 7-037a | 3.29 | 15.37 | | | 0.4 | -11.84 | | 27.54 | -3.22 | 0.36 | 0.007 | 2 | 53.05 | 46.55 | 0.4 |
| 403 | 7-038 | 3.24 | 12.51 | | | 0.63 | -12.5 | | 25.33 | -5.37 | 0.36 | 0.006 | 2 | 50.6 | 49.28 | 0.1 |
| 404 | 7-038a | 3.33 | 14.59 | | | 0.51 | -12.5 | | 27.44 | -3.32 | 0.36 | 0.010 | 2 | 53.44 | 46.08 | 0.2 |
| 405 | 7-043 | 0.02 | 32.95 | | | 26.24 | NA | | NA |  | NA | 0.277 | NC |  |  |  |
| 406 | 7-044 | 2.18 | 17.09 | | | 0.21 | -5.61 | | 22.83 | -7.79 | 0.36 | 0.002 | NC |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 407 | 7 UWC3 G1 | 3 | 4.73 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 408 | 7 UWC3 G1 | 3.04 | 4.89 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 409 | 7 UWC3 G1 | 3.04 | 4.89 | | | 0.57 |  | |  |  |  |  |  |  |  |  |
| 410 | 7 UWC3 G1 | 3.1 | 4.9 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.98** | | | **2SD:** | **0.36** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 6. 13 µm beam, 1.2 nA intensity. October 9th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 411 | 6 UWC3 G1 | 2.75 | 5.16 | | | 0.44 |  | |  |  |  |  |  |  |  |  |
| 412 | 6 UWC3 G1 | 2.83 | 5.16 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 413 | 6 UWC3 G1 | 2.87 | 5.13 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 414 | 6 UWC3 G1 | 2.88 | 4.96 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 415 | 6-004 | 2.12 | 8.21 | | | 0.26 | -5.49 | | 13.78 | -16.57 | 0.16 | 0.001 | NC |  |  |  |
| 416 | 6-005 | 2.76 | 19.24 | | | 0.63 | -12.38 | | 32.02 | 1.12 | 0.16 | 0.005 | Calcite | 97.35 | 2.28 | 0.5 |
| 417 | 6-005a | 3.05 | 16.42 | | | 0.41 | -12.38 | | 29.16 | -1.65 | 0.16 | 0.005 | 2 | 46.14 | 54.16 | 0.3 |
| 418 | 6-006 | 3.16 | 16.05 | | | 0.46 | -12.38 | | 28.78 | -2.02 | 0.16 | 0.005 | 2 |  |  |  |
| 419 | 6-007 | 2.74 | 18.85 | | | 0.53 | -12.38 | | 31.62 | 0.73 | 0.16 | 0.002 | 4 | 44.92 | 51.46 | 3.5 |
| 420 | 6-009 | 2.83 | 19.19 | | | 0.55 | -12.38 | | 31.97 | 1.07 | 0.16 | 0.004 | Calcite | 97.41 | 2.32 | 0.4 |
| 421 | 6-010 | 2.83 | 19.19 | | | 0.55 | -12.38 | | 31.97 | 1.07 | 0.16 | 0.001 | Calcite | 96.3 | 3.06 | 0.3 |
| 422 | 6-027 | 0.01 | -35.46 | | | 38.45 | NA | | NA |  | NA | 0.213 | Er |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 423 | 6 UWC3 G1 | 2.83 | 5.01 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 424 | 6 UWC3 G1 | 2.79 | 5.1 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 425 | 6 UWC3 G1 | 2.79 | 5.2 | | | 0.58 |  | |  |  |  |  |  |  |  |  |
| 426 | 6 UWC3 G1 | 2.78 | 5.09 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 427 | 6-027a | 0.07 | -1.13 | | | 8.49 | NA | | NA |  | NA | 0.074 | Er |  |  |  |
| 428 | 6-027b | 2.33 | 19.17 | | | 0.54 | NA | | NA |  | NA | 0.006 | Er |  |  |  |
