

Supporting Information for Sulfur isotopes from the lunar farside reveal global volatile loss following the gaint impact

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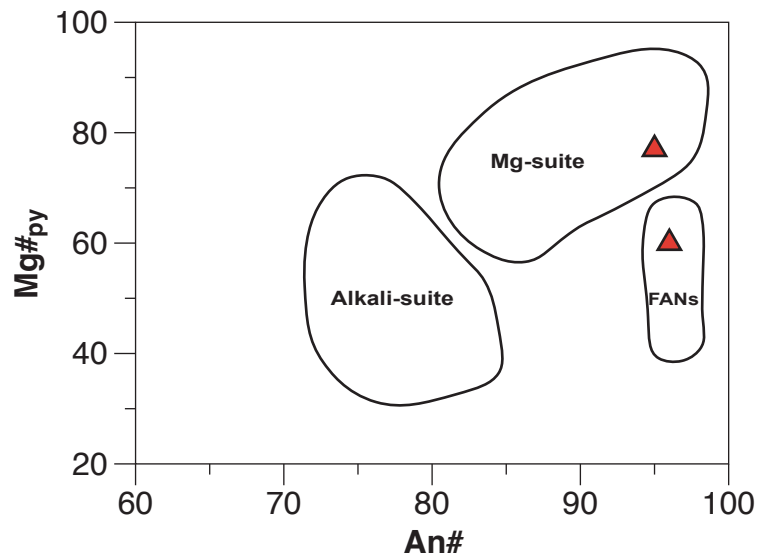


Fig. S1. The main lithologies of crustal clasts. Plot of Mg# ($\text{Mg}/(\text{Mg} + \text{Fe})$) of orthopyroxene versus An# ($\text{Ca}/(\text{Ca} + \text{Na})$) in plagioclase in crustal clasts collected from CE-6 samples. The composition fields for FANs, Mg-suite, and Alkali-suite are modified from literature¹.

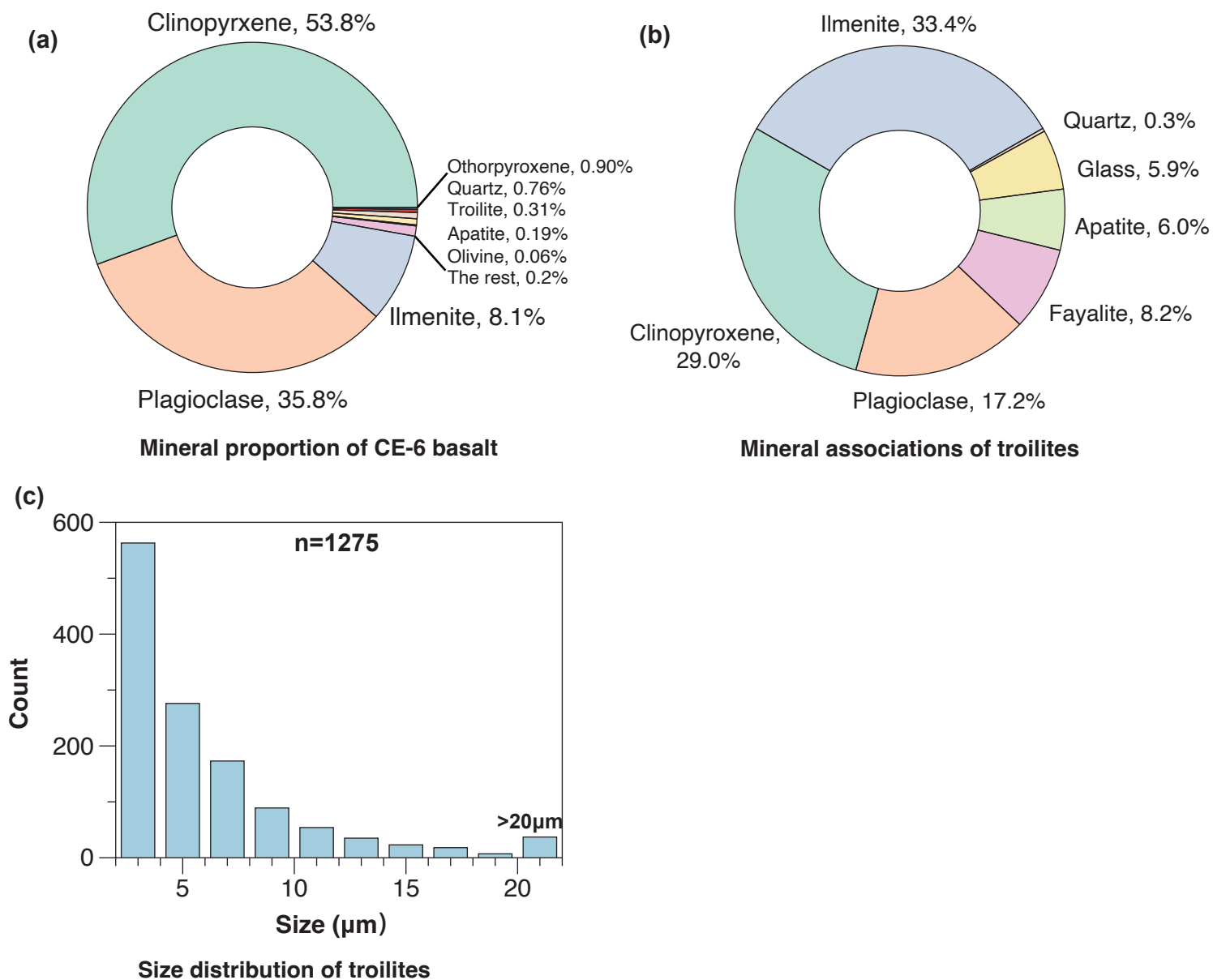


Fig. S2. Mineral proportion of CE-6 basalt clasts (a), phases associated with troilites in the CE-6 soil (b), and size distribution of troilites in the CE-6 soil (c).

