

1 ***In-situ* determination of antimony isotope ratios in Sb-rich**
2 **minerals by femtosecond LA-MC-ICP-MS**

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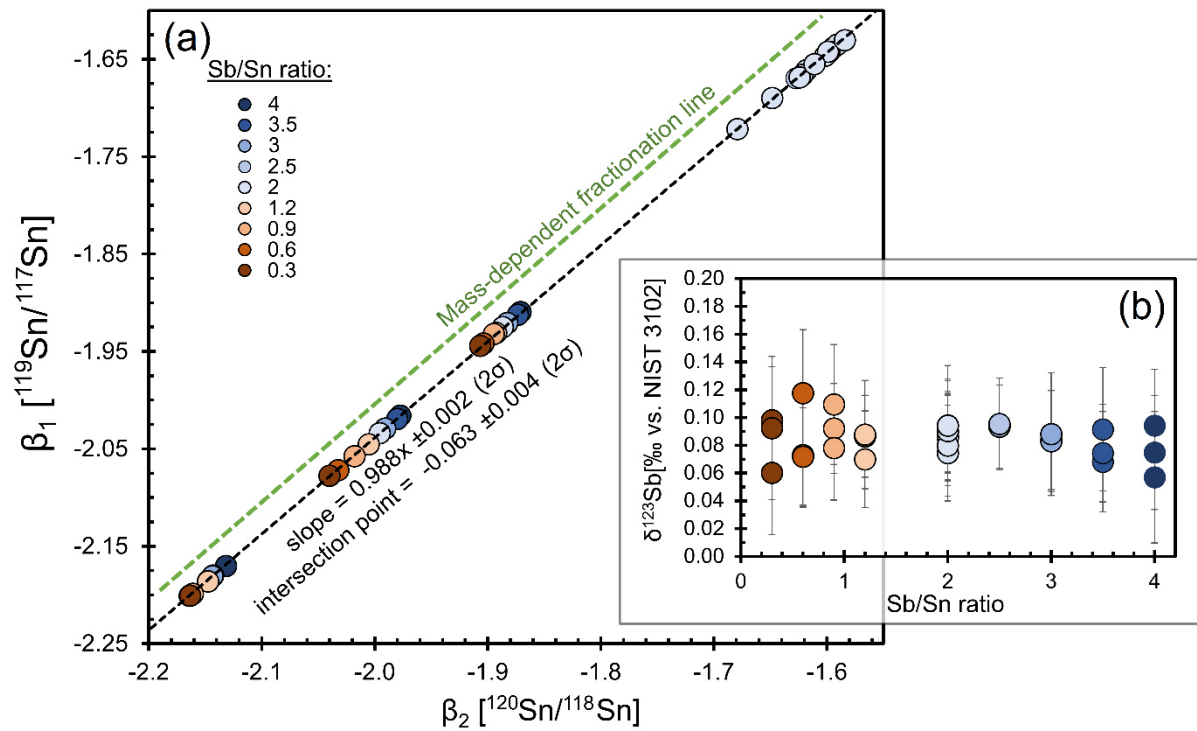
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12 Appendix A. Supplementary information

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29 **Spike calibration**

30 In this study, both the ratio of $^{119}\text{Sn}/^{117}\text{Sn}$, which is interference free, as well as $^{120}\text{Sn}/^{118}\text{Sn}$ were used
 31 for mass bias correction ratios (in order to check internal consistency of the method). As the Sb
 32 content of the samples may be purely known, different Sb/Sn ratios were tested for consistency.
 33 Figures S1a and S1b illustrates the relationship between $\beta_{119/117}$ and $\beta_{120/118}$ for a range of β values
 34 (variable mass bias) and different Sb/Sn ratios on the Sb isotope composition. No mass bias drift in
 35 figure S1a at Sb/Sn ratios between 0.3 and 4 could be recognized. This implies, that using both $\beta_{119/117}$
 36 and $\beta_{120/118}$ for instrumental mass bias correction during laser ablation Sb isotope measurements
 37 with constant Sn and variable Sb contents between different materials provides reliable and robust
 38 results.



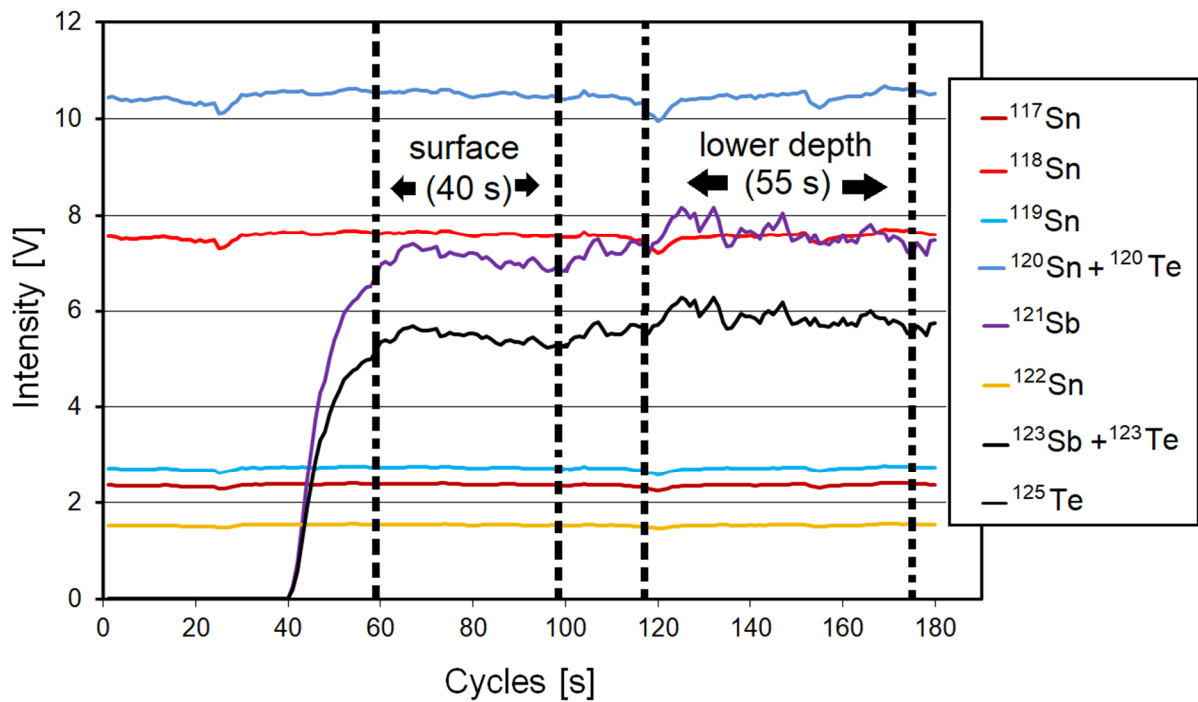
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 40 Fig. S1. Comparison between β_1 versus β_2 (a) and $\delta^{123}\text{Sb}$ relative to NIST SRM 3102a versus Sb/Sn ratios
 41 (b), respectively, obtained by mixing experiments with solution nebulisation MC-ICP-MS. Error bars
 42 (2σ) smaller than the symbol size are not shown in figure (a). The theoretical mass dependent
 43 fractionation line is coloured in green. The result of the classical x-y regression method after Ludwig
 44 (2003)¹ is shown in figure (a). Error bars of δ values represent 2σ (error-propagated internal
 45 uncertainties (2 SE) of the sample and standard measurements).

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49 **Antimony oxide (senarmontite)**



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51 Fig. S2. Laser ablation time resolved intensities for line analyses of one senarmontite grain. Note that
52 the signal intensities of senarmontite is marked by a strong increase of the intensity and changes of
53 the $\delta^{123}\text{Sb}$ value after the first 40 s of analysis. Details will be discussed in the text.

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60 **References**

61 (1) K. R. Ludwig, User's manual for isoplot 3.00, a geochronological toolkit for microsoft excel. *Berkeley*
62 *Geochronl. Cent. Spec. Publ.*, 2003, 4, 25–32.