| 429 | 6-027c | 0.03 | -3.65 | | | 20.26 | NA | | NA |  | NA | 0.136 | Er |  |  |  |
| 430 | 6-028 | 2.94 | 12.21 | | | 0.46 |  | |  |  | 0.25 | 0.007 | NF |  |  |  |
| 431 | 6-029 | 2.62 | 18.95 | | | 0.53 | -12.42 | | 31.77 | 0.88 | 0.25 | 0.007 | Calcite |  |  |  |
| 432 | 6-030 | 2.67 | 19.48 | | | 0.55 | -12.42 | | 32.3 | 1.39 | 0.25 | 0.004 | Calcite | 97.3 | 2.61 | 0.4 |
| 433 | 6-031 | 2.59 | 19.49 | | | 0.64 | -12.42 | | 32.31 | 1.40 | 0.25 | 0.006 | Calcite | 98.08 | 1.73 | 0.0 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 434 | 6 UWC3 G1 | 2.72 | 5.16 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 435 | 6 UWC3 G1 | 2.8 | 5.15 | | | 0.41 |  | |  |  |  |  |  |  |  |  |
| 436 | 6 UWC3 G1 | 2.96 | 4.81 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 437 | 6 UWC3 G1 | 2.99 | 4.97 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.1** | | | **2SD:** | **0.16** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 438 | 6-032 | 2.77 | 18.05 | | | 0.46 | -12.53 | | 30.97 | 0.10 | 0.3 | 0.004 | Calcite | 96.66 | 2.66 | 0.2 |
| 439 | 6-033 | 2.94 | 18.35 | | | 0.48 | -12.53 | | 31.27 | 0.39 | 0.3 | 0.004 | Calcite | 97.25 | 2.63 | 0.3 |
| 440 | 6-034 | 2.86 | 19.34 | | | 0.55 | -12.53 | | 32.27 | 1.36 | 0.3 | 0.007 | Calcite | 98.25 | 2.45 | 0.1 |
| 441 | 6-035 | 2.91 | 18.89 | | | 0.57 | -12.53 | | 31.81 | 0.92 | 0.3 | 0.004 | Calcite | 97.96 | 2.7 | 0.0 |
| 442 | 6-036 | 3.36 | 15.93 | | | 0.48 | -9.76 | | 25.94 | -4.78 | 0.3 | 0.002 | 3 | 42.99 | 54.48 | 2.1 |
| 443 | 6-037 | 3.27 | 12.93 | | | 0.48 | -9.76 | | 22.91 | -7.72 | 0.3 | 0.003 | 1 | 45.89 | 53.17 | 2.1 |
| 444 | 6-038 | 2.87 | 17.93 | | | 0.54 | -12.53 | | 30.84 | -0.02 | 0.3 | 0.004 | Calcite | 97.27 | 2.84 | 0.0 |
| 445 | 6-039 | 2.88 | 19.21 | | | 0.49 | -12.53 | | 32.14 | 1.24 | 0.3 | 0.005 | Calcite | 99.17 | 1.35 | 0.1 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 446 | 6 UWC3 G1 | 2.97 | 4.87 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 447 | 6 UWC3 G1 | 2.96 | 4.88 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
| 448 | 6 UWC3 G1 | 2.93 | 4.81 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.95** | | | **2SD:** |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 449 | 6-040 | 2.87 | 19.61 | | | 0.48 | -12.42 | | 32.44 | 1.53 | 0.43 | 0.002 | Calcite | 97.73 | 1.73 | 0.4 |
| 450 | 6-040a | 3.27 | 15.7 | | | 0.44 | -9.06 | | 24.99 | -5.70 | 0.43 | 0.002 | 1 | 46.2 | 54.03 | 0.4 |
| 451 | 6-059 | 2.83 | 20.08 | | | 0.48 | -12.42 | | 32.91 | 1.98 | 0.43 | 0.002 | Calcite | 97.93 | 2.05 | 0.1 |
| 452 | 6-059a | 2.82 | 19.4 | | | 0.6 | -12.42 | | 32.22 | 1.32 | 0.43 | 0.004 | Calcite | 99.09 | 1.33 | 0.0 |
| 453 | 6-059b | 2.76 | 19.83 | | | 0.53 | -12.42 | | 32.66 | 1.74 | 0.43 | 0.005 | Calcite | 99.13 | 0.73 | 0.3 |