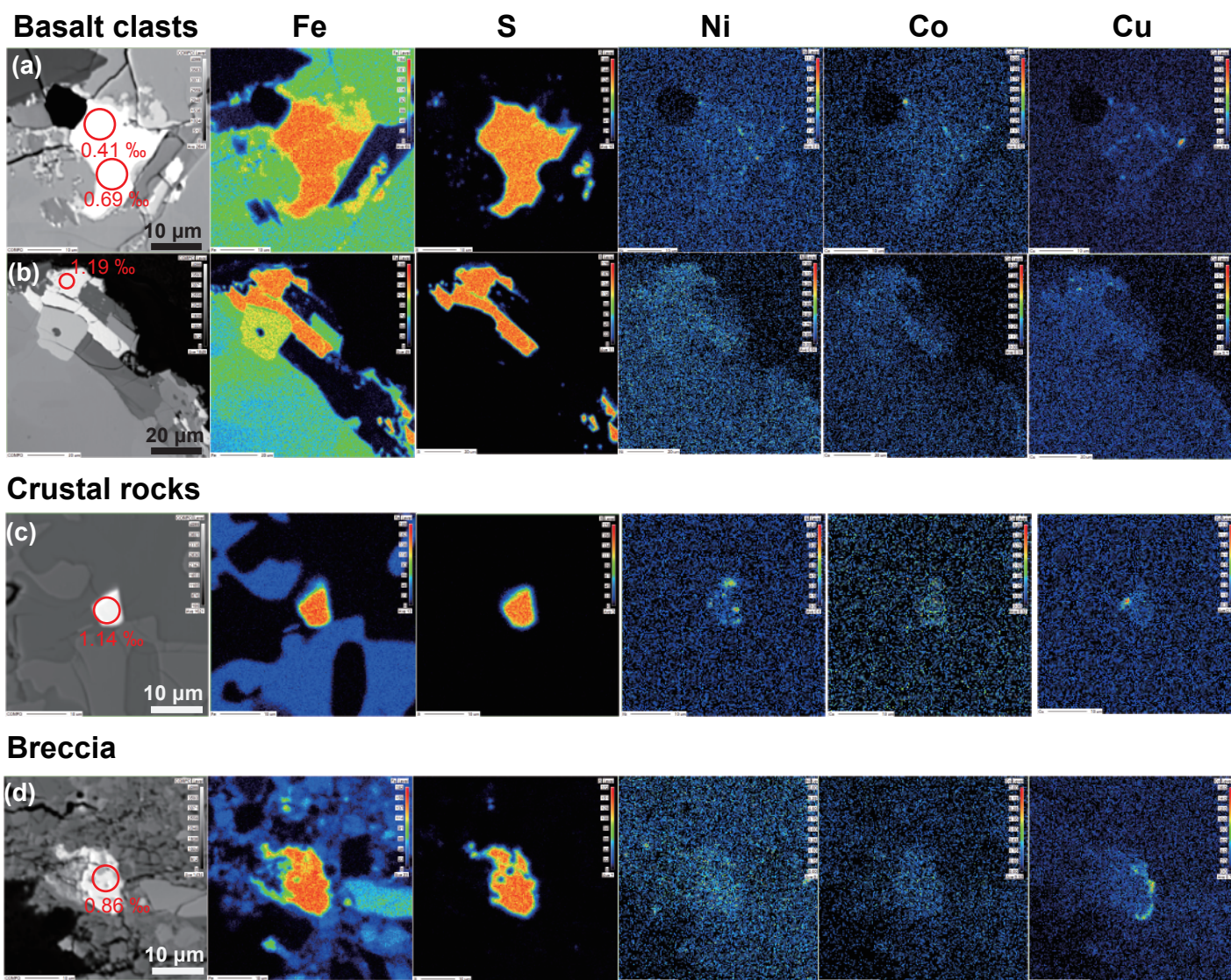


Fig. S3. Element mapping of troilites in basaltic fragments, crustal rock and breccia in CE-6 soil. The troilite generally contains low Ni, Mn, Co, and Cu contents (see Table S3 for details), occasionally with Ni- or Cu-rich spots.

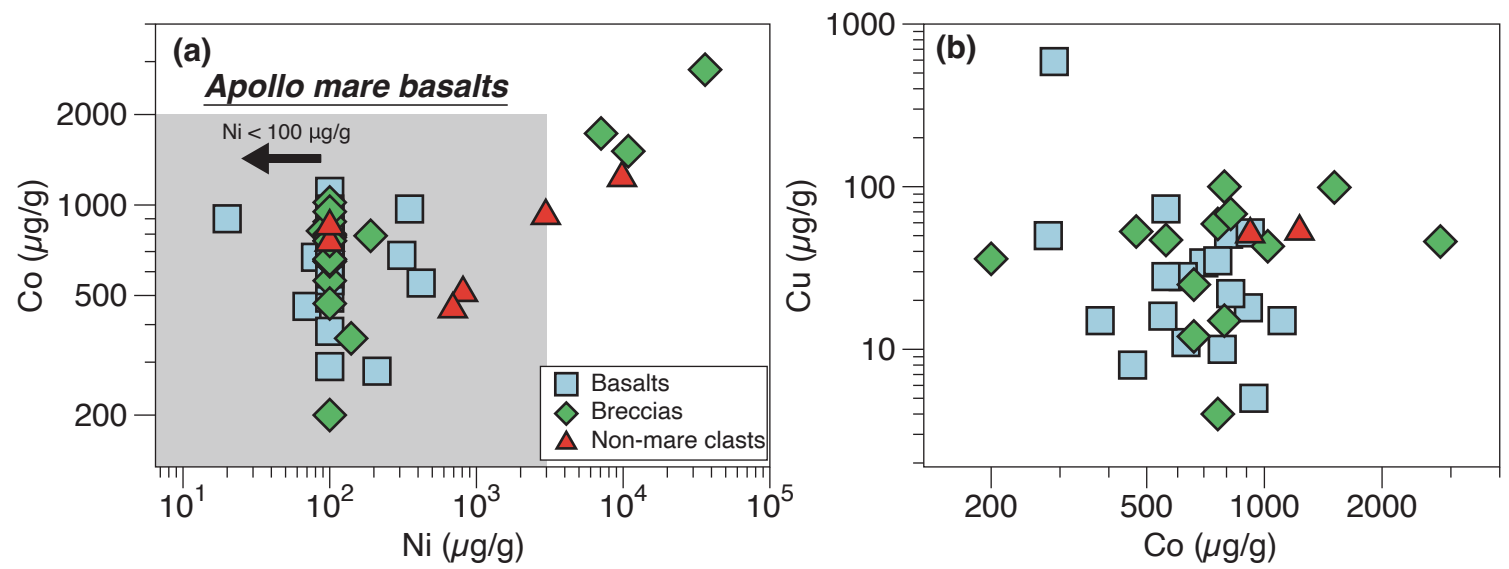


Fig. S4. Ni vs. Co (a) and Cu vs. Co (b) content of troilites in the CE-6 soil fragments. Many are lower than detection limits of around 100 $\mu\text{g/g}$. The gray shaded area in (a) represents the compositional range of troilite from Apollo mare basalts².