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Table S1

	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
slow cooled (SC) stibnite:								
SC1-untreated-1	-0.215	0.015	-0.215	0.015	-0.175	0.028	-0.191	0.019
SC1-untreated-2	-0.254	0.016	-0.254	0.016	-0.194	0.027	-0.199	0.018
SC1-untreated-3	-0.097	0.038	-0.097	0.038	-0.186	0.026	-0.181	0.018
SC2-untreated-1	-0.270	0.016	-0.270	0.016	-0.200	0.026	-0.198	0.018
SC2-untreated-2	-0.188	0.016	-0.188	0.016	-0.188	0.026	-0.189	0.016
SC2-untreated-3	-0.188	0.017	-0.188	0.017	-0.195	0.026	-0.203	0.016
SC2-purified-1	-0.094	0.016	-0.094	0.016	-0.184	0.028	-0.185	0.018
SC2-purified-2	-0.167	0.021	-0.167	0.021	-0.163	0.040	-0.160	0.026
SC3-untreated-1	-0.159	0.017	-0.159	0.017	-0.199	0.026	-0.200	0.016
SC3-untreated-2	-0.177	0.015	-0.177	0.015	-0.187	0.025	-0.191	0.016
SC3-untreated-3	-0.162	0.015	-0.162	0.015	-0.178	0.023	-0.193	0.015
SC3-purified-1	-0.144	0.020	-0.144	0.020	-0.178	0.034	-0.204	0.021
SC3-purified-2	-0.196	0.020	-0.196	0.020	-0.214	0.035	-0.203	0.025
SC3-purified-3	-0.282	0.020	-0.282	0.020	-0.223	0.041	-0.203	0.027
SC4-untreated-1	-0.192	0.015	-0.192	0.015	-0.178	0.024	-0.178	0.019
SC4-untreated-2	-0.176	0.015	-0.176	0.015	-0.207	0.025	-0.185	0.016
SC4-untreated-3	-0.187	0.016	-0.187	0.016	-0.163	0.024	-0.192	0.016
SC4-purified-1	-0.090	0.015	-0.090	0.015	-0.181	0.027	-0.168	0.018
SC4-purified-2	-0.117	0.018	-0.117	0.018	-0.184	0.039	-0.179	0.025
SC4-purified-3	-0.141	0.021	-0.141	0.021	-0.199	0.037	-0.199	0.023
quenched (Q) stibnite:								
Q1-untreated-1	-0.214	0.021	-0.214	0.021	-0.158	0.028	-0.152	0.020
Q1-untreated-2	-0.255	0.028	-0.255	0.028	-0.177	0.025	-0.157	0.020
Q1-untreated-3	-0.233	0.023	-0.233	0.023	-0.141	0.027	-0.157	0.017
Q2-untreated-1	-0.203	0.013	-0.203	0.013	-0.211	0.024	-0.197	0.016
Q2-untreated-2	-0.230	0.015	-0.230	0.015	-0.205	0.024	-0.208	0.016
Q2-untreated-3	-0.252	0.016	-0.252	0.016	-0.209	0.025	-0.209	0.016
Q2-purified-1	-0.164	0.015	-0.164	0.015	-0.188	0.027	-0.195	0.019
Q2-purified-2	-0.226	0.021	-0.226	0.021	-0.181	0.036	-0.182	0.026
Q2-purified-3	-0.115	0.019	-0.115	0.019	-0.173	0.039	-0.213	0.039
Q3-untreated-1	-0.205	0.014	-0.205	0.014	-0.207	0.025	-0.199	0.016
Q3-untreated-2	-0.205	0.015	-0.205	0.015	-0.201	0.024	-0.209	0.019
Q3-untreated-3	-0.226	0.016	-0.226	0.016	-0.206	0.025	-0.205	0.015
Q4-untreated-1	-0.226	0.015	-0.226	0.015	-0.206	0.025	-0.211	0.018
Q4-untreated-2	-0.232	0.016	-0.232	0.016	-0.190	0.025	-0.206	0.019
Q4-untreated-3	-0.228	0.017	-0.228	0.017	-0.203	0.025	-0.202	0.017
Q4-purified-1	-0.183	0.016	-0.183	0.016	-0.197	0.029	-0.200	0.020
Q4-purified-2	-0.178	0.021	-0.178	0.021	-0.193	0.038	-0.193	0.027
Q4-purified-3	-0.145	0.021	-0.145	0.021	-0.191	0.039	-0.215	0.039
MET:								
MET1-untreated-1	0.255	0.015	0.255	0.015	0.219	0.027	0.218	0.019
MET1-untreated-2	0.204	0.015	0.204	0.015	0.218	0.026	0.211	0.016
MET1-untreated-3	0.225	0.015	0.225	0.015	0.206	0.024	0.202	0.018
MET1-purified-1	0.180	0.016	0.180	0.016	0.195	0.031	0.181	0.021
MET1-purified-2	0.255	0.018	0.255	0.018	0.185	0.038	0.203	0.025
MET1-purified-3	0.230	0.019	0.230	0.019	0.183	0.039	0.187	0.028
MET2-untreated-1	0.202	0.016	0.202	0.016	0.231	0.027	0.214	0.018
MET2-untreated-2	0.205	0.014	0.206	0.014	0.209	0.026	0.208	0.017
MET2-untreated-3	0.205	0.016	0.205	0.016	0.219	0.025	0.225	0.018
MET2-purified-2	0.335	0.018	0.334	0.018	0.201	0.038	0.207	0.025
MET2-purified-3	0.252	0.019	0.252	0.019	0.211	0.039	0.196	0.027
MET3-untreated-1	0.219	0.016	0.220	0.016	0.196	0.027	0.202	0.018
MET3-untreated-2	0.230	0.014	0.230	0.014	0.200	0.023	0.214	0.016
MET3-untreated-3	0.203	0.015	0.203	0.015	0.169	0.025	0.161	0.020
MET4-untreated-1	0.126	0.025	0.127	0.025	0.138	0.030	0.149	0.027
MET4-untreated-2	0.178	0.024	0.178	0.024	0.156	0.030	0.153	0.024
MET4-untreated-3	0.145	0.025	0.147	0.025	0.128	0.031	0.121	0.027

Table S1

	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
MAC:								
MAC11-untreated-1	0.625	0.015	0.625	0.015	0.634	0.027	0.634	0.017
MAC11-untreated-2	0.635	0.018	0.635	0.018	0.641	0.026	0.641	0.017
MAC11-untreated-3	0.631	0.018	0.632	0.018	0.635	0.027	0.616	0.017
MAC11-purified-1	0.637	0.014	0.637	0.014	0.639	0.029	0.632	0.019
MAC11-purified-2	0.634	0.020	0.634	0.020	0.665	0.037	0.655	0.027
MAC11-purified-3	0.753	0.022	0.753	0.022	0.672	0.040	0.636	0.042
MAC12-untreated-1	0.651	0.016	0.651	0.016	0.655	0.027	0.638	0.014
MAC12-untreated-2	0.654	0.017	0.654	0.017	0.650	0.028	0.650	0.020
MAC12-untreated-3	0.658	0.017	0.658	0.017	0.652	0.024	0.651	0.017
MAC21-untreated-1	0.657	0.017	0.657	0.017	0.642	0.026	0.633	0.016
MAC21-untreated-2	0.666	0.017	0.666	0.017	0.614	0.027	0.631	0.019
MAC21-untreated-3	0.657	0.017	0.657	0.017	0.635	0.023	0.635	0.018
MAC21-purified-1	0.694	0.016	0.694	0.016	0.639	0.031	0.630	0.019
MAC21-purified-2	0.681	0.021	0.681	0.021	0.666	0.038	0.655	0.027
MAC21-purified-3	0.716	0.021	0.716	0.021	0.658	0.042	0.638	0.041
MAC22-untreated-1	0.660	0.017	0.660	0.017	0.635	0.026	0.644	0.018
MAC22-untreated-2	0.661	0.017	0.661	0.017	0.637	0.025	0.643	0.018
MAC22-untreated-3	0.634	0.017	0.634	0.017	0.647	0.025	0.669	0.018