| 454 | 6-062 | 2.81 | 18.8 | | | 0.48 | -12.42 | | 31.62 | 0.73 | 0.43 | 0.005 | Calcite | 97.93 | 2.06 | 0.1 |
| 455 | 6-063 | 2.8 | 19.29 | | | 0.53 | -12.42 | | 32.11 | 1.21 | 0.43 | 0.007 | Calcite | 98.45 | 1.99 | 0.0 |
| 456 | 6-064 | 2.83 | 18.69 | | | 0.52 | -12.42 | | 31.51 | 0.63 | 0.43 | 0.002 | Calcite | 99.27 | 0.9 | 0.0 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 457 | 6 UWC3 G1 | 2.84 | 5.4 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 458 | 6 UWC3 G1 | 2.85 | 5.08 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 459 | 6 UWC3 G1 | 2.84 | 5.11 | | | 0.59 |  | |  |  |  |  |  |  |  |  |
| 460 | 6 UWC3 G1 | 2.85 | 5.24 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.06** | | | **2SD:** | **0.43** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 461 | 6-074 | 2.75 | 19.25 | | | 0.57 | -12.25 | | 31.89 | 1.00 | 0.22 | 0.003 | Calcite | 97.51 | 2.48 | 0.0 |
| 462 | 6-075 | 2.75 | 19.47 | | | 0.55 | -5.6 | | 25.21 | -5.48 | 0.22 | 0.004 | 4 | 43.6 | 54.03 | 0.4 |
| 463 | 6-075 | 2.75 | 19.47 | | | 0.55 | -5.6 | | 25.21 | -5.48 | 0.22 | 0.004 | Cal rep site number | 97.05 | 2.19 | 0.0 |
| 464 | 6-077 | 2 | 15.64 | | | 0.3 | -5.36 | | 21.12 | -9.45 | 0.22 | 0.001 | NC |  |  |  |
| 465 | 6-077a | 1.99 | 15.96 | | | 0.3 | -5.36 | | 21.44 | -9.14 | 0.22 | 0.001 | NC |  |  |  |
| 466 | 6-077b | 2.07 | 8.37 | | | 0.27 | -5.36 | | 13.81 | -16.54 | 0.22 | 0.001 | NC |  |  |  |
| 467 | 6-077c | 2.06 | 8.66 | | | 0.3 | -5.36 | | 14.1 | -16.26 | 0.22 | 0.001 | NC |  |  |  |
| 468 | 6-070 | 2.71 | 19.5 | | | 0.5 |  | |  |  | 0.22 | 0.004 | Er |  |  |  |
| 469 | 6-071 | 3.18 | 16.61 | | | 0.37 | -12.25 | | 29.22 | -1.59 | 0.22 | 0.002 | Calcite | 97.3 | 2.46 | 0.2 |
| 470 | 6-068 | 2.85 | 15.57 | | | 0.34 | -12.25 | | 28.17 | -2.61 | 0.22 | 0.006 |  | 42 | 58.55 | 0.0 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 471 | 6 UWC3 G1 | 2.78 | 5.23 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 472 | 6 UWC3 G1 | 2.77 | 5.35 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 473 | 6 UWC3 G1 | 2.76 | 5.17 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
| 474 | 6 UWC3 G1 | 2.75 | 5.28 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.23** | | | **2SD:** | **0.22** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 1. 13 µm beam, 1.2 nA intensity. October 9th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 475 | 1 UWC3 G1 | 2.98 | 5.29 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 476 | 1 UWC3 G1 | 2.84 | 5.27 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 477 | 1 UWC3 G1 | 2.78 | 5.19 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 478 | 1 UWC3 G1 | 2.72 | 5.05 | | | 0.56 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 479 | 1-084 | 2.8 | 13.06 | | | 0.6 | -12.35 | | 25.72 | -4.99 | 0.2 | 0.007 | 2 | 49.57 | 51.37 | 0.0 |