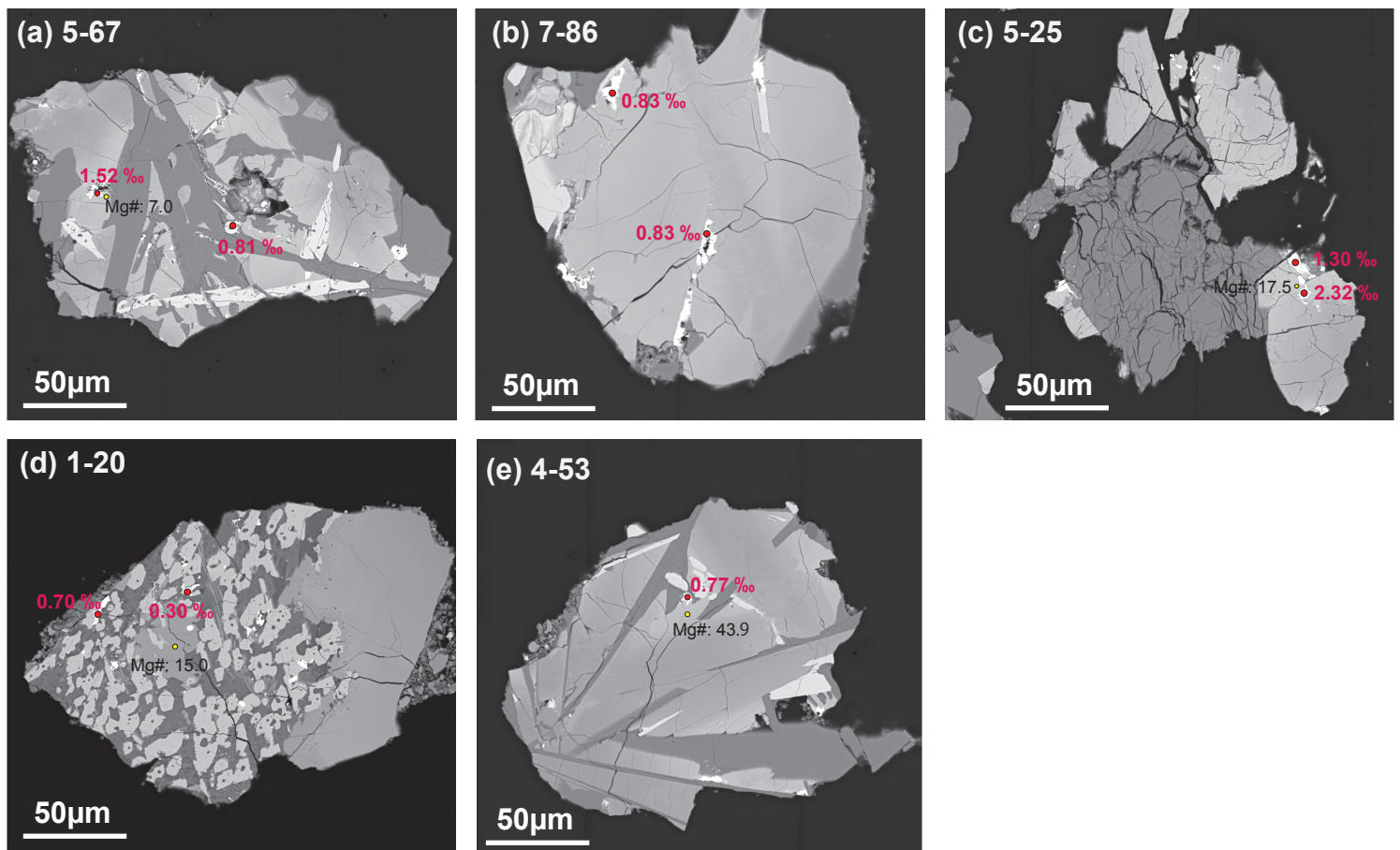


Fig. S5. Supplementary petrographic images and sulfur-Isotope data points.

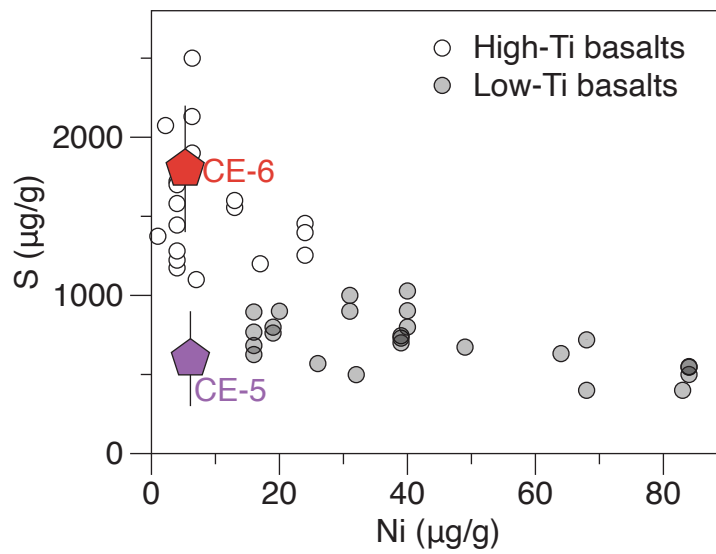


Fig. S6. Ni and S content of CE-6 basalt, CE-5 basalt and Apollo basalts. The low content of Ni in CE-6 basalt indicates that the presence of Ni-rich sulfide is unlikely in the lunar mantle source. The data of CE-6, CE-5 are from the literature^{3,4} and the data of Apollo mare basalts are from Lunar Sample Compendium (<https://wwwcurator.jsc.nasa.gov/lunar/lsc/index.cfm>).