Table S2

	relative to SC (for MAC and MET) and relative to MAC (for SC)								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
SC_LA MC-ICP-MS_01	-0.895	0.019	-0.895	0.020	-0.880	0.028	-0.875	0.036					-0.235	0.028	-0.234	0.036
SC_LA MC-ICP-MS_02	-0.846	0.021	-0.846	0.021	-0.874	0.029	-0.869	0.036					-0.229	0.029	-0.228	0.036
SC_LA MC-ICP-MS_03	-0.785	0.017	-0.785	0.017	-0.821	0.029	-0.829	0.037					-0.176	0.029	-0.188	0.037
SC_LA MC-ICP-MS_04	-0.898	0.016	-0.898	0.016	-0.838	0.028	-0.841	0.036					-0.193	0.028	-0.200	0.036
SC_LA MC-ICP-MS_05	-0.913	0.016	-0.913	0.016	-0.842	0.028	-0.836	0.036					-0.197	0.028	-0.195	0.036
SC_LA MC-ICP-MS_06	-1.042	0.019	-1.042	0.019	-0.901	0.029	-0.893	0.040					-0.256	0.029	-0.252	0.040
SC_LA MC-ICP-MS_07	-0.824	0.018	-0.824	0.018	-0.905	0.027	-0.924	0.043					-0.260	0.027	-0.283	0.043
SC_LA MC-ICP-MS_08	-0.931	0.017	-0.931	0.017	-0.804	0.027	-0.805	0.044					-0.159	0.027	-0.164	0.044
SC_LA MC-ICP-MS_09	-0.794	0.021	-0.794	0.021	-0.890	0.030	-0.878	0.044					-0.245	0.030	-0.237	0.044
SC_LA MC-ICP-MS_10	-0.925	0.020	-0.925	0.020	-0.914	0.029	-0.909	0.040					-0.269	0.029	-0.268	0.040
SC_LA MC-ICP-MS_11	-0.862	0.021	-0.862	0.021	-0.900	0.030	-0.898	0.044					-0.255	0.030	-0.257	0.044
SC_LA MC-ICP-MS_12	-0.780	0.017	-0.779	0.017	-0.836	0.027	-0.844	0.036					-0.191	0.027	-0.203	0.036
SC_LA MC-ICP-MS_13	-0.888	0.025	-0.888	0.025	-0.872	0.042	-0.879	0.032					-0.227	0.042	-0.238	0.032
SC_LA MC-ICP-MS_14	-0.999	0.028	-0.999	0.028	-0.860	0.044	-0.846	0.034					-0.215	0.044	-0.205	0.034
SC_LA MC-ICP-MS_15	-1.004	0.027	-1.004	0.027	-0.909	0.042	-0.901	0.033					-0.264	0.042	-0.260	0.033
SC_LA MC-ICP-MS_16	-0.726	0.027	-0.726	0.027	-0.871	0.044	-0.859	0.033					-0.226	0.044	-0.218	0.033
SC_LA MC-ICP-MS_17	-0.842	0.025	-0.842	0.025	-0.818	0.044	-0.800	0.033					-0.173	0.044	-0.159	0.033
SC_LA MC-ICP-MS_18	-0.805	0.025	-0.806	0.025	-0.819	0.044	-0.817	0.033					-0.174	0.044	-0.176	0.033
SC_LA MC-ICP-MS_19	-1.015	0.025	-1.016	0.024	-0.881	0.036	-0.878	0.030					-0.236	0.036	-0.237	0.030
SC_LA MC-ICP-MS_20	-0.759	0.023	-0.758	0.023	-0.806	0.037	-0.826	0.029					-0.161	0.037	-0.185	0.029
SC_LA MC-ICP-MS_21	-0.954	0.061	-0.937	0.025	-0.831	0.037	-0.844	0.031					-0.186	0.037	-0.203	0.031
SC_LA MC-ICP-MS_22	-0.720	0.061	-0.705	0.025	-0.818	0.037	-0.814	0.031					-0.173	0.037	-0.173	0.031
SC_LA MC-ICP-MS_23	-0.708	0.061	-0.694	0.025	-0.830	0.038	-0.836	0.031					-0.185	0.038	-0.195	0.031
SC_LA MC-ICP-MS_24	-0.730	0.083	-0.706	0.028	-0.848	0.039	-0.855	0.032					-0.203	0.039	-0.214	0.032
SC_LA MC-ICP-MS_25	-0.882	0.082	-0.851	0.022	-0.844	0.035	-0.852	0.027					-0.199	0.035	-0.211	0.027
SC_LA MC-ICP-MS_26	-0.837	0.025	-0.837	0.025	-0.802	0.036	-0.801	0.024					-0.157	0.036	-0.160	0.024
SC_LA MC-ICP-MS_27	-0.788	0.025	-0.789	0.025	-0.824	0.034	-0.811	0.026					-0.179	0.034	-0.170	0.026
SC_LA MC-ICP-MS_28	-0.905	0.027	-0.906	0.027	-0.830	0.035	-0.827	0.026					-0.185	0.035	-0.186	0.026
SC_LA MC-ICP-MS_29	-0.781	0.028	-0.780	0.028	-0.830	0.035	-0.813	0.027					-0.185	0.035	-0.172	0.027
SC_LA MC-ICP-MS_30	-0.877	0.031	-0.876	0.030	-0.810	0.035	-0.806	0.030					-0.165	0.035	-0.165	0.030
SC_LA MC-ICP-MS_31	-0.834	0.029	-0.834	0.029	-0.789	0.035	-0.793	0.028					-0.144	0.035	-0.152	0.028
SC_LA MC-ICP-MS_32	-0.777	0.028	-0.777	0.028	-0.815	0.035	-0.815	0.026					-0.170	0.035	-0.174	0.026
SC_LA MC-ICP-MS_33	-0.780	0.025	-0.780	0.025	-0.809	0.034	-0.800	0.026					-0.164	0.034	-0.159	0.026
SC_LA MC-ICP-MS_34	-0.937	0.024	-0.935	0.024	-0.814	0.033	-0.826	0.027					-0.169	0.033	-0.185	0.027
SC_LA MC-ICP-MS_35	-1.051	0.022	-1.050	0.022	-0.900	0.032	-0.895	0.026					-0.255	0.032	-0.254	0.026
SC_LA MC-ICP-MS_36	-0.948	0.023	-0.942	0.023	-0.885	0.032	-0.899	0.026					-0.240	0.032	-0.258	0.026
SC_LA MC-ICP-MS_37	-0.843	0.021	-0.841	0.021	-0.846	0.032	-0.847	0.026					-0.201	0.032	-0.206	0.026
SC_LA MC-ICP-MS_38	-0.866	0.025	-0.865	0.024	-0.858	0.032	-0.831	0.027					-0.213	0.032	-0.190	0.027
SC_LA MC-ICP-MS_39	-0.832	0.029	-0.838	0.028	-0.856	0.037	-0.844	0.032					-0.211	0.037	-0.203	0.032
SC_LA MC-ICP-MS_40	-0.918	0.029	-0.919	0.028	-0.885	0.038	-0.870	0.032					-0.240	0.038	-0.229	0.032
SC_LA MC-ICP-MS_41	-0.837	0.029	-0.840	0.027	-0.822	0.038	-0.816	0.032					-0.177	0.038	-0.175	0.032
SC_LA MC-ICP-MS_42	-0.805	0.030	-0.806	0.028	-0.810	0.035	-0.812	0.032					-0.165	0.035	-0.171	0.032
SC_LA MC-ICP-MS_43	-0.773	0.029	-0.775	0.028	-0.793	0.035	-0.809	0.033					-0.148	0.035	-0.168	0.033
SC_LA MC-ICP-MS_44	-0.808	0.026	-0.810	0.026	-0.783	0.034	-0.809	0.030					-0.138	0.034	-0.168	0.030
SC_LA MC-ICP-MS_45	-0.638	0.027	-0.639	0.027	-0.785	0.033	-0.794	0.032					-0.140	0.033	-0.153	0.032
SC_LA MC-ICP-MS_46	-0.846	0.027	-0.848	0.026	-0.773	0.035	-0.775	0.033					-0.128	0.035	-0.134	0.033