| 480 | 1-084a | 2.88 | 14.37 | | | 0.64 | -11.69 | | 26.37 | -4.36 | 0.2 | 0.008 | 2 | 49.45 | 50.75 | 0.0 |
| 481 | 1-085 | 2.84 | 12.7 | | | 0.52 | -12.35 | | 25.35 | -5.35 | 0.2 | 0.008 | 2 | 50.05 | 49.94 | 0.0 |
| 482 | 1-101 | 2.76 | 13.95 | | | 0.58 | -12.35 | | 26.62 | -4.12 | 0.2 | 0.009 | 4 | 49.45 | 50.75 | 0.7 |
| 483 | 1-102 | 2.76 | 12.63 | | | 0.42 | -12.35 | | 25.29 | -5.41 | 0.2 | 0.005 | 4 | 47.69 | 56.15 | 1.4 |
| 484 | 1-103 | 2.81 | 13.7 | | | 0.5 | -12.35 | | 26.37 | -4.36 | 0.2 | 0.008 | 4 | 50.69 | 50.53 | 0.2 |
| 485 | 1-104 | 2.78 | 14.16 | | | 0.49 |  | |  |  | 0.2 | 0.007 | Er |  |  |  |
| 486 | 1-105 | 2.99 | 14.47 | | | 0.4 | -12.39 | | 27.2 | -3.55 | 0.16 | 0.005 | 4 | 48.66 | 52.15 | 0.0 |
| 487 | 1-106 | 2.96 | 13.04 | | | 0.44 | -12.39 | | 25.74 | -4.97 | 0.16 | 0.008 | 4 | 48.85 | 50.37 | 1.0 |
| 488 | 1-107 | 2.95 | 12.36 | | | 0.57 | -12.39 | | 25.06 | -5.63 | 0.16 | 0.006 | 4 | 47.98 | 52.14 | 0.2 |
| 489 | 1-108 | 2.93 | 13.37 | | | 0.44 | -12.39 | | 26.08 | -4.64 | 0.16 | 0.007 | 2 | 49.88 | 54.21 | 0.2 |
| 490 | 1-109 | 2.93 | 12.97 | | | 0.46 | -12.39 | | 25.68 | -5.03 | 0.16 | 0.011 | 2 | 45.84 | 54.92 | 1.3 |
| 491 | 1-110 | 2.89 | 13.61 | | | 0.48 | -12.39 | | 26.32 | -4.41 | 0.16 | 0.008 | 3 | 47.54 | 52.23 | 0.0 |
| 492 | 1-111 | 2.01 | 14.2 | | | 0.21 | -5.5 | | 19.81 | -10.72 | 0.16 | 0.001 | NC |  |  |  |
| 493 | 1-112 | 2.88 | 12.22 | | | 0.48 |  | |  | -29.94 | 0.16 | 0.006 | Er |  |  |  |
| 494 | 1-113 | 2.84 | 13.6 | | | 0.38 | -12.39 | | 26.31 | -4.42 | 0.16 | 0.005 | 2 | 48.17 | 52 | 0.0 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 495 | 1 UWC3 G1 | 2.73 | 5.2 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 496 | 1 UWC3 G1 | 2.66 | 5.12 | | | 0.75 |  | |  |  |  |  |  |  |  |  |
| 497 | 1 UWC3 G1 | 2.7 | 5.19 | | | 0.46 |  | |  |  |  |  |  |  |  |  |
| 498 | 1 UWC3 G1 | 2.9 | 4.94 | | | 0.48 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **5.16** | | | **2SD:** | **0.23** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 499 | 1-114 | 3.19 | 12.61 | | | 0.46 |  | |  |  | 0.41 | 0.006 | Er |  |  |  |
| 500 | 1-115 | 3.18 | 11.83 | | | 0.64 |  | |  |  | 0.41 | 0.016 | Er |  |  |  |
| 501 | 1-116 | 3.15 | 14.19 | | | 0.44 |  | |  |  | 0.41 | 0.007 | Er |  |  |  |
| 502 | 1-117 | 3.09 | 14.58 | | | 0.25 |  | |  |  | 0.41 | 0.013 | Er |  |  |  |
| 503 | 1-118 | 3.22 | 11.11 | | | 0.66 |  | |  |  | 0.41 | 0.021 | Er |  |  |  |
| 504 | 1-119 | 3.13 | 12.53 | | | 0.45 |  | |  |  | 0.41 | 0.007 | Er |  |  |  |
| 505 | 1-120 | 3.17 | 11.81 | | | 0.55 |  | |  |  | 0.41 | 0.008 | Er |  |  |  |
