# **Appendix**

# Si isotope analysis by LA-ICPMS additional report

## Femtosecond (fs) laser ablation multi collector inductively coupled plasma mass spectrometry routine

The laser aerosol is transported into the multi collector using a stream of helium. The gas flows, torch position, and ion optics were tuned daily for highest intensity and mass bias stability, while maintaining the 14N16O+ interference on 30Si+ at resolvable levels (<10 V). To further reduce the mass bias during non-matrix matched analyses, water was added to the helium laser aerosol using a Y-piece and a nominal 50 µL/min PFA nebuliser. The ion optics were operated at medium mass resolution with a typical mass resolving power m/Δm > 5000 to resolve isobaric interferences (mainly 14N16O+ on 30Si+). Faraday detectors (equipped with 1011 Ω amplifiers) were positioned to measure on interference-free, flat-top peak shoulders. The Faraday cup configuration is reported in Table A.1.

In every analytical session two reference materials (BHVO-2 and GOR132-G) were repeatedly analyzed in between the samples, and compared to published values (see compilations in Jochum et al. (2005) and Schuessler and Von Blanckenburg (2014)). Table A.4 reports the individual results, and Table A.5 the average silicon isotope compositions determined over the three analytical sessions for BHVO-2 and GOR132-G.

## Instrument Settings

The following tables Table A.1 – Table A.3 report the typical settings used for the three analytical sessions.

Table A.1: Instrument configuration of Faraday cup and amplifier settings for fsLA MC-ICP-MS Si isotope analyses.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Faraday Cup | L4 | L2 | C | H2 |
| Isotope | 27Al | 28Si | 29Si | 30Si |
| Amplifier | 1011 Ω | 1011 Ω | 1011 Ω | 1011 Ω |

*Table A.2: Typical laser settings used throughout the study. \*Laser repetition rate was adjusted to attain uniform 28Si ion beam intensities during measurements (matched to bracketing standard signal intensity).*

|  |  |  |
| --- | --- | --- |
| Crater size | 25 | [µm] |
| Repetition rate\* | 15-125 | [Hz] |
| Scan velocity | 40 | [µm/s] |
| Energy density | 1.0 | J/cm² |
| Wavelength | 196 | [nm] |

Table A.3: Instrument settings used for in situ fsLA MC-ICP-MS Si isotope analyses. \*Parameters tuned for best sensitivity, stability, and peak shape before each measurement session. Auxiliary and nebuliser gas flows were within 0.1 L min-1 for the different measurement sessions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Cool Gas Flow | 15.00 | [L min-1] | Extraction Lens | -2000 | [V] |
| Auxiliary Gas Flow\* | 0.65 | [L min-1] | Focus Lens\* | -582 | [V] |
| Nebuliser Gas Flow\* | 0.53 | [L min-1] | X-Deflection\* | -4.45 | [V] |
| Helium Gas Flow\* | 1.2 | [L min-1] | Y-Deflection\* | -1.58 | [V] |
| RF Power | 1250 | [W] | Shape\* | 205 | [V] |
| Torch: |  |  | Rotation Quad 1\* | -12.13 | [V] |
| X\* | 1.200 | [mm] | Source Offset | 0.0 | [V] |
| Y\* | -3.690 | [mm] | Focus Quad 1\* | -19.89 | [V] |
| Z\* | -0.890 | [mm] | Rotation Quad 2\* | 0.0 | [V] |
| Sampler Cone | Ni | Jet | Focus Offset | 50.00 | [V] |
| Skimmer Cone | Ni | H | Matsuda Plate | 0.01 | [V] |
| Focus Quad\* | -2.20 | [V] |  |  |  |
| Dispersion | 0.0 | [V] |  |  |  |
| PFA Nebuliser with a measured uptake rate of 50 µL/min | | | | | |
| Cycles | 200 |  | Integration time | 1.049 | [s/cycle] |

Data evaluation

Raw data processing and background corrections were made according to the protocol described in Schuessler and Von Blanckenburg (2014) that involves application of several data rejection/acceptance criteria. Of these, the most important ones are that A) only 30/28Si and 29/28Si ratios are used for the calculation which deviate less than 3SD from the mean and B) only results which follow the mass-depended terrestrial fractionation line in a three-isotope-plot of δ29Si vs. δ30Si within analytical uncertainties and C) have a mass bias drift between the two bracketing standards of less than 0.30 ‰ in 30/28Si are accepted and reported in this study.

## Data quality

In all three analytical sessions, two reference materials were repeatedly analyzed. There is a good agreement between the *in situ* determined isotope ratios and the literature values. A possible problem in the quality of the reported results could be in the last bracket of sample U1493B-9X-CC (measurement number 104-130). The succeeding standards show larger deviations in Δ’30Si (the deviation of the isotope ratios from the terrestrial fractionation line, calculated as: Δ’30Si = δ30Si - 1.93∙δ29Si) and also larger deviation from the literature values. Thus, the measurements 104-130 can potentially be affected by larger uncertainties. Table A.4 reports the individual results, and Table A.5 the average silicon isotope compositions determined over the three analytical sessions for BHVO-2 and GOR132-G.

Table A.4: δ29/28Si and δ30/28Si values of the repeated analysis of GOR132-G and BHVO-2 (reported relative to NBS28) with combined expanded standard uncertainties based on propagated statistical uncertainties of n cycles (with 1.049 s integration time per cycle) of the sample and the two bracketing measurement standards (2SE=(t∙s)/√n). †these are two standard deviations and not two standard errors.