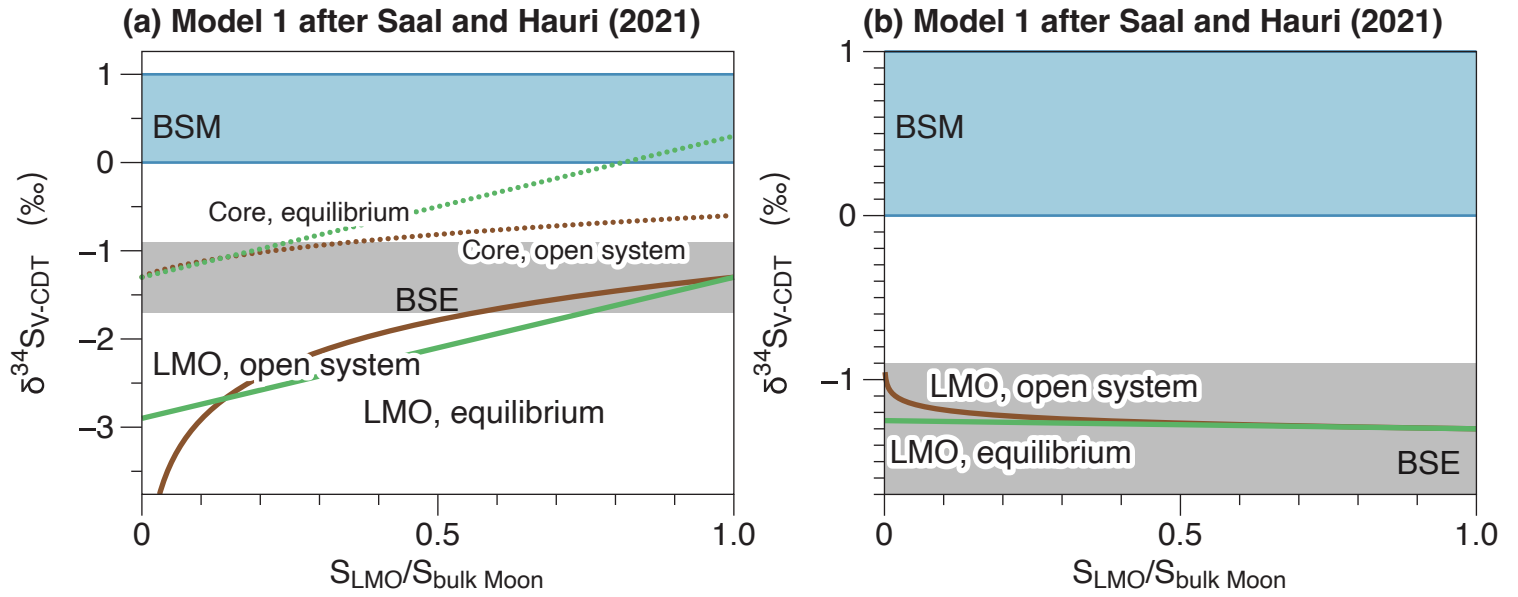


Fig. S7. Core-LMO sulfur partitioning model equilibrium or open system. The $\delta^{34}\text{S}$ values (‰) of the LMO and lunar core are plotted against the ratio of the sulfur content of LMO during core segregation to that of the bulk Moon. Model 1 (a) is after Saal and Hauri (2021)⁵. An equilibrium sulfur isotope fractionation factor $\alpha_{\text{core-mantle}}$ of 1.0016 and 1.0007 for batch equilibrium and open system, respectively. We start with a BSE $\delta^{34}\text{S}$ value of -1.3 ± 0.4 ‰. Model 2 (a) is after Wang et al. (2021)⁶, using the the sulfur isotope fractionation factor $\alpha_{\text{core-mantle}}$ of 0.99995, our calculationg demonstrated that the fractionation bewteen the core and silicate mantle is much smaller than the ~ 2 ‰ offset we observe.

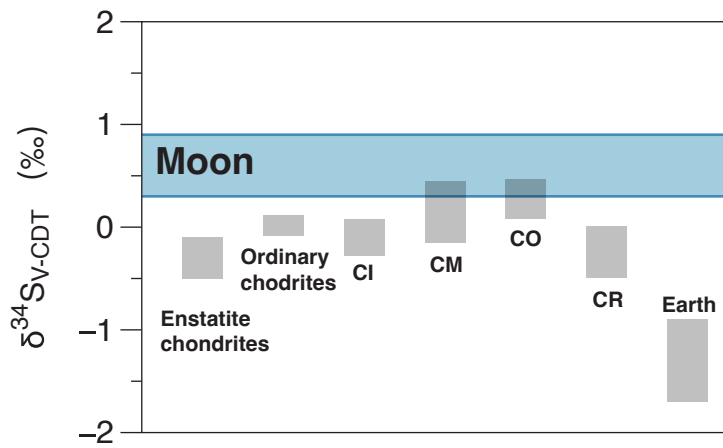


Fig. S8. The $\delta^{34}\text{S}$ value of different chondrites. Only CM and CO carbonaceous chondrites show $\delta^{34}\text{S}$ values that slightly overlap with BSM. Data source: data of ordinary chondrites are from the reference^{7,8}. Data of enstatite chondrites are from the reference⁹. Data of CI, CM, CO and CR are from the reference¹⁰.