| 506 | 1-121 | 3.1 | 14.38 | | | 0.59 |  | |  |  | 0.41 | 0.007 | Er |  |  |  |
| 507 | 1-122 | 3.13 | 13.47 | | | 0.5 |  | |  |  | 0.41 | 0.006 | Er |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 508 | 1 UWC3 G1 | 3.02 | 4.73 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 509 | 1 UWC3 G1 | 2.99 | 4.97 | | | 0.56 |  | |  |  |  |  |  |  |  |  |
| 510 | 1 UWC3 G1 | 2.99 | 4.64 | | | 0.51 |  | |  |  |  |  |  |  |  |  |
| 511 | 1 UWC3 G1 | 2.96 | 4.97 | | | 0.54 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.97** | | | **2SD:** | **0.41** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| **Sample Mount No. 5. 13 µm beam, 1.2 nA intensity. October 9th 2015** | | | | | | | | |  |  |  |  |  |  |  |  |
| 512 | 5 UWC3 G2 | 3.04 | 4.92 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
| 513 | 5 UWC3 G2 | 3.01 | 5.11 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 514 | 5 UWC3 G2 | 3 | 4.94 | | | 0.5 |  | |  |  |  |  |  |  |  |  |
| 515 | 5 UWC3 G2 | 2.97 | 5.08 | | | 0.52 |  | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 516 | 5-072 | 3.21 | 15.35 | | | 0.37 | -12.49 | | 28.19 | -2.59 | 0.16 | 0.003 | 2 | 49.75 | 50.2 | 0.0 |
| 517 | 5-101 | 2.09 | 10.6 | | | 0.38 | -5.6 | | 16.3 | -14.13 | 0.16 | 0.001 | NC |  |  |  |
| 518 | 5-102 | 2.99 | 11.28 | | | 0.53 | -11.98 | | 23.55 | -7.10 | 0.16 | 0.008 | 2 | 52.3 | 47.7 | 0.0 |
| 519 | 5-103 | 3.06 | 13.83 | | | 0.45 | -12.13 | | 26.28 | -4.45 | 0.16 | 0.006 | 3 | 50.1 | 49.9 | 0.0 |
| 520 | 5-104 | 2.14 | 5.23 | | | 0.28 | -5.6 | | 10.89 | -19.38 | 0.16 | 0.001 | NC |  |  |  |
| 521 | 5-105 | 2.08 | 3.69 | | | 0.28 | -5.6 | | 9.35 | -20.87 | 0.16 | 0.008 | NC |  |  |  |
| 522 | 5-106 | 2.13 | 5.87 | | | 0.25 | -5.6 | | 11.54 | -18.75 | 0.16 | 0.001 | NC |  |  |  |
| 523 | 5-107 | 2.94 | 14.7 | | | 0.54 | -12.49 | | 27.54 | -3.22 | 0.16 | 0.003 | 4 | 50.85 | 49.1 | 0.3 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 524 | 5 UWC3 G2 | 2.91 | 4.9 | | | 0.49 |  | |  |  |  |  |  |  |  |  |
| 525 | 5 UWC3 G2 | 2.91 | 4.99 | | | 0.47 |  | |  |  |  |  |  |  |  |  |
| 526 | 5 UWC3 G2 | 2.88 | 4.93 | | | 0.45 |  | |  |  |  |  |  |  |  |  |
| 527 | 5 UWC3 G2 | 2.89 | 5.03 | | | 0.43 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.99** | | | **2SD:** | **0.16** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 528 | 5-108 | 2.86 | 14.6 | | | 0.35 | -12.29 | | 27.22 | -3.53 | 0.14 | 0.004 | 6 | 51.51 | 48.03 | 0.3 |
| 529 | 5-109 | 3.15 | 17.58 | | | 0.4 | -12.48 | | 30.44 | -0.41 | 0.14 | 0.001 | 6 | 50.8 | 46.54 | 6.9 |
| 530 | 5-110 | 2.08 | 5.64 | | | 0.23 | -5.63 | | 11.34 | -18.94 | 0.14 | 0.001 | NC |  |  |  |
| 531 | 5-111 | 2.08 | 5.56 | | | 0.25 | -5.63 | | 11.26 | -19.02 | 0.14 | 0.001 | NC |  |  |  |