Table S2

	relative to SC (for MAC and MET) and relative to MAC (for SC)								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
SC_LA MC-ICP-MS_47	-0.875	0.028	-0.878	0.027	-0.788	0.035	-0.788	0.034					-0.143	0.035	-0.147	0.034
SC_LA MC-ICP-MS_48	-0.703	0.028	-0.708	0.026	-0.805	0.038	-0.809	0.035					-0.160	0.038	-0.168	0.035
SC_LA MC-ICP-MS_49	-0.932	0.028	-0.937	0.027	-0.790	0.038	-0.806	0.036					-0.145	0.038	-0.165	0.036
SC_LA MC-ICP-MS_50	-0.722	0.031	-0.722	0.029	-0.799	0.045	-0.784	0.037					-0.154	0.045	-0.143	0.037
SC_LA MC-ICP-MS_51	-0.730	0.031	-0.741	0.033	-0.744	0.041	-0.813	0.038					-0.099	0.041	-0.172	0.038
SC_LA MC-ICP-MS_52	-0.746	0.038	-0.750	0.038	-0.796	0.036	-0.815	0.031					-0.151	0.036	-0.174	0.031
SC_LA MC-ICP-MS_53	-0.965	0.042	-0.970	0.042	-0.841	0.036	-0.846	0.031					-0.196	0.036	-0.205	0.031
SC_LA MC-ICP-MS_54	-0.954	0.030	-0.952	0.030	-0.847	0.035	-0.840	0.031					-0.202	0.035	-0.199	0.031
SC_LA MC-ICP-MS_55	-0.850	0.030	-0.849	0.030	-0.826	0.034	-0.813	0.034					-0.181	0.034	-0.172	0.034
SC_LA MC-ICP-MS_56	-0.809	0.033	-0.813	0.032	-0.798	0.037	-0.804	0.034					-0.153	0.037	-0.163	0.034
SC_LA MC-ICP-MS_57	-0.674	0.030	-0.678	0.029	-0.789	0.036	-0.809	0.034					-0.144	0.036	-0.168	0.034
SC_LA MC-ICP-MS_58	-0.948	0.034	-0.948	0.033	-0.850	0.038	-0.852	0.033					-0.205	0.038	-0.211	0.033
SC_LA MC-ICP-MS_59	-0.932	0.033	-0.933	0.032	-0.876	0.037	-0.850	0.035					-0.231	0.037	-0.209	0.035
SC_LA MC-ICP-MS_60	-0.748	0.033	-0.751	0.032	-0.851	0.038	-0.836	0.035					-0.206	0.038	-0.195	0.035
SC_LA MC-ICP-MS_61	-0.834	0.031	-0.834	0.030	-0.833	0.037	-0.837	0.033					-0.188	0.037	-0.196	0.033
SC_LA MC-ICP-MS_62	-0.783	0.029	-0.783	0.027	-0.823	0.037	-0.821	0.032					-0.178	0.037	-0.180	0.032
SC_LA MC-ICP-MS_63	-0.941	0.028	-0.947	0.030	-0.828	0.038	-0.825	0.034					-0.183	0.038	-0.184	0.034
SC_LA MC-ICP-MS_64	-0.660	0.030	-0.658	0.032	-0.819	0.039	-0.778	0.036					-0.174	0.039	-0.137	0.036
SC_LA MC-ICP-MS_65	-0.818	0.028	-0.822	0.030	-0.793	0.038	-0.800	0.033					-0.148	0.038	-0.159	0.033
SC_LA MC-ICP-MS_66	-0.667	0.028	-0.668	0.030	-0.808	0.037	-0.793	0.034					-0.163	0.037	-0.152	0.034
SC_LA MC-ICP-MS_67	-0.664	0.030	-0.669	0.031	-0.819	0.040	-0.801	0.035					-0.174	0.040	-0.160	0.035
SC_LA MC-ICP-MS_68	-0.795	0.029	-0.798	0.031	-0.831	0.039	-0.814	0.034					-0.186	0.039	-0.173	0.034
SC_LA MC-ICP-MS_69	-0.813	0.030	-0.818	0.031	-0.818	0.039	-0.831	0.035					-0.173	0.039	-0.190	0.035
SC_LA MC-ICP-MS_70	-0.811	0.028	-0.808	0.027	-0.804	0.038	-0.791	0.034					-0.159	0.038	-0.150	0.034
SC_LA MC-ICP-MS_71	-0.840	0.029	-0.835	0.029	-0.801	0.038	-0.817	0.034					-0.156	0.038	-0.176	0.034
SC_LA MC-ICP-MS_72	-0.639	0.029	-0.633	0.029	-0.809	0.041	-0.803	0.034					-0.164	0.041	-0.162	0.034
SC_LA MC-ICP-MS_73	-0.829	0.056	-0.859	0.052	-0.861	0.038	-0.844	0.033					-0.216	0.038	-0.203	0.033
SC_LA MC-ICP-MS_74	-0.842	0.029	-0.840	0.029	-0.844	0.037	-0.851	0.033					-0.199	0.037	-0.210	0.033
SC_LA MC-ICP-MS_75	-0.666	0.029	-0.660	0.029	-0.825	0.037	-0.820	0.034					-0.180	0.037	-0.179	0.034
SC_LA MC-ICP-MS_76	-0.926	0.030	-0.928	0.030	-0.819	0.039	-0.838	0.035					-0.174	0.039	-0.197	0.035
SC_LA MC-ICP-MS_77	-0.906	0.030	-0.902	0.029	-0.792	0.038	-0.816	0.034					-0.147	0.038	-0.175	0.034
SC_LA MC-ICP-MS_78	-0.754	0.030	-0.749	0.029	-0.775	0.039	-0.789	0.035					-0.130	0.039	-0.148	0.035
SC_LA MC-ICP-MS_79	-0.676	0.030	-0.674	0.029	-0.783	0.037	-0.796	0.034					-0.138	0.037	-0.155	0.034
SC_LA MC-ICP-MS_80	-0.813	0.030	-0.812	0.030	-0.852	0.038	-0.832	0.035					-0.207	0.038	-0.191	0.035
SC_LA MC-ICP-MS_81	-0.707	0.030	-0.706	0.030	-0.859	0.039	-0.818	0.034					-0.214	0.039	-0.177	0.034
SC_LA MC-ICP-MS_82	-0.851	0.031	-0.857	0.031	-0.817	0.039	-0.810	0.036					-0.172	0.039	-0.169	0.036
MAC_LA MC-ICP-MS_01	0.853	0.023	0.853	0.023	0.889	0.030	0.884	0.039					0.700	0.030	0.694	0.039
MAC_LA MC-ICP-MS_02	0.788	0.021	0.788	0.021	0.854	0.030	0.854	0.038					0.665	0.030	0.664	0.038
MAC_LA MC-ICP-MS_03	0.900	0.021	0.900	0.021	0.838	0.030	0.843	0.039					0.649	0.030	0.653	0.039
MAC_LA MC-ICP-MS_04	0.864	0.019	0.864	0.019	0.839	0.029	0.834	0.040					0.650	0.029	0.644	0.040
MAC_LA MC-ICP-MS_05	0.793	0.017	0.793	0.017	0.871	0.026	0.880	0.039					0.682	0.026	0.690	0.039
MAC_LA MC-ICP-MS_06	0.804	0.025	0.804	0.025	0.888	0.041	0.897	0.032					0.699	0.041	0.707	0.032
MAC_LA MC-ICP-MS_07	0.913	0.026	0.914	0.026	0.863	0.040	0.860	0.033					0.674	0.040	0.670	0.033
MAC_LA MC-ICP-MS_08	0.834	0.025	0.834	0.025	0.856	0.044	0.834	0.031					0.667	0.044	0.644	0.031
MAC_LA MC-ICP-MS_09	0.858	0.026	0.858	0.026	0.849	0.036	0.857	0.030					0.660	0.036	0.667	0.030

Table S2

	relative to SC (for MAC and MET) and relative to MAC (for SC)								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
MAC_LA MC-ICP-MS_10	0.794	0.026	0.792	0.026	0.810	0.037	0.830	0.031					0.621	0.037	0.640	0.031
MAC_LA MC-ICP-MS_11	0.814	0.063	0.787	0.029	0.843	0.040	0.847	0.034					0.654	0.040	0.657	0.034
MAC_LA MC-ICP-MS_12	0.832	0.024	0.833	0.024	0.819	0.034	0.811	0.025					0.630	0.034	0.621	0.025
MAC_LA MC-ICP-MS_13	0.783	0.028	0.783	0.029	0.856	0.033	0.852	0.027					0.667	0.033	0.662	0.027
MAC_LA MC-ICP-MS_14	0.727	0.025	0.727	0.025	0.857	0.032	0.835	0.025					0.668	0.032	0.645	0.025
MAC_LA MC-ICP-MS_15	0.726	0.031	0.720	0.030	0.783	0.035	0.771	0.030					0.594	0.035	0.581	0.030
MAC_LA MC-ICP-MS_16	0.806	0.031	0.805	0.030	0.790	0.034	0.789	0.029					0.601	0.034	0.599	0.029
MAC_LA MC-ICP-MS_17	0.823	0.026	0.823	0.027	0.832	0.034	0.826	0.027					0.643	0.034	0.636	0.027
MAC_LA MC-ICP-MS_18	0.877	0.025	0.877	0.025	0.816	0.035	0.825	0.026					0.627	0.035	0.635	0.026
MAC_LA MC-ICP-MS_19	0.950	0.025	0.948	0.025	0.836	0.035	0.807	0.027					0.647	0.035	0.617	0.027
MAC_LA MC-ICP-MS_20	0.828	0.024	0.830	0.023	0.786	0.034	0.784	0.027					0.597	0.034	0.594	0.027
MAC_LA MC-ICP-MS_21	0.847	0.022	0.844	0.022	0.826	0.035	0.838	0.026					0.637	0.035	0.648	0.026
MAC_LA MC-ICP-MS_22	0.935	0.020	0.931	0.020	0.858	0.032	0.843	0.025					0.669	0.032	0.653	0.025
MAC_LA MC-ICP-MS_23	0.861	0.023	0.861	0.022	0.843	0.033	0.827	0.026					0.654	0.033	0.637	0.026
MAC_LA MC-ICP-MS_24	0.812	0.031	0.814	0.029	0.804	0.037	0.806	0.032					0.615	0.037	0.616	0.032
MAC_LA MC-ICP-MS_25	0.717	0.031	0.721	0.029	0.771	0.037	0.790	0.032					0.582	0.037	0.600	0.032
MAC_LA MC-ICP-MS_26	0.644	0.025	0.642	0.025	0.787	0.035	0.783	0.033					0.598	0.035	0.593	0.033
MAC_LA MC-ICP-MS_27	0.880	0.029	0.883	0.027	0.799	0.039	0.805	0.034					0.610	0.039	0.615	0.034
MAC_LA MC-ICP-MS_28	0.827	0.029	0.825	0.028	0.797	0.042	0.799	0.037					0.608	0.042	0.609	0.037
MAC_LA MC-ICP-MS_29	0.814	0.029	0.820	0.029	0.796	0.043	0.799	0.036					0.607	0.043	0.609	0.036
MAC_LA MC-ICP-MS_30	0.757	0.032	0.760	0.031	0.782	0.045	0.782	0.038					0.593	0.045	0.592	0.038
MAC_LA MC-ICP-MS_31	0.849	0.040	0.852	0.040	0.840	0.035	0.841	0.031					0.651	0.035	0.651	0.031
MAC_LA MC-ICP-MS_32	0.964	0.036	0.966	0.036	0.870	0.035	0.862	0.031					0.681	0.035	0.672	0.031
MAC_LA MC-ICP-MS_33	0.924	0.034	0.924	0.033	0.852	0.039	0.862	0.034					0.663	0.039	0.672	0.034
MAC_LA MC-ICP-MS_34	0.862	0.032	0.862	0.031	0.830	0.035	0.834	0.032					0.641	0.035	0.644	0.032
MAC_LA MC-ICP-MS_35	0.686	0.029	0.694	0.029	0.836	0.038	0.828	0.032					0.647	0.038	0.638	0.032
MAC_LA MC-ICP-MS_36	0.848	0.030	0.847	0.030	0.809	0.038	0.804	0.033					0.620	0.038	0.614	0.033
MAC_LA MC-ICP-MS_37	0.811	0.055	0.825	0.051	0.858	0.037	0.862	0.032					0.669	0.037	0.672	0.032
MAC_LA MC-ICP-MS_38	0.812	0.028	0.807	0.028	0.816	0.037	0.817	0.034					0.627	0.037	0.627	0.034
MAC_LA MC-ICP-MS_39	0.845	0.029	0.849	0.030	0.811	0.040	0.806	0.035					0.622	0.040	0.616	0.035
MET_LA MC-ICP-MS_01	0.428	0.030	0.435	0.029	0.473	0.042	0.470	0.034					0.284	0.042	0.280	0.034
MET_LA MC-ICP-MS_02	0.562	0.092	0.516	0.030	0.451	0.041	0.461	0.036					0.262	0.041	0.271	0.036
MET_LA MC-ICP-MS_03	0.562	0.031	0.559	0.031	0.489	0.040	0.476	0.035					0.300	0.040	0.286	0.035
MET_LA MC-ICP-MS_04	0.492	0.027	0.495	0.027	0.489	0.034	0.486	0.028					0.300	0.034	0.296	0.028
MET_LA MC-ICP-MS_05	0.409	0.025	0.408	0.025	0.447	0.032	0.458	0.026					0.258	0.032	0.268	0.026
MET_LA MC-ICP-MS_06	0.481	0.024	0.478	0.023	0.446	0.033	0.455	0.025					0.257	0.033	0.265	0.025
MET_LA MC-ICP-MS_07	0.428	0.025	0.431	0.025	0.427	0.033	0.448	0.027					0.238	0.033	0.258	0.027
MET_LA MC-ICP-MS_08	0.465	0.031	0.464	0.030	0.435	0.039	0.433	0.033					0.246	0.039	0.243	0.033
MET_LA MC-ICP-MS_09	0.387	0.028	0.388	0.027	0.417	0.036	0.414	0.032					0.228	0.036	0.224	0.032
MET_LA MC-ICP-MS_10	0.334	0.030	0.336	0.030	0.406	0.038	0.401	0.033					0.217	0.038	0.211	0.033
MET_LA MC-ICP-MS_11	0.474	0.030	0.471	0.031	0.376	0.038	0.367	0.032					0.187	0.038	0.177	0.032