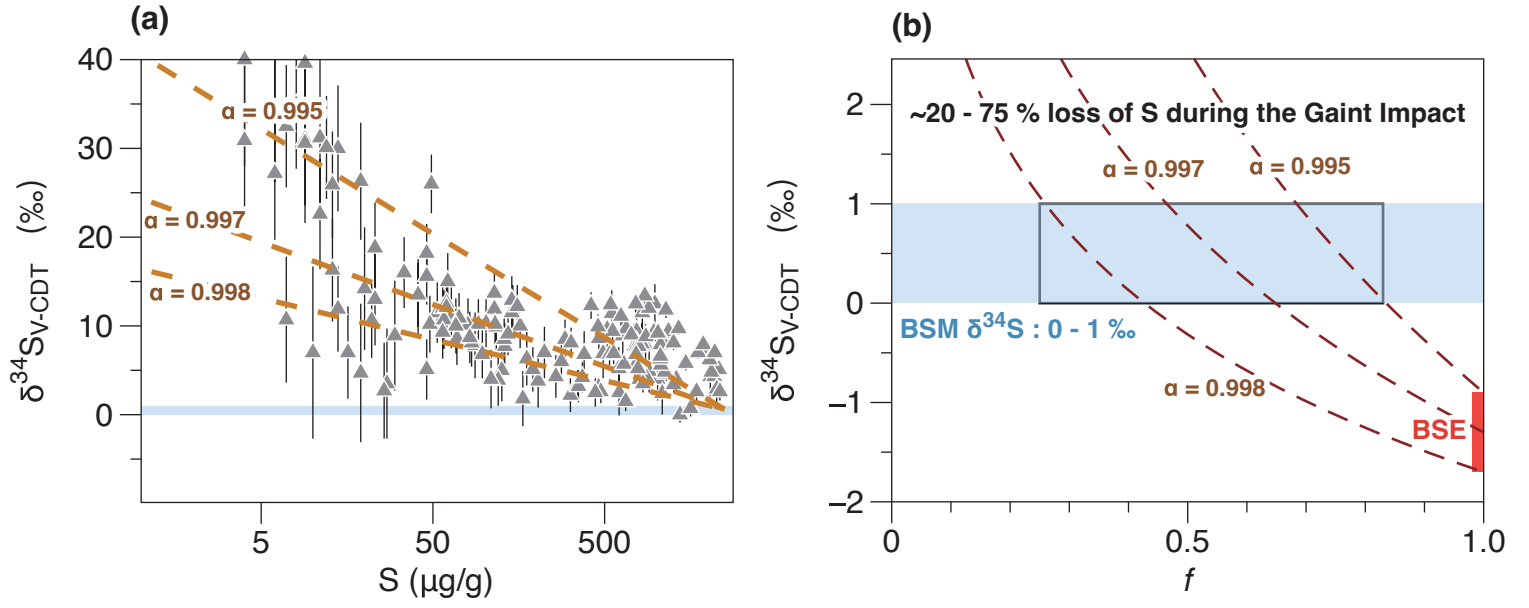


Fig. S9. Sulfur degassing during surface impact processes and the giant impact event. According to the Rayleigh distillation equation: $\delta^{34}\text{S} = (1000 + \delta^{34}\text{S}_0) \times f^{\alpha-1} - 1000$, where $\delta^{34}\text{S}_0$ represents the initial sulfur isotopic composition and f is the remaining fraction of sulfur after evaporation. In this calculation, we use an initial $\delta^{34}\text{S}_0$ of $-1.3 \pm 0.4\text{‰}$ (representative of the BSE) and an initial sulfur content of $2500 \mu\text{g/g}$. Based on the observed relationship between sulfur content and sulfur isotopic composition in lunar impact glasses, the sulfur isotope fractionation factor (α) during impact-induced volatilization can be constrained to a range of 0.995–0.998 (a). Using this range of α values, we estimate that achieving the present $\delta^{34}\text{S}$ value of the BSM would require approximately 20–75% sulfur loss during the giant impact event (b). Error bars represent ± 2 standard errors (2SE) of $\delta^{34}\text{S}$ measurements.

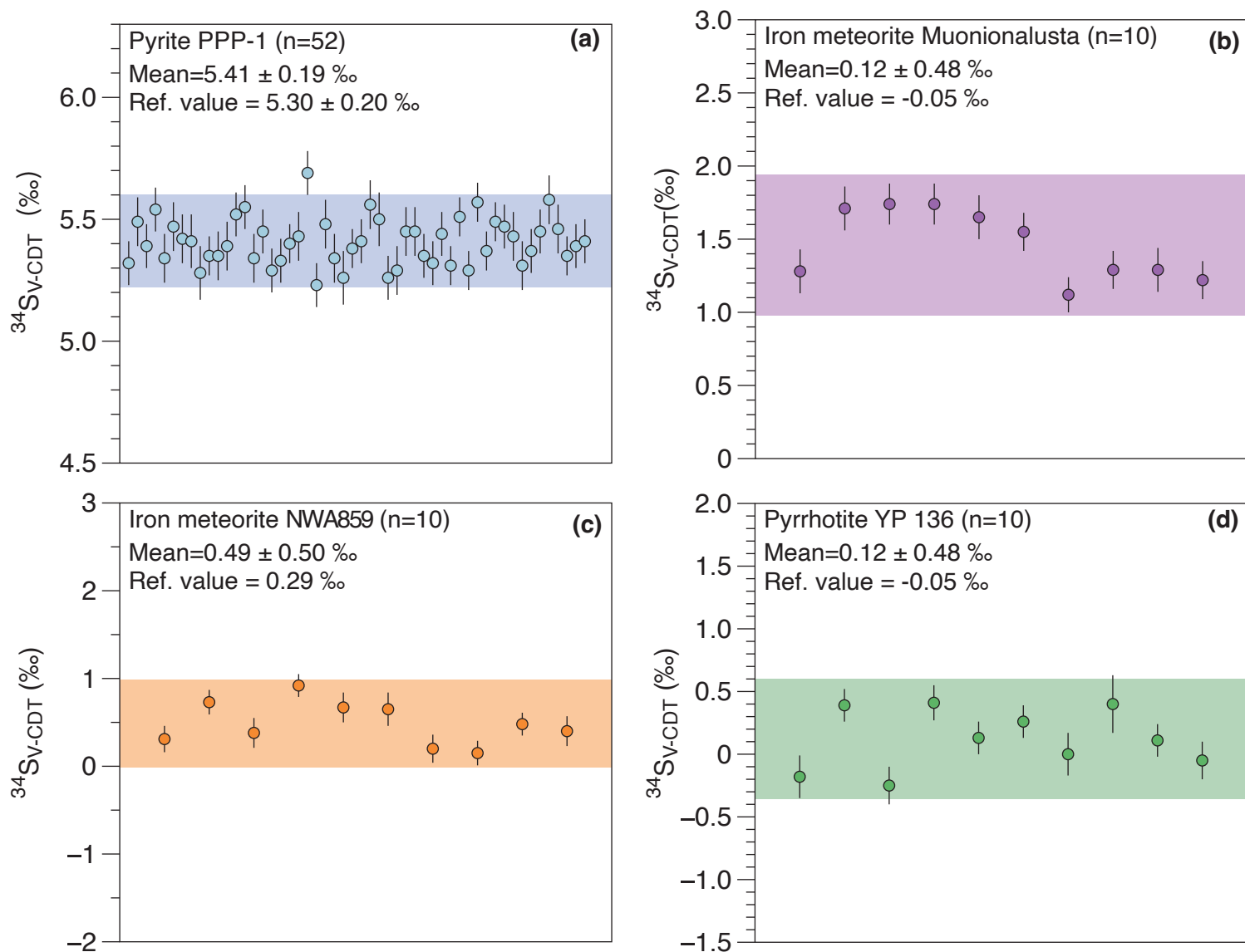


Fig. S10. Reproducibility of $\delta^{34}\text{SV-CDT}$ data of two sulfide references and two iron meteorites obtained by laser-ablation MC-ICP-MS (at 8- μm laser spot sizes). These data indicate the reliability of our laser-ablation MC-ICP-MS approach with external uncertainty of ~ 0.50 ‰ (2SD) at a level similar to those obtained from other CE-5 fragments¹¹ and CDT using nano-SIMS¹². Error bars represent ± 2 standard errors (2SE) of $\delta^{34}\text{S}$ measurements.