| Sample Name | | δ29/28Si NBS28 | | 2SE | δ30/28Si NBS28 | 2SE | Cycles | comment |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample U1498B-4R-1 | | | | | | | | |
| 002-BHVO2 | | -0.14 | | 0.07 | -0.38 | 0.08 | 83 |  |
| 004-BHVO2 | | -0.15 | | 0.06 | -0.45 | 0.08 | 83 |  |
| 014-GOR132-G | | -0.21 | | 0.06 | -0.37 | 0.10 | 78 |  |
| 016-GOR132-G | | -0.20 | | 0.07 | -0.43 | 0.08 | 78 |  |
| 038-BHVO2 | | -0.09 | | 0.07 | -0.31 | 0.10 | 76 |  |
| 040-BHVO2 | | -0.12 | | 0.07 | -0.30 | 0.09 | 76 |  |
| 042-GOR132-G | | -0.19 | | 0.08 | -0.32 | 0.09 | 77 |  |
| 044-GOR132-G | | -0.16 | | 0.06 | -0.25 | 0.09 | 77 |  |
| 066-BHVO2 | | -0.24 | | 0.07 | -0.24 | 0.09 | 76 |  |
| 068-BHVO2 | | -0.25 | | 0.07 | -0.21 | 0.09 | 77 | Higher Δ’ (>0.23 – 0.30 ‰) |
| 070-GOR132-G | | -0.21 | | 0.07 | -0.36 | 0.10 | 75 |  |
| 072-GOR132-G | | -0.32 | | 0.08 | -0.38 | 0.10 | 77 | Higher Δ’ (>0.23 – 0.30 ‰) |
| 094-BHVO2 | | -0.07 | | 0.07 | -0.39 | 0.09 | 77 | Higher Δ’ (>0.23 – 0.30 ‰) |
| 096-BHVO2 | | -0.13 | | 0.07 | -0.15 | 0.09 | 74 |  |
| 098-GOR132-G | | -0.07 | | 0.07 | -0.19 | 0.09 | 76 |  |
| 100-GOR132-G | | -0.23 | | 0.07 | -0.35 | 0.09 | 76 |  |
|  | |  | |  |  |  |  |  |
|  | Averages | | | | | | | |
| BHVO-2 | | **-0.15** | | **†0.13** | **-0.30** | **†0.20** |  | n=8 |
| GOR132-G | | **-0.20** | | **†0.14** | **-0.33** | **†0.16** |  | n=8 |
|  | **Sample U1491B-5H-CC** | | | | | | | |
| 008-BHVO-2 | | -0.30 | | 0.07 | -0.42 | 0.10 | 83 |  |
| 010-BHVO-2 | | -0.11 | | 0.06 | -0.27 | 0.08 | 83 |  |
| 012-GOR132-G | | -0.17 | | 0.06 | -0.46 | 0.08 | 81 |  |
| 014-GOR132-G | | -0.19 | | 0.05 | -0.35 | 0.08 | 82 |  |
| 016-GOR132-G | | -0.15 | | 0.06 | -0.37 | 0.09 | 82 |  |
| 021-BHVO-2 | | -0.18 | | 0.05 | -0.45 | 0.07 | 83 |  |
| 023-BHVO-2 | | -0.24 | | 0.05 | -0.49 | 0.06 | 82 |  |
| 025-GOR132-G | | -0.20 | | 0.05 | -0.46 | 0.07 | 82 |  |
| 027-GOR132-G | | -0.24 | | 0.06 | -0.40 | 0.07 | 80 |  |
| 049-BHVO-2 | | -0.27 | | 0.06 | -0.49 | 0.07 | 82 |  |
| 051-BHVO-2 | | -0.26 | | 0.05 | -0.47 | 0.07 | 81 |  |
| 053-GOR132-G | | -0.16 | | 0.05 | -0.33 | 0.08 | 82 |  |
| 055-GOR132-G | | -0.22 | | 0.06 | -0.47 | 0.06 | 82 |  |
| 079-BHVO-2 | | -0.21 | | 0.05 | -0.40 | 0.06 | 81 |  |
| 081-BHVO-2 | | -0.20 | | 0.05 | -0.37 | 0.07 | 82 |  |
| 083-GOR132-G | | -0.15 | | 0.05 | -0.32 | 0.07 | 82 |  |
| 085-GOR132-G | | -0.13 | | 0.05 | -0.28 | 0.06 | 80 |  |
|  | |  | |  |  |  |  |  |
|  | Averages | | | | | | | |
| BHVO-2 | | **-0.22** | | **†0.12** | **-0.42** | **†0.15** |  | n=8 |
| GOR132-G | | **-0.18** | | **†0.07** | **-0.38** | **†0.14** |  | n=9 |
|  | **Sample U1493B-9X-CC** | | | | | | | |
| 006-BHVO-2 | | | -0.13 | 0.09 | -0.18 | 0.12 | 83 |  |
| 008-BHVO-2 | | | -0.06 | 0.10 | -0.19 | 0.13 | 83 |  |
| 010-BHVO-2 | | | -0.08 | 0.09 | -0.09 | 0.12 | 83 |  |
| 012-GOR132-G | | | -0.06 | 0.10 | -0.28 | 0.13 | 84 |  |
| 016-GOR132-G | | | -0.11 | 0.09 | -0.23 | 0.14 | 83 |  |
| 040-BHVO-2 | | | -0.22 | 0.09 | -0.42 | 0.12 | 86 | Larger Bracket (no adjacent SSB) |
| 042-BHVO-2 | | | -0.10 | 0.08 | -0.30 | 0.11 | 83 |  |
| 044-GOR132-G | | | -0.10 | 0.08 | -0.21 | 0.11 | 85 |  |
| 046-GOR132-G | | | -0.04 | 0.08 | -0.26 | 0.11 | 84 |  |
| 068-BHVO-2 | | | -0.21 | 0.09 | -0.19 | 0.11 | 84 |  |
| 070-BHVO-2 | | | -0.14 | 0.09 | -0.31 | 0.12 | 84 |  |
| 072-GOR132-G | | | -0.18 | 0.08 | -0.28 | 0.10 | 90 |  |
| 074-GOR132-G | | | -0.06 | 0.09 | -0.11 | 0.10 | 93 |  |
| 096-BHVO-2 | | | -0.10 | 0.07 | -0.16 | 0.11 | 92 |  |
| 098-BHVO-2 | | | -0.15 | 0.09 | -0.16 | 0.10 | 93 |  |
| 100-GOR132-G | | | -0.16 | 0.08 | -0.21 | 0.10 | 94 |  |
| 102-GOR132-G | | | -0.15 | 0.08 | -0.19 | 0.10 | 90 |  |
| \*132-BHVO-2 | | | -0.10 | 0.08 | 0.04 | 0.11 | 85 | Higher Δ’ (>0.23 – 0.30 ‰) |
| \*134-BHVO-2 | | | 0.01 | 0.08 | -0.05 | 0.09 | 86 |  |
| \*136-GOR132-G | | | 0.03 | 0.08 | -0.20 | 0.11 | 87 | Higher Δ’ (>0.23 – 0.30 ‰) |
| \*138-GOR132-G | | | -0.05 | 0.08 | -0.28 | 0.10 | 85 |  |
|  | | |  |  |  |  |  |  |
|  | Averages | | | | | | | |
| BHVO-2 | | **-0.12** | | **†0.13** | **-0.18** | **†0.26** |  | n=11 |
| GOR132-G | | **-0.09** | | **†0.13** | **-0.23** | **†0.11** |  | n=10 |

\* Quality control showed larger deviations for the two reference materials, thus there is a higher uncertainty on the isotope ratios determined before these samples.