Table S3

	relative to SC								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
Senarmontite solution MC-ICP-MS:																
senar3a-untreated-2									0.331	0.035	0.331	0.035	0.219	0.025	0.203	0.016
senar3b-untreated-1									0.189	0.014	0.189	0.014	0.214	0.027	0.222	0.018
senar3b-untreated-2									0.247	0.017	0.247	0.017	0.221	0.026	0.208	0.017
senar3b-untreated-3									0.196	0.015	0.196	0.015	0.209	0.026	0.210	0.014
senar3b-untreated-4									0.195	0.014	0.195	0.014	0.223	0.025	0.247	0.019
senar3b-purified-1									0.195	0.015	0.195	0.015	0.243	0.028	0.246	0.020
senar3b-purified-2									0.218	0.017	0.218	0.017	0.241	0.027	0.234	0.019
senar3b-purified-3									0.178	0.017	0.178	0.017	0.240	0.035	0.218	0.022
senar3c-untreated-1									0.267	0.018	0.267	0.018	0.216	0.027	0.216	0.018
senar3c-untreated-2									0.252	0.015	0.252	0.015	0.219	0.026	0.230	0.016
senar3c-untreated-3									0.230	0.015	0.230	0.015	0.214	0.023	0.220	0.021
senar3c-purified-1									0.183	0.029	0.179	0.030	0.221	0.031	0.217	0.019
senar3c-purified-2									0.197	0.020	0.194	0.020	0.204	0.032	0.222	0.021
senar3c-purified-3									0.183	0.017	0.181	0.017	0.223	0.033	0.206	0.025
senar3d-untreated-1									0.203	0.018	0.204	0.018	0.222	0.035	0.205	0.023
senar3d-untreated-2									0.199	0.018	0.199	0.018	0.207	0.033	0.202	0.024
senar3d-purified-1									0.296	0.028	0.298	0.028	0.231	0.030	0.225	0.022
senar3d-purified -2									0.255	0.021	0.253	0.020	0.219	0.028	0.223	0.022
senar3e-untreated-1									0.239	0.018	0.239	0.018	0.205	0.034	0.217	0.025
senar3e-untreated-2									0.234	0.017	0.234	0.017	0.207	0.032	0.210	0.021
senar3e-untreated-3									0.230	0.018	0.230	0.018	0.186	0.034	0.222	0.024
senar3e-purified-1									0.258	0.030	0.258	0.030	0.221	0.029	0.228	0.019
senar3e-purified-2									0.212	0.020	0.209	0.021	0.224	0.029	0.225	0.021
Senarmontite LA MC-ICP-MS:																
senar1-1	0.351	0.020	0.351	0.020	0.297	0.030	0.285	0.039					0.108	0.030	0.095	0.039
senar1-2	0.464	0.021	0.464	0.021	0.371	0.032	0.382	0.045					0.182	0.032	0.192	0.045
senar1-3	0.321	0.025	0.321	0.025	0.334	0.032	0.343	0.044					0.145	0.032	0.153	0.044
senar1-4	0.367	0.024	0.367	0.024	0.342	0.033	0.347	0.044					0.153	0.033	0.157	0.044
senar1-5	0.411	0.025	0.411	0.025	0.392	0.037	0.383	0.044					0.203	0.037	0.193	0.044
senar1-6	0.501	0.023	0.501	0.023	0.434	0.032	0.437	0.041					0.245	0.032	0.247	0.041
senar1-7	0.407	0.022	0.407	0.022	0.423	0.036	0.429	0.047					0.234	0.036	0.239	0.047
senar1-8	0.344	0.022	0.344	0.022	0.362	0.037	0.363	0.047					0.173	0.037	0.173	0.047
senar1-9	0.454	0.030	0.453	0.030	0.417	0.046	0.408	0.037					0.228	0.046	0.218	0.037
senar1-10	0.540	0.024	0.540	0.024	0.448	0.042	0.448	0.032					0.259	0.042	0.258	0.032
senar2-1	0.333	0.021	0.333	0.022	0.359	0.036	0.359	0.052					0.170	0.036	0.169	0.052
senar2-2	0.348	0.018	0.348	0.018	0.377	0.029	0.374	0.045					0.188	0.029	0.184	0.045
senar2-3	0.321	0.021	0.321	0.021	0.356	0.029	0.370	0.044					0.167	0.029	0.180	0.044
senar2-4	0.280	0.022	0.280	0.022	0.338	0.031	0.322	0.044					0.149	0.031	0.132	0.044
senar2-5	0.387	0.023	0.388	0.023	0.358	0.033	0.372	0.049					0.169	0.033	0.182	0.049
senar2-6	0.308	0.022	0.309	0.022	0.357	0.030	0.353	0.039					0.168	0.030	0.163	0.039
senar2-7	0.284	0.028	0.287	0.028	0.284	0.038	0.268	0.035					0.095	0.038	0.078	0.035
senar2-8	0.314	0.030	0.317	0.030	0.303	0.043	0.279	0.037					0.114	0.043	0.089	0.037
senar2-9	0.311	0.031	0.318	0.029	0.298	0.038	0.288	0.032					0.109	0.038	0.098	0.032
senar3f-1 (surface)	0.297	0.030	0.294	0.030	0.300	0.045	0.299	0.038					0.111	0.045	0.109	0.038
senar3f-1 (lower depth)	0.148	0.027	0.145	0.027	0.183	0.043	0.218	0.033					-0.006	0.043	0.028	0.033
senar3f-2 (surface)	0.236	0.032	0.233	0.032	0.314	0.048	0.273	0.035					0.125	0.048	0.083	0.035
senar3f-2 (lower depth)	0.179	0.026	0.177	0.026	0.238	0.042	0.249	0.029					0.049	0.042	0.059	0.029
senar3f-3	0.359	0.023	0.363	0.024	0.349	0.036	0.311	0.027					0.160	0.036	0.121	0.027