Table S1. Mineral composition of clinopyroxene and plagioclase in CE-6 basalt and crustal clasts.

		Na2O	MgO	SiO2	Al2O3	CaO	P2O5	K2O	FeO	TiO2	MnO	NiO	Cr2O3	Total	Fo
4-28	Cpx	0.05	26.46	54.19	1.80	1.85	-	0.001	13.74	0.63	0.21	0.05	0.66	99.6	77.0
5-48	Cpx	0.04	19.27	51.86	0.62	3.48	-	0.01	22.70	0.40	0.32	0.01	0.46	99.1	60.0
2-14	Cpx	0.06	8.65	47.77	1.56	11.87	-	-	27.77	1.24	0.38	-	0.15	99.4	35.7
4-32	Cpx	0.02	0.80	45.33	1.10	11.56	0.02	-	41.91	0.88	0.38	0.02	0.06	102.1	3.3
4-53	Cpx	0.02	10.01	47.63	2.42	15.00	-	-	22.80	1.78	0.31	0.04	0.30	100.3	43.9
5-25	Cpx	-	4.17	47.09	1.63	10.37	-	0.01	34.75	1.51	0.43	0.13	0.05	100.1	17.5
5-67	Cpx	0.02	1.82	45.48	1.01	10.21	0.03	0.01	42.04	0.86	0.49	-	0.01	102.0	7.0
1-4	Cpx		0.22	45.22	1.47	17.74	0.04	0.00	34.44	1.28	0.36	0.01	0.02	100.8	1.1
1-20	Cpx	0.02	3.66	47.03	1.11	9.17	-	0.01	37.00	1.15	0.42	0.14	0.02	99.7	15.0
1-41	Cpx		0.50	44.72	1.92	16.40	0.02	-	34.73	1.72	0.39	0.03	0.01	100.4	2.5
1-155	Cpx	0.03	0.12	44.14	0.78	5.29	-	-	50.71	0.71	0.51	-	0.02	102.3	0.5
															An
4-28	PI	0.32	0.12	43.18	35.99	19.92	0.01	0.03	0.34	-	-	-	-	99.9	97.0
5-48	PI	0.38	0.10	43.14	35.34	19.14	-	0.05	0.21	0.01	0.01	-	-	98.4	96.0

Table 2. Mineral abundance of CE-6 basalt clasts, NWA 12008 and NWA 14526 analysed by TIMA.

Basalt clast #	Cpx	Pl	Opx	Ilm	Oi	Tro	Q	Ap	Chromite	Zircon	Glass
CE-6											
1-136	54.14	33.91	0.26	10.99	0.08	0.42	0.00	0.20	0.00	0.00	
1-47	54.16	38.44	0.46	6.49	0.03	0.31	0.00	0.10	0.00	0.00	
1-59	38.62	50.96	0.04	9.12	0.08	0.30	0.68	0.21	0.00	0.00	
1-63	52.10	37.11	0.61	9.67	0.04	0.35	0.07	0.04	0.00	0.00	
1-65	61.12	29.47	0.78	6.90	0.11	0.69	0.70	0.24	0.00	0.00	
1-97	53.47	37.19	0.06	7.04	0.04	0.65	0.92	0.63	0.00	0.00	
1-128	64.64	27.63	0.22	7.47	0.02	0.01	0.00	0.01	0.00	0.00	
1-157	52.06	36.11	0.84	6.79	0.10	0.50	0.00	0.22	3.39	0.00	
1-162	54.71	34.65	4.95	4.97	0.01	0.08	0.52	0.11	0.00	0.00	
1-180	40.61	51.45	0.87	3.79	0.07	0.81	1.74	0.67	0.00	0.00	
2-1	59.27	33.05	0.72	6.36	0.06	0.38	0.00	0.18	0.00	0.00	
2-8	56.85	31.53	2.72	8.44	0.04	0.29	0.03	0.10	0.00	0.00	
2-12-1	75.45	16.40	2.62	5.04	0.05	0.20	0.00	0.23	0.00	0.00	
2-12-2	45.63	28.12	1.09	10.74	0.02	0.34	13.89	0.17	0.00	0.00	
2-18	42.87	40.17	0.03	14.78	0.02	0.44	0.90	0.80	0.00	0.00	
2-34	57.17	33.91	3.23	5.05	0.01	0.39	0.21	0.05	0.00	0.00	
4-23	63.37	30.50	0.36	5.62	0.00	0.09	0.00	0.07	0.00	0.00	
4-26	25.60	59.62	0.46	13.55	0.01	0.12	0.60	0.04	0.00	0.00	
4-31	54.00	32.08	0.06	12.62	1.11	0.04	0.04	0.04	0.00	0.00	
4-41	54.92	36.11	0.26	7.24	0.01	0.44	0.69	0.33	0.00	0.00	
4-47	46.83	40.93	0.11	10.32	0.15	0.47	1.09	0.11	0.00	0.00	
5-7	39.37	49.65	1.54	8.51	0.00	0.32	0.00	0.60	0.00	0.00	
5-47	55.05	39.71	1.71	2.30	0.02	0.15	0.93	0.13	0.00	0.00	
5-67	46.55	42.92	0.21	9.09	0.01	0.89	0.05	0.26	0.00	0.00	
5-68	57.68	32.51	0.13	7.11	0.01	0.20	2.33	0.04	0.00	0.00	
7-1	62.65	27.47	4.18	4.91	0.10	0.39	0.27	0.03	0.00	0.00	
7-14	54.74	35.89	0.32	8.69	0.02	0.12	0.00	0.23	0.00	0.00	
7-17	60.36	28.89	0.10	9.53	0.03	0.50	0.00	0.59	0.00	0.00	
7-41-1	58.04	35.45	0.08	6.04	0.00	0.24	0.00	0.15	0.00	0.00	
7-41-2	45.67	47.06	0.52	6.52	0.00	0.12	0.00	0.11	0.00	0.00	
7-62	51.80	38.57	0.03	9.54	0.00	0.05	0.00	0.00	0.00	0.00	
7-63	64.01	27.36	0.00	8.13	0.00	0.16	0.23	0.10	0.00	0.00	
7-88-1	56.36	34.22	0.54	8.30	0.02	0.54	0.00	0.02	0.00	0.00	
7-88-2	59.32	32.81	0.44	7.43	0.00	0.00	0.00	0.00	0.00	0.00	
7-90	53.03	36.58	0.41	9.92	0.00	0.04	0.02	0.01	0.00	0.00	
7-105	47.79	41.21	0.17	9.77	0.07	0.62	0.00	0.37	0.00	0.00	
7-118-1	47.18	42.77	0.16	9.79	0.00	0.09	0.00	0.01	0.00	0.00	
7-118-2	63.27	27.82	0.45	8.27	0.00	0.17	0.00	0.02	0.00	0.00	
7-139	64.96	23.80	0.41	10.61	0.00	0.19	0.00	0.04	0.00	0.00	
7-142	58.74	29.26	3.89	7.52	0.00	0.34	0.00	0.25	0.00	0.00	
Average	53.85	35.83	0.90	8.12	0.06	0.31	0.65	0.19	0.08	0.00	
2se	2.78	2.54	0.39	0.79	0.05	0.07	0.68	0.06	0.17	0.00	
Meteorites											
NWA 12008	46.46	30.17		4.26	13.77	0.07	0.30		0.16		4.81
NWA 14526	51.28	32.03		2.80	13.04	0.05	0.10		0.41		0.28