| 532 | 5-112 | 2.08 | 5.8 | | | 0.27 | -5.63 | | 11.5 | -18.78 | 0.14 | 0.001 | NC |  |  |  |
| 533 | 5-113 | 3.05 | 15.47 | | | 0.47 | -12.52 | | 28.35 | -2.44 | 0.14 | 0.002 | 2 | 52.16 | 44.41 | 3.2 |
| 534 | 5-114 | 3.01 | 18.42 | | | 0.37 | -12.52 | | 31.34 | 0.46 | 0.14 | 0.005 | 3 | 50.43 | 50.01 | 0.3 |
| 535 | 5-115 | 2.97 | 14.19 | | | 0.42 | -12.52 | | 27.05 | -3.70 | 0.14 | 0.002 | 4 | 52.3 | 47.98 | 0.1 |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 536 | 5 UWC3 G2 | 2.82 | 5.01 | | | 0.45 |  | |  |  |  |  |  |  |  |  |
| 537 | 5 UWC3 G2 | 2.82 | 4.82 | | | 0.53 |  | |  |  |  |  |  |  |  |  |
| 538 | 5 UWC3 G2 | 2.82 | 4.97 | | | 0.58 |  | |  |  |  |  |  |  |  |  |
| 539 | 5 UWC3 G2 | 2.81 | 5.02 | | | 0.41 |  | |  |  |  |  |  |  |  |  |
|  |  | **Average:** | **4.96** | | | **2SD:** | **0.14** | |  |  |  |  |  |  |  |  |
|  |  |  |  | | |  |  | |  |  |  |  |  |  |  |  |
| 540 | 5-116 | 2.04 | 6.99 | | | 0.26 | -5.63 | | 12.7 | -17.62 | 0.14 | 0.001 | NC |  |  |  |
| 541 | 5-117 | 2.96 | 13.78 | | | 0.55 | -12.52 | | 26.63 | -4.11 | 0.14 | 0.001 | 4 | 51.29 | 48.6 | 0.1 |
| 542 | 5-118 | 2.92 | 12.88 | | | 0.41 | -12.52 | | 25.73 | -4.98 | 0.14 | 0.003 | 4 | 51.06 | 49.43 | 0.5 |
| 543 | 5-119 | 1.96 | 8.79 | | | 0.2 | -5.63 | | 14.5 | -15.87 | 0.14 | 0.001 | NC |  |  |  |
| 544 | 5-120 | 1.94 | 9.77 | | | 0.26 | -5.63 | | 15.49 | -14.91 | 0.14 | 0.001 | NC |  |  |  |
| 545 | 5-121 | 1.93 | 9.88 | | | 0.27 | -5.63 | | 15.6 | -14.81 | 0.14 | 0.001 | NC |  |  |  |
| 546 | 5-122 | 2.83 | 12.4 | | | 0.39 | -12.52 | | 25.23 | -5.47 | 0.14 | 0.003 | 2 | 50.52 | 49.59 | 0.4 |

**Pit Analysis**

After ion microprobe analysis a combination of Scanning Electron (SE), Back Scattered (BSE) microscopy and Wavelength Dispersive Spectroscopy (SEM-WDS) was used to relocate and characterise each individual pit. Pits with an irregular morphology were excluded. In this study ‘pit irregularity’ is defined as and includes pits which are positioned on cracks, spots which break into crystals and/or inclusions other than the target mineral and spots which overlap pores and vugs. Analyses which were not of calcite or dolomite were also excluded. Analyses were also excluded where the pit could not be found or the pit identity confirmed. An explanation each excluded analysis is given in Table X. In total 111 measurements were excluded from a total of 308 analyses

**  
Figure 1 -** Examples of SIMS pits a) Regular pit, positioned in the centre of a calcite crystal in sample 2-55B; note the ellipsoidal shape and size. Note, the pit is shown rotated 90⁰ to the orientation it was created in; b) Irregular pit positioned at the edge of calcite cement, breaking into a second mineral (mineral 2), contaminating the ablated sample, in sample 2-55B.