Table S3

	relative to SC								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
senar3f-4	0.336	0.035	0.340	0.032	0.373	0.045	0.371	0.035					0.184	0.045	0.181	0.035
senar3f-5	0.441	0.030	0.432	0.028	0.392	0.044	0.387	0.032					0.203	0.044	0.197	0.032
senar3f-6	0.360	0.029	0.359	0.028	0.395	0.044	0.389	0.036					0.206	0.044	0.199	0.036
senar3f-7	0.409	0.029	0.406	0.029	0.357	0.044	0.388	0.048					0.168	0.044	0.198	0.048
senar3f-8	0.384	0.030	0.384	0.030	0.369	0.052	0.382	0.036					0.180	0.052	0.192	0.036
senar3f-9	0.334	0.031	0.332	0.031	0.378	0.051	0.364	0.038					0.189	0.051	0.174	0.038
senar3f-10	0.343	0.030	0.343	0.030	0.371	0.053	0.337	0.037					0.182	0.053	0.147	0.037
senar3f-11	0.338	0.027	0.338	0.027	0.328	0.047	0.352	0.033					0.139	0.047	0.162	0.033
senar3f-12	0.349	0.027	0.349	0.027	0.329	0.046	0.353	0.034					0.140	0.046	0.163	0.034
senar3f-13	0.357	0.027	0.357	0.027	0.341	0.049	0.344	0.035					0.152	0.049	0.154	0.035
senar3f-14	0.350	0.026	0.350	0.026	0.344	0.048	0.350	0.033					0.155	0.048	0.160	0.033
Chalcostibite solution MC-ICP-MS:																
chalk1a-untreated-1									-0.010	0.035	-0.010	0.035	-0.160	0.029	-0.151	0.018
chalk1a-untreated-3									-0.076	0.019	-0.076	0.019	-0.157	0.026	-0.165	0.019
chalk1b-untreated-1									-0.086	0.017	-0.086	0.017	-0.144	0.028	-0.132	0.018
chalk1b-untreated-2									-0.127	0.015	-0.127	0.015	-0.148	0.028	-0.158	0.017
chalk1b-untreated-3									-0.251	0.017	-0.251	0.017	-0.134	0.026	-0.155	0.016
chalk1b-untreated-4									-0.137	0.015	-0.137	0.015	-0.154	0.025	-0.166	0.021
chalk1b-purified-1									0.008	0.016	0.008	0.016	-0.105	0.025	-0.102	0.018
chalk1b-purified-2									-0.111	0.015	-0.111	0.015	-0.112	0.029	-0.114	0.018
chalk1b-purified-3									-0.119	0.017	-0.119	0.017	-0.092	0.037	-0.111	0.023
chalk1c-untreated-1									-0.196	0.013	-0.196	0.013	-0.162	0.027	-0.174	0.016
chalk1c-untreated-2									-0.151	0.016	-0.151	0.016	-0.164	0.025	-0.168	0.015
chalk1c-untreated-3									-0.184	0.014	-0.184	0.014	-0.190	0.025	-0.219	0.020
chalk1c-purified-1									-0.070	0.017	-0.070	0.017	-0.150	0.031	-0.136	0.019
chalk1c-purified-2									-0.089	0.017	-0.089	0.017	-0.124	0.037	-0.127	0.024
chalk1c-purified-3									-0.114	0.020	-0.114	0.020	-0.124	0.037	-0.152	0.024
Chalcostibite LA MC-ICP-MS:																
chalk1d-1	0.000	0.033	-0.001	0.033	-0.144	0.040	-0.135	0.036					-0.333	0.040	-0.325	0.036
chalk1d-2	-0.087	0.031	-0.088	0.030	-0.050	0.039	-0.033	0.036					-0.239	0.039	-0.223	0.036
chalk1d-3	0.088	0.025	0.090	0.025	0.041	0.035	0.017	0.030					-0.148	0.035	-0.173	0.030
chalk1d-4	-0.126	0.026	-0.126	0.026	-0.059	0.036	-0.045	0.030					-0.248	0.036	-0.235	0.030
chalk1d-5	-0.136	0.025	-0.137	0.025	-0.131	0.036	-0.132	0.031					-0.320	0.036	-0.322	0.031
chalk1d-6	-0.066	0.027	-0.067	0.027	-0.080	0.037	-0.084	0.031					-0.269	0.037	-0.274	0.031
chalk1d-7	-0.143	0.039	-0.143	0.039	-0.131	0.065	-0.139	0.050					-0.320	0.065	-0.329	0.050
chalk1d-8	0.089	0.039	0.088	0.039	0.084	0.060	0.069	0.045					-0.105	0.060	-0.121	0.045
chalk1d-9	-0.032	0.027	-0.032	0.027	-0.044	0.051	-0.038	0.035					-0.233	0.051	-0.228	0.035
chalk1d-10	-0.079	0.032	-0.079	0.032	-0.093	0.055	-0.087	0.039					-0.282	0.055	-0.277	0.039
chalk1d-11	-0.048	0.037	-0.048	0.037	-0.079	0.070	-0.067	0.044					-0.268	0.070	-0.257	0.044
chalk1d-12	-0.097	0.026	-0.098	0.026	-0.088	0.049	-0.103	0.039					-0.277	0.049	-0.293	0.039
chalk1d-13	-0.083	0.028	-0.083	0.028	-0.111	0.051	-0.107	0.040					-0.300	0.051	-0.297	0.040
chalk1d-14	-0.141	0.027	-0.142	0.027	-0.144	0.051	-0.138	0.038					-0.333	0.051	-0.328	0.038
chalk1d-15	-0.042	0.029	-0.042	0.029	-0.027	0.054	-0.053	0.041					-0.216	0.054	-0.243	0.041
chalk1d-16	0.001	0.030	0.001	0.030	0.001	0.054	0.008	0.039					-0.188	0.054	-0.182	0.039
chalk1d-17	-0.104	0.030	-0.103	0.030	-0.124	0.055	-0.112	0.037					-0.313	0.055	-0.302	0.037
chalk1d-18	-0.082	0.032	-0.082	0.032	-0.104	0.058	-0.096	0.041					-0.293	0.058	-0.286	0.041
chalk1d-19	-0.146	0.030	-0.146	0.030	-0.150	0.057	-0.151	0.038					-0.339	0.057	-0.341	0.038
chalk2-1	-0.050	0.019	-0.050	0.019	-0.006	0.028	-0.003	0.038					-0.195	0.028	-0.193	0.038