Table S3. Composition of sulfide in Chang'e-6 basalt clasts, highland clasts and breccias.

Samples		Fe	S	P ₂ O ₅	Cr	Ni	Cu	Zn	Co	Se	Total
		wt. %	wt. %	wt. %	wt. %	wt. %	wt. %	wt. %	wt. %	wt. %	
1-4Tro-1	Basalt	62.7	34.8	0.00	-		0.01	0.03	0.08	0.25	97.9
1-4Tro-2	Basalt	63.1	34.7	0.01	-		0.02	-	0.09	0.41	98.3
1-4Tro-3	Basalt	62.5	34.2	0.01	-		0.03	-	0.07	0.19	97.0
1-17-Tro1	Basalt	62.5	35.0	-	-		0.02	-	0.11	0.11	97.7
1-41-Tro1	Basalt	62.8	34.2	0.02	0.01	0.04	-	-	0.10	0.24	97.5
2-9-Tro1	Basalt	61.1	33.8	-	-		0.05	-	0.08		95.0
5-25-Tro1	Basalt	62.7	34.1	0.01	0.02		0.07	-	0.06	0.16	97.1
5-25-tro2	Basalt	63.5	34.6	0.00	0.00		0.02	0.00	0.08	0.01	98.3
1-3tro-3	Basalt	62.6	34.8	-	0.25		0.01	-	0.09	-	97.7
1-7tro-1	Basalt	62.7	34.5	0.01	0.06	0.01	0.01	-	0.05	0.38	97.6
1-4Tro-3	Basalt	61.9	35.0	0.01	0.02		0.01	0.04	0.06	0.05	97.2
1-4Tro-4	Basalt	63.0	35.2	0.00	-		0.03	-	0.06	0.10	98.4
1-20-Tro1	Basalt	63.4	35.2	-	-		-	-	0.05	0.22	98.9
1-20-Tro2	Basalt	63.3	35.0	-	0.00		-	0.03	0.10	0.21	98.6
1-41-Tro	Basalt	61.4	36.2	0.00	0.01		0.04	-	0.08	0.34	98.1
1-41-Tro1	Basalt	62.3	36.7	-	0.01		-	0.03	0.09	0.22	99.4
1-155-Tro	Basalt	62.2	35.9	-	-		-	0.01	0.07	-	98.2
2-1-Tro1	Basalt	62.6	35.6	-	0.01	0.03	-	0.05	0.07	0.45	98.8
2-1-Tro2	Basalt	61.5	36.0	0.00	0.02	-	0.05	-	0.09	0.18	97.9
2-1-Tro3	Basalt	62.9	36.2	0.00	0.04	-	0.03	-	0.06	0.30	99.5
2-14-Tro1	Basalt	63.4	36.1	-	-	-	-	-	0.07	0.23	99.8
2-14-Tro2	Basalt	62.7	35.0	0.01	-	0.01	-	-	0.07	-	97.8
4-20-Tro1	Basalt	62.3	35.3	0.00	0.01	0.02	0.05	0.02	0.03	-	97.7
4-20-Tro2	Basalt	63.1	35.4	-	0.02	-	0.02	0.02	0.04	0.09	98.8
4-32-Tro1	Basalt	62.8	35.8	-	-	-	0.59	-	0.03	-	99.2
7-86-Tro	Basalt	63.0	35.9	-	0.03	0.00	-	-	0.09	0.09	99.1
7-126-Tro1	Basalt	62.3	35.2	-	-	-	-	-	0.07	0.20	97.8
7-126-Tro2	Basalt	62.5	35.5	0.02	-	-	-	-	0.06	-	98.1
7-126-Tro3	Basalt	62.4	35.4	-	0.02	-	-	-	0.07	0.35	98.2
7-136-Tro1	Basalt	62.7	35.9	0.01	0.03	0.04	0.02	-	0.06	0.03	98.8
7-136-Tro2	Basalt	62.8	35.8	-	-	-	-	-	0.08	0.49	99.1
5-31tro-1	Highland	60.6	35.3	-	-	0.08	-	-	0.05	-	96.1
5-48-tro-1	Highland	61.5	34.7	0.01	0.01	0.07	-	0.02	0.05	0.17	96.5
5-48-tro2	Highland	62.3	34.4	0.00	-	0.30	0.05	-	0.09	0.16	97.3
4-28-Tro1	Highland	62.5	35.4	0.01	0.03	-	-	-	0.08	0.13	98.1
7-70-Tro	Highland	62.6	35.7	-	0.03	-	-	-	0.09	-	98.4
7-70-Tro2	Highland	61.5	35.7	-	0.04	0.98	0.05	-	0.12	0.23	98.6