*Table A.5: Average δ29/28Si and δ30/28Si composition with two standard deviations of BHVO-2 and GOR132-G over the three analytical sessions and comparison with literature values*.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *In situ* fsLA MC-ICP-MS results | | | | | Averages of published values\* | | | |
|  | δ29/28Si NBS28 | 2 s | δ30/28Si NBS28 | 2 s | n | δ29/28Si NBS28 | 2 s | δ30/28Si NBS28 | 2 s |
| BHVO-2 | -0.16 | 0.15 | -0.29 | 0.29 | 27 | -0.14 | 0.05 | -0.28 | 0.09 |
| GOR132-G | -0.15 | 0.15 | -0.31 | 0.19 | 27 | -0.15 | 0.12 | -0.27 | 0.21 |

\*for BHVO-2 (van den Boorn et al., 2006; Abraham et al., 2008; Fitoussi et al., 2009; Savage et al., 2010; Opfergelt et al., 2011; Savage et al., 2011; Zambardi and Poitrasson, 2011; Armytage et al., 2011; Armytage et al., 2012; Opfergelt et al., 2012; Pogge von Strandmann et al., 2012; Savage et al., 2012; Kempl et al., 2013; Pringle et al., 2013; Savage et al., 2013b; Savage et al., 2013a; Savage and Moynier, 2013; Geilert, Vroon and van Bergen, 2014; Geilert, Vroon, Roerdink, et al., 2014; Dauphas et al., 2015; Geilert et al., 2015; Tatzel et al., 2015; Mavromatis et al., 2016; Pringle et al., 2016; Reddy et al., 2016; Zheng et al., 2016; Chen et al., 2017), for GOR132-G (Jochum et al., 2011)