Table S3

	relative to SC								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
chalk2-2	-0.167	0.019	-0.167	0.019	-0.025	0.030	-0.011	0.038					-0.214	0.030	-0.201	0.038
chalk2-3	-0.015	0.020	-0.015	0.020	-0.015	0.029	-0.031	0.039					-0.204	0.029	-0.221	0.039
chalk2-4	-0.083	0.019	-0.083	0.019	-0.013	0.029	-0.017	0.039					-0.202	0.029	-0.207	0.039
Zinkenite solution MC-ICP-MS:																
zink1a-untreated-1									-0.331	0.017	-0.331	0.017	-0.375	0.029	-0.380	0.023
zink1b-untreated-1									-0.378	0.019	-0.375	0.019	-0.365	0.030	-0.369	0.023
zink1c-untreated-1									-0.351	0.017	-0.349	0.017	-0.374	0.031	-0.380	0.023
zink1a-purified-1									-0.329	0.031	-0.324	0.031	-0.382	0.029	-0.366	0.020
zink1a-purified-2									-0.312	0.023	-0.314	0.023	-0.372	0.031	-0.371	0.020
zink1a-purified-3									-0.321	0.016	-0.321	0.016	-0.346	0.034	-0.376	0.022
zink1b-purified-1									-0.314	0.032	-0.312	0.033	-0.369	0.029	-0.382	0.020
zink1b-purified-2									-0.306	0.020	-0.304	0.021	-0.390	0.029	-0.375	0.019
zink1b-purified-3									-0.365	0.017	-0.363	0.016	-0.379	0.033	-0.377	0.023
zink1c-purified-1									-0.370	0.025	-0.370	0.026	-0.374	0.028	-0.371	0.020
zink1c-purified-2									-0.380	0.023	-0.382	0.024	-0.370	0.028	-0.369	0.022
zink1c-purified-3									-0.328	0.015	-0.329	0.015	-0.367	0.030	-0.359	0.022
Zinkenite LA MC-ICP-MS:																
zink1d-1	-0.194	0.031	-0.191	0.031	-0.197	0.042	-0.202	0.042					-0.386	0.042	-0.392	0.042
zink1d-2	-0.205	0.030	-0.206	0.029	-0.159	0.039	-0.174	0.033					-0.348	0.039	-0.364	0.033
zink1d-3	-0.239	0.028	-0.239	0.029	-0.162	0.039	-0.172	0.034					-0.351	0.039	-0.362	0.034
zink1e-1	-0.256	0.029	-0.258	0.029	-0.161	0.040	-0.174	0.034					-0.350	0.040	-0.364	0.034
zink1e-2	-0.256	0.028	-0.261	0.029	-0.168	0.039	-0.175	0.035					-0.357	0.039	-0.365	0.035
zink1e-3	-0.151	0.028	-0.152	0.028	-0.186	0.038	-0.162	0.034					-0.375	0.038	-0.352	0.034
Boulangerite solution MC-ICP-MS:																
boula2a-untreated-2									0.788	0.021	0.788	0.021	0.708	0.031	0.704	0.023
boula2a-untreated-3									0.850	0.024	0.850	0.024	0.724	0.037	0.724	0.026
boula2b-untreated-1									0.213	0.019	0.213	0.019	0.160	0.024	0.174	0.016
boula2b-untreated-2									0.261	0.019	0.261	0.019	0.179	0.024	0.171	0.018
boula2b-untreated-3									0.270	0.021	0.270	0.021	0.181	0.024	0.202	0.019
boula2c-untreated-1									0.172	0.019	0.172	0.019	0.160	0.028	0.170	0.019
boula2c-untreated-2									0.129	0.019	0.129	0.019	0.160	0.026	0.163	0.018
boula2c-untreated-3									0.080	0.018	0.081	0.018	0.153	0.027	0.161	0.020
boula2c-untreated-4									0.116	0.018	0.116	0.018	0.180	0.024	0.171	0.019
boula2d-untreated-1									0.425	0.020	0.424	0.021	0.412	0.035	0.418	0.022
boula2d-untreated-2									0.449	0.018	0.450	0.018	0.412	0.033	0.435	0.025
boula2d-purified-1									0.456	0.033	0.457	0.034	0.431	0.027	0.410	0.019
boula2d-purified-2									0.430	0.022	0.431	0.022	0.406	0.030	0.429	0.022
boula2d-purified-3									0.450	0.018	0.450	0.018	0.412	0.035	0.410	0.021
boula2e-untreated-1									0.359	0.017	0.359	0.017	0.379	0.029	0.390	0.022
boula2e-untreated-2									0.361	0.018	0.361	0.018	0.406	0.035	0.396	0.020
boula2e-untreated-3									0.360	0.016	0.361	0.016	0.359	0.034	0.388	0.021
boula2e-purified-1									0.446	0.033	0.446	0.033	0.405	0.030	0.382	0.018
boula2e-purified-2									0.473	0.023	0.474	0.023	0.391	0.029	0.379	0.021
boula2e-purified-3									0.393	0.015	0.393	0.015	0.393	0.033	0.384	0.020

Table S3

	relative to SC								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
Boulangerite LA MC-ICP-MS																
boula2f-1	0.458	0.022	0.458	0.022	0.413	0.036	0.411	0.027					0.224	0.036	0.221	0.027
boula2f-3	0.699	0.028	0.698	0.028	0.666	0.045	0.671	0.034					0.477	0.045	0.481	0.034
boula2f-4	0.665	0.027	0.665	0.027	0.675	0.044	0.672	0.032					0.486	0.044	0.482	0.032
boula2f-5	0.665	0.022	0.665	0.022	0.701	0.042	0.691	0.030					0.512	0.042	0.501	0.030
boula2f-6	0.688	0.022	0.688	0.022	0.763	0.041	0.747	0.031					0.574	0.041	0.557	0.031
boula2f-7	0.822	0.022	0.821	0.022	0.859	0.040	0.869	0.030					0.670	0.040	0.679	0.030
boula2f-8	0.378	0.024	0.378	0.024	0.352	0.040	0.370	0.031					0.163	0.040	0.180	0.031
boula2f-9	0.366	0.026	0.362	0.027	0.464	0.034	0.458	0.028					0.275	0.034	0.268	0.028
boula2f-10	0.747	0.030	0.744	0.030	0.849	0.032	0.857	0.028					0.660	0.032	0.667	0.028
boula2f-11	0.727	0.024	0.723	0.024	0.723	0.033	0.733	0.027					0.534	0.033	0.543	0.027
boula2f-12	0.622	0.025	0.617	0.024	0.628	0.035	0.638	0.028					0.439	0.035	0.448	0.028
boula1-1	0.333	0.025	0.332	0.025	0.395	0.043	0.413	0.034					0.206	0.043	0.223	0.034
boula1-2	0.334	0.023	0.334	0.023	0.344	0.040	0.352	0.029					0.155	0.040	0.162	0.029
boula1-3	0.303	0.023	0.303	0.023	0.385	0.041	0.395	0.029					0.196	0.041	0.205	0.029
boula1-4	0.437	0.025	0.439	0.025	0.398	0.033	0.408	0.027					0.209	0.033	0.218	0.027
boula1-5	0.415	0.025	0.413	0.024	0.433	0.032	0.436	0.027					0.244	0.032	0.246	0.027
boula1-6	0.572	0.028	0.575	0.027	0.597	0.033	0.612	0.027					0.408	0.033	0.422	0.027
boula1-7	0.266	0.025	0.266	0.024	0.320	0.033	0.324	0.027					0.131	0.033	0.134	0.027
Bournonite solution MC-ICP-MS:																
bourn1a-untreated-1									0.443	0.018	0.443	0.018	0.306	0.026	0.303	0.016
bourn1a-untreated-2									0.389	0.016	0.388	0.016	0.294	0.025	0.290	0.014
bourn1a-untreated-3									0.371	0.013	0.371	0.013	0.316	0.024	0.325	0.017
bourn2a-untreated-1									0.608	0.021	0.608	0.021	0.555	0.029	0.573	0.023
bourn2a-untreated-2									0.709	0.027	0.709	0.027	0.573	0.037	0.574	0.028
bourn2b-untreated-1									0.481	0.019	0.481	0.019	0.398	0.026	0.403	0.017
bourn2b-untreated-2									0.465	0.017	0.465	0.017	0.409	0.025	0.398	0.015
bourn2b-untreated-3									0.427	0.014	0.427	0.014	0.389	0.024	0.385	0.018
bourn2c-untreated-1									0.145	0.018	0.144	0.018	0.151	0.032	0.171	0.023
bourn2c-untreated-2									0.199	0.017	0.199	0.017	0.138	0.033	0.163	0.024
bourn2c-purified-1									0.233	0.029	0.236	0.029	0.160	0.029	0.154	0.021
bourn2c-purified-2									0.258	0.023	0.258	0.023	0.185	0.029	0.182	0.021
bourn2c-purified-3									0.172	0.017	0.172	0.017	0.148	0.031	0.160	0.023
bourn2d-untreated-1									0.233	0.018	0.232	0.018	0.186	0.030	0.187	0.020
bourn2d-purified-1									0.225	0.028	0.231	0.029	0.201	0.029	0.185	0.021
bourn2d-purified-2									0.218	0.021	0.218	0.021	0.175	0.028	0.183	0.022
bourn2d-purified-3									0.220	0.018	0.220	0.018	0.150	0.032	0.175	0.025
Bournonite LA MC-ICP-MS:																
bourn1b-1	0.461	0.023	0.461	0.023	0.412	0.040	0.391	0.029					0.223	0.040	0.201	0.029
bourn1b-2	0.657	0.023	0.657	0.023	0.579	0.040	0.584	0.031					0.390	0.040	0.394	0.031
bourn1b-3	0.598	0.022	0.598	0.022	0.572	0.039	0.566	0.029					0.383	0.039	0.376	0.029
bourn1b-4	0.416	0.022	0.416	0.022	0.438	0.038	0.436	0.028					0.249	0.038	0.246	0.028
bourn1b-5	0.481	0.024	0.481	0.024	0.494	0.039	0.471	0.029					0.305	0.039	0.281	0.029
bourn1b-6	0.478	0.024	0.477	0.024	0.450	0.042	0.442	0.030					0.261	0.042	0.252	0.030
bourn1b-7	0.430	0.023	0.430	0.023	0.424	0.039	0.418	0.029					0.235	0.039	0.228	0.029
bourn1b-8	0.442	0.024	0.441	0.024	0.436	0.042	0.407	0.029					0.247	0.042	0.217	0.029
bourn1b-9	0.527	0.024	0.527	0.024	0.481	0.041	0.487	0.030					0.292	0.041	0.297	0.030
bourn3-1	0.434	0.025	0.434	0.026	0.443	0.032	0.469	0.027					0.254	0.032	0.279	0.027