**Table 2** – Details of pits excluded from further interpretations. Not found = where the pit couldn’t be located for integrity checking. Other Mineral = analyses of minerals other than calcite or dolomite and were commonly feldspar or quartz. Error = Refers to low count rates obtained by the detector.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Analysis ID** | **Explanation** |  | **Analysis ID** | **Explanation** |  | **Analysis ID** | **Explanation** |  | **Analysis ID** | **Explanation** |
| 1-051b | Irregularity | 2-032 | Not Found | 3-084 | Other Mineral | 6-075 | Not Found |
| 1-052 | Error | 2-034 | Not Found | 3-084a | Other Mineral | 6-077 | Other Mineral |
| 1-054 | Not Found | 2-035 | Not Found | 3-085 | Other Mineral | 3-086 | Not Found |
| 1-067g | Not Found | 2-036 | Not Found | 4-008 | Other Mineral | 3-092 | Other Mineral |
| 1-073 | Irregularity | 2-038 | Not Found | 4-011 | Irregularity | 6-077a | Other Mineral |
| 1-075 | Irregularity | 2-041 | Not Found | 4-038 | Other Mineral | 6-077b | Other Mineral |
| 1-084a | Not Found | 2-043 | Not Found | 4-043 | Irregularity | 6-077c | Other Mineral |
| 1-104 | Error | 2-045 | Not Found | 4-066 | Not Found | 7-006 | Other Mineral |
| 1-111 | Other Mineral | 2-048 | Irregularity | 4-069 | Other Mineral | 7-020 | Other Mineral |
| 1-112 | Error | 2-061 | Other Mineral | 4-086 | Other Mineral | 7-021 | Other Mineral |
| 1-114 | Error | 3-006 | Other Mineral | 4-100 | Other Mineral | 7-023 | Other Mineral |
| 1-115 | Error | 3-011 | Other Mineral | 5-005 | Other Mineral | 7-024 | Other Mineral |
| 1-116 | Error | 3-012 | Other Mineral | 5-028 | Other Mineral | 7-029 | Irregularity |
| 2-005 | Not Found | 3-017 | Irregularity | 5-028a | Other Mineral | 7-040 | Other Mineral |
| 2-007 | Other Mineral | 3-025 | Irregularity | 5-028b | Other Mineral | 7-041a | Other Mineral |
| 2-008 | Not Found | 3-029 | Other Mineral | 5-053 | Other Mineral | 7-043 | Other Mineral |
| 2-009 | Irregularity | 3-030 | Other Mineral | 5-082 | Other Mineral | 7-044 | Other Mineral |
| 2-009-2 | Other Mineral | 3-031 | Other Mineral | 5-084 | Error | 7-048 | Irregularity |
| 2-009-3 | Other Mineral | 3-033 | Not Found | 5-089 | Other Mineral | 7-051 | Irregularity |
| 2-013 | Not Found | 3-034 | Not Found | 6-004 | Other Mineral | 7-053 | Other Mineral |
| 2-018 | Other Mineral | 3-035 | Other Mineral | 6-006 | Not Found | 7-060 | Other Mineral |
| 2-021 | Other Mineral | 3-036 | Not Found | 6-027 | Error | 7-075 | Irregularity |
| 2-022 | Not Found | 3-037 | Not Found | 6-027a | Error | 7-079 | Not Found |
| 2-022b | Not Found | 3-038 | Not Found | 6-027b | Error | 7-081b | Other Mineral |
| 2-027 | Not Found | 3-039 | Not Found | 6-027c | Error | 7-082 | Other Mineral |
| 2-028a | Other Mineral | 3-040 | Not Found | 6-028 | NC | 7-098 | Other Mineral |
| 2-030 | Not Found | 3-041 | Irregularity | 6-068 | Irregularity | 7-098 | Other Mineral |
| 2-031 | Not Found | 3-081 | Error | 6-070 | Error |

**Iron Correction**

(a) Plot relating the SIMS δ18O bias (‰) to the cation composition of the dolomite–ankerite solid solution series [Fe# = Fe/(Mg+Fe)] for a typical calibration using a 10μm diameter spot size. The sample matrix effect can be accurately estimated using the Hill equation, which is commonly employed to describe relations of ‘concentration’ versus ‘measured effect’ type, especially in systems that behave non-linearly and reach saturation. (b) Plot of the calibration residual. For most reference materials in the suite, the averaged measured value of δ18O bias\*(RMUW6220) differs by < 0.3‰ from the value predicted by the calibration (depicted by solid lines). Modified from Sliwinski et al., (2015). Figure from Orland et al., pers. com. (2015).