1. Si isotope results – supplementary tables

*Table A.6: Si isotope compositions of serpentine in mesh and bastite textures and in veins as well as general geochemistry of representative samples. Standard deviation of vein generation averages is only given if sample number is > 2.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | | | |  | | | | | | | |  | | | | | | | | | | | fsLAMC-ICPMS | | | | | | | | | | | | | | | | | |  | |  | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | | EMPA | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| sample | | Phase | | | | | Label | | | | | | | | Generation  (#) | | | | | | | | | | | δ29Si | | | | | | | | 2SE | | | | | | | | δ30Si | | | | | | | | | 2SE | | | | generation δ30Siaverage | | | | | | | | 1SD | | | | | | |  | | | MgO | | | | | | | | | FeO | | | | | | | | | | | SiO2 | | | | | | | | | |  | | | | | | Si/  (Mg+Fe) | | | | | | | | | | | | | | | |
|  | |  | | | | |  | | | | | | | |  | | | | | | | | | | | (‰) | | | | | | | | (‰) | | | | | | | | (‰) | | | | | | | | | (‰) | | | | (‰) | | | | | | | | (‰) | | | | | | |  | | | (wt%) | | | | | | | | | (wt%) | | | | | | | | | | | (wt%) | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Yinazao (U1491B-5H-CC)** | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 059-91-15M1 | | unserp. olivine | | | | | 0-b | | | | | | | | 0 | | | | | | | | | | | -0.27 | | | | | | | | 0.06 | | | | | | | | -0.51 | | | | | | | | | 0.08 | | | | -0.52 | | | | | | | | 0.11 | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 061-91-15M2 | |  | | | | | 0-b | | | | | | | | 0 | | | | | | | | | | | -0.32 | | | | | | | | 0.05 | | | | | | | | -0.66 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 057-91-16M2 | | unserp.  olivine | | | | | 0-a | | | | | | | | 0 | | | | | | | | | | | -0.09 | | | | | | | | 0.07 | | | | | | | | -0.41 | | | | | | | | | 0.11 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 063-91-16M2b | |  | | | | | 0-a | | | | | | | | 0 | | | | | | | | | | | -0.18 | | | | | | | | 0.07 | | | | | | | | -0.47 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.22** | | | | | | | | **0.10** | | | | | | | | **-0.52** | | | | | | | | | **0.11** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
|  | |  | | | | |  | | | | | | | |  | | | | | | | | | | |  | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 001-91-1a1 | | Incipient  vein | | | | | 1-a | | | | | | | | 1 | | | | | | | | | | | -0.32 | | | | | | | | 0.07 | | | | | | | | -0.69 | | | | | | | | | 0.10 | | | | -0.36 | | | | | | | | 0.13 | | | | | | |  | | | 37.4 | | | | | | | | | 5.7 | | | | | | | | | | | 41.5 | | | | | | | | | |  | | | | | | 0.72 | | | | | | | | | | | | | | | |
| 020-91-1a2 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.18 | | | | | | | | 0.06 | | | | | | | | -0.26 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 011-91-1b | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.17 | | | | | | | | 0.05 | | | | | | | | -0.30 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 015-91-1c | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.26 | | | | | | | | 0.06 | | | | | | | | -0.35 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | | 37.3 | | | | | | | | | 5.6 | | | | | | | | | | | 41.8 | | | | | | | | | |  | | | | | | 0.73 | | | | | | | | | | | | | | | |
| 029-91-1d | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.14 | | | | | | | | 0.06 | | | | | | | | -0.28 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 035-91-9 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.08 | | | | | | | | 0.06 | | | | | | | | -0.27 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 039-91-6 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.10 | | | | | | | | 0.06 | | | | | | | | -0.36 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | | 37.4 | | | | | | | | | 5.6 | | | | | | | | | | | 42.2 | | | | | | | | | |  | | | | | | 0.73 | | | | | | | | | | | | | | | |
| 065-91-12 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.20 | | | | | | | | 0.06 | | | | | | | | -0.31 | | | | | | | | | 0.06 | | | |  | | | | | | | |  | | | | | | |  | | | 37.6 | | | | | | | | | 5.9 | | | | | | | | | | | 41.0 | | | | | | | | | |  | | | | | | 0.7 | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.18** | | | | | | | | **0.08** | | | | | | | | **-0.35** | | | | | | | | | **0.14** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 077-91-13 | | Incipient  vein | | | | | 1-c | | | | | | | | 1 | | | | | | | | | | | -0.24 | | | | | | | | 0.06 | | | | | | | | -0.50 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 075-91-14 | | Incipient  vein | | | | | 1-b | | | | | | | | 1 | | | | | | | | | | | -0.16 | | | | | | | | 0.06 | | | | | | | | -0.31 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
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| 005-91-2a1 | | Late  vein | | | | | 3.1-a | | | | | | | | 3 | | | | | | | | | | | -0.07 | | | | | | | | 0.06 | | | | | | | | -0.08 | | | | | | | | | 0.08 | | | | -0.10 | | | | | | | | 0.07 | | | | | | |  | | | 38.9 | | | | | | | | | 5.0 | | | | | | | | | | | 42.6 | | | | | | | | | |  | | | | | | 0.73 | | | | | | | | | | | | | | | |
| 007-91-2a2 | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.12 | | | | | | | | 0.06 | | | | | | | | -0.12 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 009-91-2b | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.12 | | | | | | | | 0.06 | | | | | | | | -0.24 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 013-91-2c | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.11 | | | | | | | | 0.06 | | | | | | | | -0.11 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | | 38.4 | | | | | | | | | 5.1 | | | | | | | | | | | 42.7 | | | | | | | | | |  | | | | | | 0.74 | | | | | | | | | | | | | | | |
| 019-91-2d | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.04 | | | | | | | | 0.06 | | | | | | | | -0.07 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 071-91-4a | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.10 | | | | | | | | 0.06 | | | | | | | | -0.06 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 073-91-4b | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.20 | | | | | | | | 0.06 | | | | | | | | -0.17 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.11** | | | | | | | | **0.05** | | | | | | | | **-0.12** | | | | | | | | | **0.07** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 031-91-F1 | | Late  vein | | | | | 3.1-b,c | | | | | | | | 3 | | | | | | | | | | | 0.07 | | | | | | | | 0.06 | | | | | | | | 0.02 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 037-91-F2 | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.01 | | | | | | | | 0.06 | | | | | | | | -0.09 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **0.03** | | | | | | | |  | | | | | | | | **-0.03** | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
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| 041-91-7a | | Late  vein | | | | | 3.2-a | | | | | | | | 3 | | | | | | | | | | | -0.28 | | | | | | | | 0.06 | | | | | | | | -0.49 | | | | | | | | | 0.07 | | | | -0.49 | | | | | | | | 0.08 | | | | | | |  | | | 37.6 | | | | | | | | | 5.5 | | | | | | | | | | | 43.7 | | | | | | | | | |  | | | | | | 0.76 | | | | | | | | | | | | | | | |