Table S3

	relative to SC								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
bourn3-2	0.275	0.029	0.272	0.029	0.298	0.033	0.302	0.028					0.109	0.033	0.112	0.028
bourn3-3	0.476	0.029	0.469	0.029	0.427	0.032	0.420	0.028					0.238	0.032	0.230	0.028
bourn3-4	0.723	0.026	0.724	0.026	0.578	0.032	0.584	0.027					0.389	0.032	0.394	0.027
bourn3-5	0.562	0.026	0.559	0.026	0.554	0.031	0.532	0.028					0.365	0.031	0.342	0.028
bourn3-6	0.505	0.026	0.504	0.025	0.476	0.032	0.479	0.028					0.287	0.032	0.289	0.028
Tetrahedrite solution MC-ICP-MS:																
Tetra1a-untreated-1									0.283	0.025	0.283	0.025	0.181	0.028	0.194	0.019
Tetra1a-untreated-3									0.309	0.022	0.309	0.022	0.198	0.026	0.195	0.018
Tetra1b-untreated-1									0.195	0.017	0.195	0.017	0.179	0.028	0.171	0.018
Tetra1b-untreated-2									0.251	0.019	0.251	0.019	0.169	0.024	0.166	0.017
Tetra1b-purified-1									0.258	0.017	0.258	0.017	0.206	0.038	0.199	0.021
Tetra1b-purified-2									0.065	0.018	0.065	0.018	0.174	0.040	0.161	0.025
Tetra1b-purified-3									0.173	0.030	0.173	0.030	0.160	0.033	0.159	0.020
Tetrahedrite LA MC-ICP-MS:																
Tetra1c-1	0.373	0.040	0.373	0.041	0.367	0.043	0.325	0.061					0.178	0.043	0.135	0.061
Tetra1c-2	0.376	0.035	0.376	0.035	0.297	0.037	0.259	0.059					0.108	0.037	0.069	0.059
Tetra1c-3	0.497	0.028	0.497	0.028	0.430	0.037	0.426	0.052					0.241	0.037	0.236	0.052
Tetra1c-4	0.377	0.027	0.376	0.027	0.294	0.033	0.264	0.050					0.105	0.033	0.074	0.050
Tetra1c-5	0.187	0.024	0.187	0.024	0.268	0.030	0.266	0.038					0.079	0.030	0.076	0.038
Tetra1c-6	0.300	0.026	0.299	0.026	0.324	0.031	0.324	0.048					0.135	0.031	0.134	0.048
Tetra1c-7	0.356	0.024	0.356	0.024	0.295	0.031	0.275	0.041					0.106	0.031	0.085	0.041
Dyscrasite solution MC-ICP-MS:																
Py572-1a-untreated-1									-0.125	0.017	-0.125	0.017	-0.107	0.032	-0.127	0.024
Py572-1a-untreated-2									-0.069	0.016	-0.069	0.016	-0.088	0.035	-0.147	0.026
Py572-1b-untreated-1									-0.121	0.018	-0.121	0.018	-0.127	0.033	-0.175	0.023
Py572-1b-untreated-2									-0.118	0.017	-0.116	0.018	-0.135	0.039	-0.170	0.026
Py572-1b-purified-1									-0.016	0.026	-0.012	0.027	-0.128	0.030	-0.130	0.018
Py572-1b-purified-2									-0.069	0.019	-0.069	0.019	-0.137	0.035	-0.129	0.019
Py572-1b-purified-3									-0.091	0.016	-0.091	0.016	-0.147	0.032	-0.145	0.022
Dyscrasite LA MC-ICP-MS:																
Py572-1c-1	0.062	0.026	0.061	0.026	0.107	0.036	0.112	0.029					-0.082	0.036	-0.078	0.029
Py572-1c-2	0.078	0.026	0.075	0.026	0.129	0.036	0.123	0.030					-0.060	0.036	-0.067	0.030
Py572-1c-3	0.099	0.030	0.098	0.030	0.059	0.056	0.084	0.038					-0.130	0.056	-0.106	0.038
Py572-1c-4	0.129	0.025	0.128	0.025	0.111	0.053	0.125	0.035					-0.078	0.053	-0.065	0.035
Py572-1c-5	0.091	0.028	0.090	0.028	0.067	0.055	0.092	0.038					-0.122	0.055	-0.098	0.038
Py572-1c-6	0.114	0.031	0.113	0.031	0.098	0.060	0.111	0.040					-0.091	0.060	-0.079	0.040
Py572-1c-7	0.083	0.033	0.081	0.033	0.088	0.062	0.087	0.040					-0.101	0.062	-0.103	0.040
Py572-1c-8	0.091	0.033	0.089	0.033	0.102	0.061	0.133	0.039					-0.087	0.061	-0.057	0.039
Pyrrargyrite solution MC-ICP-MS:																
Py573-1a-untreated-1									-0.214	0.015	-0.214	0.015	-0.201	0.025	-0.182	0.019
Py573-1a-untreated-2									-0.192	0.018	-0.193	0.018	-0.190	0.025	-0.191	0.018
Py573-1a-untreated-3									-0.240	0.018	-0.240	0.018	-0.201	0.023	-0.209	0.017
Py573-1a-purified-1									-0.223	0.025	-0.225	0.025	-0.215	0.028	-0.219	0.020
Py573-1a-purified-2									-0.201	0.019	-0.199	0.020	-0.205	0.033	-0.219	0.021
Py573-1a-purified-3									-0.194	0.017	-0.194	0.018	-0.195	0.035	-0.198	0.023

Table S3

	relative to SC								relative to NIST							
	raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)		raw + blk corr		MB-Te + blk		MB corr(¹¹⁹ Sn/ ¹¹⁷ Sn)		MB corr(¹²⁰ Sn/ ¹¹⁸ Sn)	
	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ	$\delta^{123}\text{Sb}$ [‰]	2 σ
Py573-1b-untreated-1																
Py573-1b-untreated-2																
Py573-1b-purified-1																
Py573-1b-purified-2																
Py573-1b-purified-3																
Pyrrargyrite LA MC-ICP-MS:																
Py573-1c-1(high energy)	0.013	0.026	0.009	0.026	0.082	0.035	0.091	0.029					-0.107	0.035	-0.099	0.029
Py573-1c-2(high energy)	-0.034	0.024	-0.035	0.024	0.071	0.033	0.082	0.026					-0.118	0.033	-0.108	0.026
Py573-1c-3(high energy)	0.121	0.027	0.116	0.027	0.102	0.035	0.096	0.029					-0.087	0.035	-0.094	0.029
Py573-1c-4(high energy)	0.081	0.025	0.078	0.024	0.097	0.034	0.080	0.028					-0.092	0.034	-0.11	0.028
Py573-1c-5(low energy)	0.071	0.027	0.070	0.027	0.048	0.053	0.075	0.035					-0.141	0.053	-0.115	0.035
Py573-1c-6(low energy)	0.062	0.028	0.061	0.028	0.042	0.052	0.074	0.037					-0.147	0.052	-0.116	0.037
Py573-1c-7(low energy)	0.047	0.031	0.047	0.031	0.056	0.051	0.052	0.035					-0.133	0.051	-0.138	0.035
Py573-1c-8(low energy)	-0.046	0.033	-0.047	0.033	-0.036	0.053	-0.036	0.037					-0.225	0.053	-0.226	0.037
Py573-1c-9(low energy)	-0.081	0.034	-0.081	0.034	-0.046	0.054	-0.034	0.038					-0.235	0.054	-0.224	0.038
Pyrrargyrite solution MC-ICP-MS:																
Py574-1a-untreated-1													-0.464	0.019	-0.465	0.019
Py574-1a-untreated-2													-0.526	0.017	-0.526	0.017
Py574-1b-untreated-1													-0.541	0.016	-0.540	0.016
Py574-1b-untreated-2													-0.547	0.018	-0.548	0.018
Py574-1a-purified-1													-0.447	0.015	-0.446	0.015
Py574-1a-purified-2													-0.480	0.022	-0.480	0.022
Py574-1a-purified-3													-0.415	0.018	-0.415	0.018
Py574-1b-purified-1													-0.469	0.026	-0.469	0.027
Py574-1b-purified-2													-0.456	0.020	-0.458	0.021
Py574-1b-purified-3													-0.480	0.017	-0.480	0.017
Pyrrargyrite LA MC-ICP-MS:																
Py574-1c-1 (high energy)	-0.134	0.027	-0.137	0.027	-0.192	0.035	-0.177	0.027					-0.381	0.035	-0.367	0.027
Py574-1c-2 (high energy)	-0.282	0.026	-0.285	0.026	-0.302	0.034	-0.299	0.026					-0.491	0.034	-0.489	0.026
Py574-1c-3 (high energy)	-0.266	0.026	-0.268	0.026	-0.262	0.034	-0.257	0.027					-0.451	0.034	-0.447	0.027
Py574-1c-5 (low energy)	-0.414	0.039	-0.415	0.039	-0.369	0.058	-0.365	0.045					-0.558	0.058	-0.555	0.045
Py574-1c-6 (low energy)	-0.339	0.036	-0.339	0.036	-0.313	0.058	-0.311	0.044					-0.502	0.058	-0.501	0.044
Py574-1c-7 (low energy)	-0.286	0.036	-0.286	0.036	-0.311	0.057	-0.315	0.042					-0.500	0.057	-0.505	0.042