| 043-91-7b | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.24 | | | | | | | | 0.07 | | | | | | | | -0.50 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 045-91-7c | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.24 | | | | | | | | 0.06 | | | | | | | | -0.39 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 069-91-3 | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.30 | | | | | | | | 0.06 | | | | | | | | -0.38 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 067-91-10 | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.35 | | | | | | | | 0.05 | | | | | | | | -0.60 | | | | | | | | | 0.07 | | | |  | | | | | | | |  | | | | | | |  | | | 37.9 | | | | | | | | | 5.5 | | | | | | | | | | | 43.7 | | | | | | | | | |  | | | | | | 0.75 | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.28** | | | | | | | | **0.05** | | | | | | | | **-0.47** | | | | | | | | | **0.09** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 017-91-5 | | Late  vein | | | | | 3.2-b | | | | | | | | 3 | | | | | | | | | | | -0.27 | | | | | | | | 0.06 | | | | | | | | -0.54 | | | | | | | | | 0.08 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 033-91-8 | |  | | | | |  | | | | | | | | 3 | | | | | | | | | | | -0.18 | | | | | | | | 0.07 | | | | | | | | -0.54 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.22** | | | | | | | |  | | | | | | | | **-0.54** | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
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| **Fantangisña (U1498B-4R-1)** | | | | | | | | | | | | | | |  | | |  |  | | | | | | |  | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 056-98b-63 | | Incipient  vein | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | -0.24 | | | | | | | | 0.08 | | | | | | | | -0.49 | | | | | | | | | 0.09 | | | | -0.39 | | | | | | | | 0.13 | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 058-98b-62 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.19 | | | | | | | | 0.08 | | | | | | | | -0.22 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 084-98b-65 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.31 | | | | | | | | 0.08 | | | | | | | | -0.38 | | | | | | | | | 0.10 | | | |  | | | | | | | |  | | | | | | |  | | | 39.3 | | | | | | | | | 5.7 | | | | | | | | | | | 33.8 | | | | | | | | | |  | | | | | | 0.58 | | | | | | | | | | | | | | | |
| 062-98b-61 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.09 | | | | | | | | 0.09 | | | | | | | | -0.32 | | | | | | | | | 0.10 | | | |  | | | | | | | |  | | | | | | |  | | | 40.6 | | | | | | | | | 5.6 | | | | | | | | | | | 34.3 | | | | | | | | | |  | | | | | | 0.56 | | | | | | | | | | | | | | | |
| 064-98b-64 | |  | | | | |  | | | | | | | | 1 | | | | | | | | | | | -0.36 | | | | | | | | 0.08 | | | | | | | | -0.53 | | | | | | | | | 0.12 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.24** | | | | | | | | **0.11** | | | | | | | | **-0.39** | | | | | | | | | **0.13** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
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| 108-98b-76M6 | | Mesh | | | | | 2-a | | | | | | | | 2 | | | | | | | | | | | -0.08 | | | | | | | | 0.09 | | | | | | | | -0.18 | | | | | | | | | 0.13 | | | | -0.47 | | | | | | | | 0.17 | | | | | | |  | | | 39.7 | | | | | | | | | 5.3 | | | | | | | | | | | 35.2 | | | | | | | | | |  | | | | | | 0.61 | | | | | | | | | | | | | | | |
| 104-98b-76M7 | |  | | | | | 2-b | | | | | | | | 2 | | | | | | | | | | | -0.35 | | | | | | | | 0.09 | | | | | | | | -0.52 | | | | | | | | | 0.12 | | | |  | | | | | | | |  | | | | | | |  | | | 40.2 | | | | | | | | | 3.9 | | | | | | | | | | | 39.7 | | | | | | | | | |  | | | | | | 0.68 | | | | | | | | | | | | | | | |
| 106-98b76M7b | |  | | | | |  | | | | | | | | 2 | | | | | | | | | | | -0.29 | | | | | | | | 0.11 | | | | | | | | -0.57 | | | | | | | | | 0.13 | | | |  | | | | | | | |  | | | | | | |  | | | 38.9 | | | | | | | | | 3.6 | | | | | | | | | | | 38.5 | | | | | | | | | |  | | | | | | 0.69 | | | | | | | | | | | | | | | |
| 110-98b77M8a | |  | | | | | 2-c | | | | | | | | 2 | | | | | | | | | | | -0.23 | | | | | | | | 0.09 | | | | | | | | -0.46 | | | | | | | | | 0.11 | | | |  | | | | | | | |  | | | | | | |  | | | 40.7 | | | | | | | | | 5.6 | | | | | | | | | | | 34.9 | | | | | | | | | |  | | | | | | 0.58 | | | | | | | | | | | | | | | |
| 112-98b77M8b | |  | | | | |  | | | | | | | | 2 | | | | | | | | | | | -0.29 | | | | | | | | 0.09 | | | | | | | | -0.61 | | | | | | | | | 0.13 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.25** | | | | | | | | **0.10** | | | | | | | | **-0.47** | | | | | | | | | **0.17** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
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| 034-98b-55d | | Late  vein | | | | | 3.1-a | | | | | | | | 3.1 | | | | | | | | | | | -1.10 | | | | | | | | 0.07 | | | | | | | | -2.02 | | | | | | | | | 0.10 | | | | -1.94 | | | | | | | | 0.12 | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| *028-98b-55a* | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | *-0.58* | | | | | | | | *0.08* | | | | | | | | *-1.26* | | | | | | | | | *0.11* | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.84** | | | | | | | |  | | | | | | | | **-1.64** | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 018-98b-51 | | Late  vein | | | | | 3.1-b | | | | | | | | 3.1 | | | | | | | | | | | -0.98 | | | | | | | | 0.08 | | | | | | | | -1.96 | | | | | | | | | 0.11 | | | |  | | | | | | | |  | | | | | | |  | | | 38.8 | | | | | | | | | 3.4 | | | | | | | | | | | 40.5 | | | | | | | | | |  | | | | | | 0.73 | | | | | | | | | | | | | | | |
| 020-98b-52 | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | -1.02 | | | | | | | | 0.07 | | | | | | | | -1.94 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | | 38.6 | | | | | | | | | 3.1 | | | | | | | | | | | 40.6 | | | | | | | | | |  | | | | | | 0.74 | | | | | | | | | | | | | | | |
| 022-98b-53a | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | -0.93 | | | | | | | | 0.07 | | | | | | | | -1.85 | | | | | | | | | 0.10 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 024-98b-53b | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | -1.10 | | | | | | | | 0.07 | | | | | | | | -2.17 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 026-98b-54 | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | -1.04 | | | | | | | | 0.07 | | | | | | | | -1.97 | | | | | | | | | 0.09 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | **-1.02** | | | | | | | | **0.06** | | | | | | | | **-1.98** | | | | | | | | | **0.12** | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 074-98b-66 | | Late  vein | | | | | 3.1-c | | | | | | | | 3.1 | | | | | | | | | | | -0.90 | | | | | | | | 0.08 | | | | | | | | -1.84 | | | | | | | | | 0.10 | | | |  | | | | | | | |  | | | | | | |  | | | 38.3 | | | | | | | | | 3.2 | | | | | | | | | | | 40.6 | | | | | | | | | |  | | | | | | 0.74 | | | | | | | | | | | | | | | |
| 076-98b-67 | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | -1.01 | | | | | | | | 0.08 | | | | | | | | -1.93 | | | | | | | | | 0.10 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| *078-98b-69* | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | *-0.67* | | | | | | | | *0.08* | | | | | | | | *-1.43* | | | | | | | | | *0.10* | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| *080-98b-68* | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | *-0.47* | | | | | | | | *0.09* | | | | | | | | *-0.85* | | | | | | | | | *0.09* | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | **-0.95** | | | | | | | |  | | | | | | | | **-1.88** | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 082-98b-70 | | Late  vein | | | | | 3.1-d | | | | | | | | 3.1 | | | | | | | | | | | -0.90 | | | | | | | | 0.07 | | | | | | | | -1.68 | | | | | | | | | 0.11 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| 086-98b-71 | |  | | | | |  | | | | | | | | 3.1 | | | | | | | | | | | -1.08 | | | | | | | | 0.08 | | | | | | | | -2.02 | | | | | | | | | 0.10 | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | |  | | | | |  | | | | | | | |  | | | | | | | | | | | **-0.99** | | | | | | | |  | | | | | | | | **-1.85** | | | | | | | | |  | | | |  | | | | | | | |  | | | | | | |  | | |  | | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | |  | | | | | |  | | | | | | | | | | | | | | | |
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| 060-98b-60 | | | Late  vein | | | | | 3.2-a | | | | | | | | 3.2 | | | | | | | | | -0.14 | | | | | | | | 0.09 | | | | | | | | | | -0.34 | | | | | | | | | | 0.10 | | | -0.30 | | | | | | | | | | 0.12 | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| 050-98b-57 | | |  | | | | | 3.2-b | | | | | | | | 3.2 | | | | | | | | | -0.18 | | | | | | | | 0.08 | | | | | | | | | | -0.43 | | | | | | | | | | 0.12 | | |  | | | | | | | | | |  | | | | | | |  | 34.2 | | | | | | | | | | | | | 3.8 | | | | | | | | | | 40.6 | | | | | | | | | | | | |  | | | | | 0.82 | | | | | |
| 052-98b-58 | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | -0.19 | | | | | | | | 0.07 | | | | | | | | | | -0.32 | | | | | | | | | | 0.10 | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | **-0.19** | | | | | | | |  | | | | | | | | | | **-0.37** | | | | | | | | | |  | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| *030-98b-55b* | | | Late  vein | | | | | *3.2-c* | | | | | | | | 3.2 | | | | | | | | | *-0.35* | | | | | | | | *0.08* | | | | | | | | | | *-0.77* | | | | | | | | | | *0.09* | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| *036-98b-55e* | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | *-0.55* | | | | | | | | *0.09* | | | | | | | | | | *-0.98* | | | | | | | | | | *0.11* | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | **-0.45** | | | | | | | |  | | | | | | | | | | **-0.88** | | | | | | | | | |  | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| 088-98b-72 | | | Late  vein | | | | | 3.2-d | | | | | | | | 3.2 | | | | | | | | | -0.31 | | | | | | | | 0.07 | | | | | | | | | | -0.36 | | | | | | | | | | 0.11 | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| 090-98b-73 | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | -0.17 | | | | | | | | 0.08 | | | | | | | | | | -0.37 | | | | | | | | | | 0.11 | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| 092-98b-74 | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | 0.02 | | | | | | | | 0.09 | | | | | | | | | | -0.23 | | | | | | | | | | 0.11 | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| **Average ± 1SD** | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | | | **-0.15** | | | | | | | | **0.17** | | | | | | | | | | **-0.32** | | | | | | | | | | **0.08** | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
| 054-98b-59 | | | Late  vein | | | | | 3.2-e | | | | | | | | 3.2 | | | | | | | | | 0.02 | | | | | | | | 0.08 | | | | | | | | | | -0.06 | | | | | | | | | | 0.09 | | |  | | | | | | | | | |  | | | | | | |  |  | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | | | |  | | | | |  | | | | | | | | | | | | | | | |
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| **Asùt Tesoru (U1493B-9X-CC)** | | | | | | | | | | |  | |  | |  | | |  | | | | | | | | | | | | | | | |  | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | |  | | |  | | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | |  | | | | | | | | | | | | | | | | | | |
| 126-93-19M5b | | Mesh | | | | | 2-a | | | | | | | | 2 | | | | | | -0.33 | | | | | | | | 0.09 | | | | | | | | | -0.41 | | | | | | | | | 0.10 | | | | | | | | | | -0.41 | | | | | | | 0.10 | | | | | | |  | | | | | 40.3 | | | | | | | | | 6.7 | | | | | | | | | 34.7 | | | | | | | | | |  | | | | | | | 0.55 | | | | | | | | | | | | | | |
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| 018-93-17M3a | Veins in  bastite | | | | | 2-b | | | | | | | | 2 | | | | | | | | 0.15 | | | | | | | | 0.09 | | | | | | | | | 0.08 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | | | | |  | | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | | |  |  | | | | | | | | | | | | | |
| 020-93-17M3b |  | | | | |  | | | | | | | | 2 | | | | | | | | 0.03 | | | | | | | | 0.09 | | | | | | | | | 0.10 | | | | | | | | | 0.12 | | | | | | | | | |  | | | | | | |  | | | | | | | | | |  | | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | | |  |  | | | | | | | | | | | | | |
| 120-93-44Ma | Veins in  bastite | | | | | 2-c | | | | | | | | 2 | | | | | | | | -0.18 | | | | | | | | 0.08 | | | | | | | | | -0.61 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | | | | |  | | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | | |  |  | | | | | | | | | | | | | |
| 122-93-44Mb |  | | | | |  | | | | | | | | 2 | | | | | | | | -0.03 | | | | | | | | 0.07 | | | | | | | | | -0.07 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | | | | |  | | | | | | | | |  | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | | | |  |  | | | | | | | | | | | | | |
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| 024-93-20a | Late  vein | | | | | 3.1-a | | | | | | | | 3.1 | | | | | | | | -0.35 | | | | | | | | 0.08 | | | | | | | | | -0.73 | | | | | | | | | 0.11 | | | | | | | | | | -0.93 | | | | | | | 0.21 | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 026-93-20b |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.41 | | | | | | | | 0.08 | | | | | | | | | -0.63 | | | | | | | | | 0.12 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | | 39.5 | | | | | | | | | 4.7 | | | | | | | | | 41.8 | | | | | | | | | |  | | | | | | | 0.71 | | | | | | | | | |
| 022-93-187M3 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.37 | | | | | | | | 0.09 | | | | | | | | | -0.86 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.38** | | | | | | | | **0.03** | | | | | | | | | **-0.74** | | | | | | | | | **0.12** | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 030-93-22 | Late  vein | | | | | 3.1-b | | | | | | | | 3.1 | | | | | | | | -0.30 | | | | | | | | 0.12 | | | | | | | | | -0.73 | | | | | | | | | 0.15 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 034-93-23a |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.43 | | | | | | | | 0.10 | | | | | | | | | -0.89 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 036-93-23b |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.28 | | | | | | | | 0.10 | | | | | | | | | -0.68 | | | | | | | | | 0.14 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.34** | | | | | | | | **0.08** | | | | | | | | | **-0.77** | | | | | | | | | **0.11** | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 048-93-50 | Late  vein | | | | | 3.1-c | | | | | | | | 3.1 | | | | | | | | -0.48 | | | | | | | | 0.08 | | | | | | | | | -0.93 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 050-93-49 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.53 | | | | | | | | 0.07 | | | | | | | | | -1.09 | | | | | | | | | 0.09 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.51** | | | | | | | |  | | | | | | | | | **-1.01** | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 054-93-25 | Late  vein | | | | | 3.1-d | | | | | | | | 3.1 | | | | | | | | -0.32 | | | | | | | | 0.08 | | | | | | | | | -0.71 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | | 39.3 | | | | | | | | | 4.8 | | | | | | | | | 42.0 | | | | | | | | | |  | | | | | | | 0.72 | | | | | | | | | |
| 056-93-26 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.55 | | | | | | | | 0.08 | | | | | | | | | -1.19 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 058-93-27 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.55 | | | | | | | | 0.07 | | | | | | | | | -1.12 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 110-93-29 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.42 | | | | | | | | 0.07 | | | | | | | | | -0.73 | | | | | | | | | 0.09 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 112-93-30 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.57 | | | | | | | | 0.08 | | | | | | | | | -1.23 | | | | | | | | | 0.09 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | | 38.9 | | | | | | | | | 5.2 | | | | | | | | | 42.0 | | | | | | | | | |  | | | | | | | 0.71 | | | | | | | | | |
| 114-93-31 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.43 | | | | | | | | 0.08 | | | | | | | | | -0.83 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.47** | | | | | | | | **0.10** | | | | | | | | | **-0.97** | | | | | | | | | **0.24** | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 092-93-35 | Late  vein | | | | | 3.1-e | | | | | | | | 3.1 | | | | | | | | -0.58 | | | | | | | | 0.08 | | | | | | | | | -1.19 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 104-93-36 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.65 | | | | | | | | 0.07 | | | | | | | | | -1.30 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 106-93-37 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.54 | | | | | | | | 0.08 | | | | | | | | | -1.05 | | | | | | | | | 0.09 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.59** | | | | | | | | **0.06** | | | | | | | | | **-1.18** | | | | | | | | | **0.13** | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
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| 078-93-42 | Late  vein | | | | | 3.1-f | | | | | | | | 3.1 | | | | | | | | 0.14 | | | | | | | | 0.08 | | | | | | | | | 0.25 | | | | | | | | | 0.12 | | | | | | | | | | 0.27 | | | | | | | 0.11 | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 128-93-41bis |  | | | | |  | | | | | | | | 3.1 | | | | | | | | 0.04 | | | | | | | | 0.08 | | | | | | | | | 0.18 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **0.09** | | | | | | | |  | | | | | | | | | **0.21** | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 118-93-44 | Late  vein | | | | | 3.1-g | | | | | | | | 3.1 | | | | | | | | 0.31 | | | | | | | | 0.07 | | | | | | | | | 0.39 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
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| 052-93-48 | Late  vein | | | | | 3.1-a | | | | | | | | 3.1 | | | | | | | | -0.22 | | | | | | | | 0.10 | | | | | | | | | -0.69 | | | | | | | | | 0.13 | | | | | | | | | | -0.80 | | | | | | | 0.22 | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
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| 076-93-45 | Late  vein | | | | | 3.1-b | | | | | | | | 3.1 | | | | | | | | -0.57 | | | | | | | | 0.10 | | | | | | | | | -1.11 | | | | | | | | | 0.15 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | | 38.8 | | | | | | | | | 4.8 | | | | | | | | | 41.8 | | | | | | | | | |  | | | | | | | 0.72 | | | | | | | | | |
| 066-93-46 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.45 | | | | | | | | 0.08 | | | | | | | | | -0.86 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 064-93-47 |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.43 | | | | | | | | 0.11 | | | | | | | | | -0.93 | | | | | | | | | 0.14 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.49** | | | | | | | | **0.08** | | | | | | | | | **-0.97** | | | | | | | | | **0.13** | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
| 082-93-40 | Late  vein | | | | | 3.1-c | | | | | | | | 3.1 | | | | | | | | -0.48 | | | | | | | | 0.09 | | | | | | | | | -0.93 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | | 38.8 | | | | | | | | | 5.0 | | | | | | | | | 41.8 | | | | | | | | | |  | | | | | | | 0.71 | | | | | | | | | |
| *084-93-41* |  | | | | |  | | | | | | | | *3.1* | | | | | | | | *-0.12* | | | | | | | | *0.12* | | | | | | | | | *-0.01* | | | | | | | | | *0.16* | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
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| 090-93-38 | Late  vein | | | | | 3.1-d | | | | | | | | 3.1 | | | | | | | | -0.24 | | | | | | | | 0.12 | | | | | | | | | -0.60 | | | | | | | | | 0.18 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
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| 094-93-39 | Late  vein | | | | | 3.1-e | | | | | | | | 3.1 | | | | | | | | -0.44 | | | | | | | | 0.15 | | | | | | | | | -0.63 | | | | | | | | | 0.24 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
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| 108-93-32 | Late  vein | | | | | 3.1-f | | | | | | | | 3.1 | | | | | | | | -0.03 | | | | | | | | 0.17 | | | | | | | | | -0.32 | | | | | | | | | 0.17 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
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| 116-93-33 | Late  vein | | | | | 3.1-g | | | | | | | | 3.1 | | | | | | | | -0.40 | | | | | | | | 0.09 | | | | | | | | | -0.91 | | | | | | | | | 0.11 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | |
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| 080-93-43 | Late  vein | | | | | 3.1-h | | | | | | | | 3.1 | | | | | | | | -0.35 | | | | | | | | 0.09 | | | | | | | | | -0.91 | | | | | | | | | 0.12 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | | 38.8 | | | | | | | | | 4.9 | | | | | | | | | 41.6 | | | | | | | | | |  | | | | | | | 0.72 | | | | | | | | | |
| 130-93-44bis |  | | | | |  | | | | | | | | 3.1 | | | | | | | | -0.48 | | | | | | | | 0.09 | | | | | | | | | -0.89 | | | | | | | | | 0.10 | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| **Average ± 1SD** |  | | | | |  | | | | | | | |  | | | | | | | | **-0.41** | | | | | | | |  | | | | | | | | | **-0.90** | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
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| 028-93-21 | Late  vein | | | | | 3.2 | | | | | | | | 3.2 | | | | | | | | 0.25 | | | | | | | | 0.14 | | | | | | | | | 0.41 | | | | | | | | | 0.17 | | | | | | | | | | 0.22 | | | | | | | 0.19 | | | | | | |  | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | |  | | | | | | | | | | | | | | | | |
| 038-93-23c | | | |  | | | | |  | | | | | 3.2 | | | | | | | | | 0.10 | | | | | | | | 0.13 | | | | | | | | | 0.19 | | | | | | | | | | 0.16 | | | | | | | | |  | | | | | | | |  | | | | | | | | | | | |  | | | | | | | | |  | | | | | | | |  | | | | | | | | | | |  | | | | | | | | | | |  | | | | |  | | | | | | | |
| 032-93-24 | | | |  | | | | |  | | | | | | | | 3.2 | | | | | | | -0.05 | | | | | | | | 0.12 | | | | | | | | | 0.04 | | | | | | | | | | | 0.19 | | | | | | | | |  | | | | | | |  | | | | | | | | | | | |  | | | | | | | | |  | | | | | | | | |  | | | | | | | | | |  | | | | | | | | | | |  | | | | |  | | | | | |
| **Average ± 1SD** | | | | |  | | | | |  | |  | | | | | | | | **0.10** | | | | | | | | **0.15** | | | | | | | | | **0.22** | | | | | | | | | | | | **0.19** | | | | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | |  | | | | | | | | | | | | |  | | | | | | |  | | | | | | |  | | | |
| values in italics are excluded from average calculations due to mixture analyses with surrounding material | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | |  | | | | | | | | | | | | |  |  | | |

1. Supplementary figures

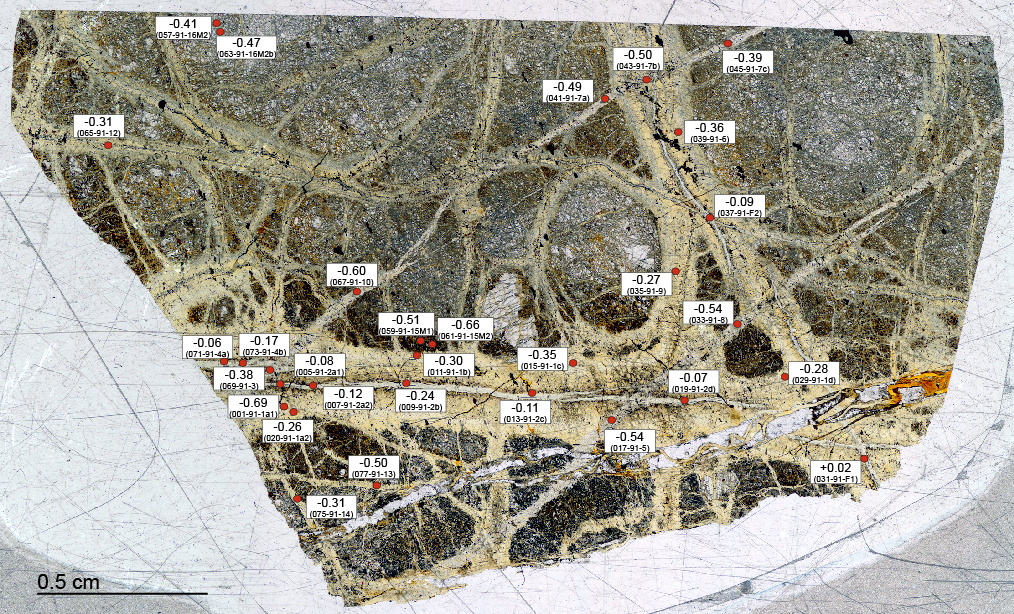


Figure A.1: In situ δ30Si values and IDs of individual analyses for Yinazao (see also Table A.6).

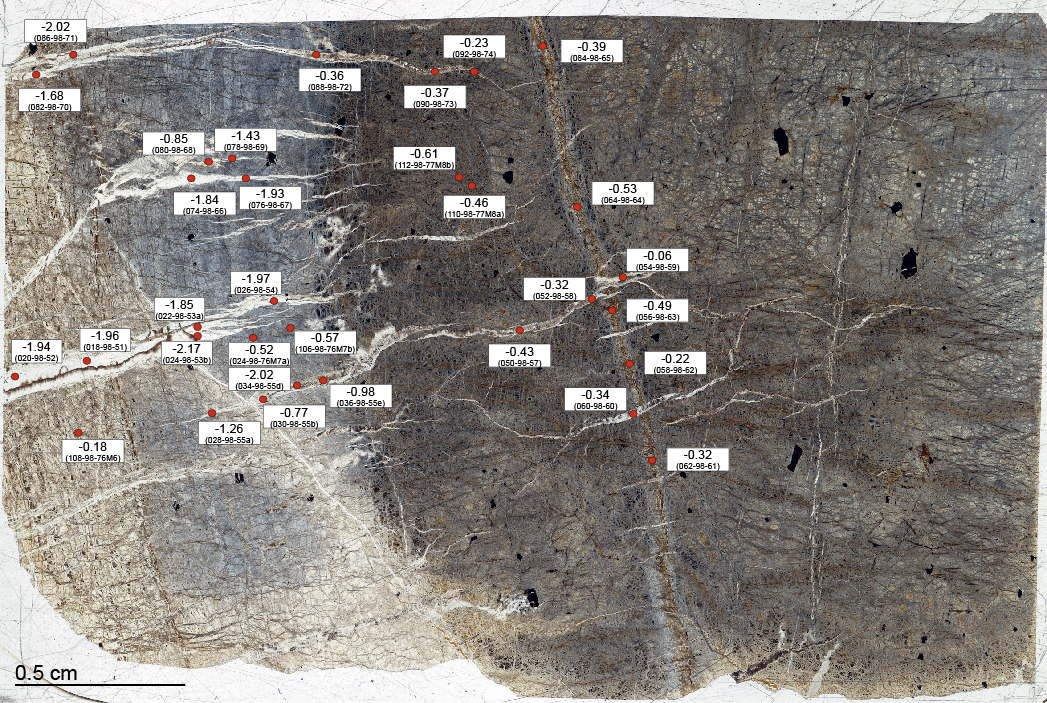


Figure A.2: In situ δ30Si values and IDs of individual analyses for Fantangisña (see also Table A.6)

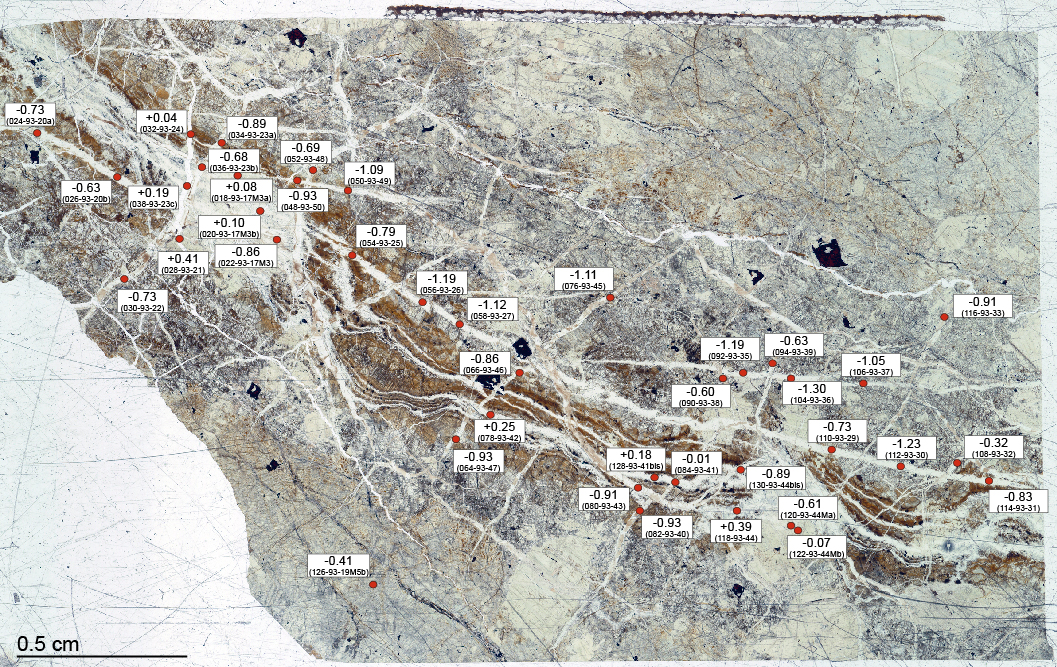


Figure A.3: In situ δ30Si values and IDs of individual analyses for Asùt Tesoru (see also Table A.6)

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