1-2-Tro1	Breccia	65.0	29.1	-	0.09	1.08	0.10	-	0.15	0.11	95.6
1-144-Tro1	Breccia	60.8	36.2	0.01	0.01	0.71	-	-	0.17	0.32	98.2
1-21Tro-1	Breccia	63.0	34.7	-	0.04	-	-	-	0.07	0.66	98.4
1-21Tro-2	Breccia	62.6	34.5	-	0.02	-	0.06	-	0.08	0.58	97.8
1-36-Tro1	Breccia	62.6	34.5	-	0.00	-	0.05	-	0.06	0.34	97.5
1-36-Tro2	Breccia	62.4	34.3	-	-	-	0.05	-	0.05	0.22	97.0
1-132-Tro1	Breccia	63.3	35.6	0.01	-	-	-	-	0.09	0.09	99.0
1-167-Tro1	Breccia	62.3	36.2	0.00	0.01	-	-	-	0.07	0.17	98.7
1-167-Tro2	Breccia	63.1	36.5	-	0.05	-	0.04	-	0.02	0.18	99.9
1-104-Tro2	Breccia	61.2	35.0	-	0.02	-	0.03	-	0.07	-	96.3
1-104-Tro1	Breccia	62.6	36.4	0.00	0.01	0.01	0.07	0.03	0.08	0.07	99.2
2-15-Tro	Breccia	62.9	35.5	-	-	-	0.04	0.01	0.10	0.60	99.1
2-19-Tro1	Breccia	59.8	35.8	-	0.05	3.62	0.05	-	0.28	0.09	99.7
2-19-Tro2	Breccia	61.5	35.9	0.00	0.04	-	0.01	0.01	0.07	0.12	97.7
2-19-Tro3	Breccia	62.6	35.7	0.01	0.03	0.01	-	0.06	0.04	-	98.5
2-19-Tro5	Breccia	60.8	32.9	0.00	0.03	-	-	-	0.10	0.28	94.1
4-42-Tro1	Breccia	61.4	35.7	-	-	-	0.02	-	0.08	0.41	97.6
7-81-Tro	Breccia	61.5	35.5	0.00	0.01	-	-	0.03	0.08	0.07	97.2
7-84-Tro	Breccia	62.5	35.6	0.00	0.01	0.02	0.10	-	0.08	-	98.3
7-93-Tro	Breccia	62.4	35.7	0.00	0.02	-	-	0.05	0.08	0.29	98.5
7-49-Tro	Breccia	62.3	35.9	-	0.02	-	0.00	-	0.08	-	98.3

Table S4. $\delta^{34}\text{S}_{\text{V-CDT}}$ value of troilites in CE-6 basalt clasts, breccias and highland clasts, and lunar meteorites NWA 14526 and NWA 12008.

Samples		$\delta^{34}\text{S}_{\text{V-CDT}}(\text{‰})$	2SE	Mg# _{Py}	
2-14-1	Basalt	1.37	0.29	35.7	
2-14-2	Basalt	1.07	0.25	35.7	
4-32-1	Basalt	0.41	0.27	3.3	
4-53-1	Basalt	0.77	0.32	43.9	
7-86-1	Basalt	0.83	0.25		
7-86-2	Basalt	0.83	0.36		
7-140-1	Basalt	0.48	0.36		
5-63-1	Basalt	1.07	0.15		
5-67-1	Basalt	1.52	0.37	7.0	
5-67-2	Basalt	0.81	0.65	7.0	
5-70-1	Basalt	1.22	0.18		
1-4-1	Basalt	0.41	0.69	1.1	
1-4-2	Basalt	0.65	0.36	1.1	
1-20-1	Basalt	0.70	0.35	15.0	
1-20-2	Basalt	0.30	0.51	15.0	
1-41-1	Basalt	1.19	0.24	2.5	
1-155-1	Basalt	0.47	0.20	0.5	
		0.83	0.16		
5-25-1	Basalt	2.32	0.47	17.5	Hosted by fractured clast
5-25-2	Basalt	1.30	0.24	17.5	
4-28-1	Mg-suite	1.14	0.60	77.0	
5-48-1	FAN	0.94	0.62	60.0	
2-13-1	Breccia	0.47	0.37		
2-19-1	Breccia	1.86	0.50		
2-19-2	Breccia	2.19	0.48		
2-19-3	Breccia	1.70	0.91		
4-42-1	Breccia	0.30	0.40		
7-49-1	Breccia	0.72	0.39		
7-81-1	Breccia	0.86	0.27		
7-84-1	Breccia	1.85	0.25		
7-93-1	Breccia	1.13	0.34		
1-21-1	Breccia	1.15	0.18		
1-36-1	Breccia	0.89	0.32		
1-36-2	Breccia	1.24	0.33		
1-132-1	Breccia	0.98	0.16		
1-167-1	Breccia	2.04	0.40		
		1.24	0.31		

14526-2	Low-Ti basalt	1.10	0.15
14526-3	Low-Ti basalt	0.84	0.14
14526-4	Low-Ti basalt	0.62	0.12
14526-5	Low-Ti basalt	0.94	0.19
14526-5	Low-Ti basalt	0.94	0.20
14526-6	Low-Ti basalt	0.92	0.14
14526-7	Low-Ti basalt	1.30	0.14
14526-8	Low-Ti basalt	0.49	0.15
14526-9	Low-Ti basalt	0.91	0.18
14526-10	Low-Ti basalt	0.32	0.17
		0.84	0.17
12008-1	Low-Ti basalt	1.17	0.63
12008-2	Low-Ti basalt	0.01	0.38
12008-3	Low-Ti basalt	0.43	0.47
12008-4	Low-Ti basalt	-0.09	0.31
12008-5	Low-Ti basalt	0.27	0.47
12008-7	Low-Ti basalt	-0.09	0.48
12008-9	Low-Ti basalt	0.35	0.35
		0.29	0.31

Table S5. 34SV-CDT value of reference materials.

Sample Name	$\delta^{34}\text{S}_{\text{V-CDT}}$ (‰)	2SE
PPP-1	5.32	0.09
PPP-1	5.49	0.10
PPP-1	5.39	0.09
PPP-1	5.54	0.09
PPP-1	5.34	0.10
PPP-1	5.47	0.10
PPP-1	5.42	0.10
PPP-1	5.41	0.11
PPP-1	5.28	0.11
PPP-1	5.35	0.08
PPP-1	5.35	0.10
PPP-1	5.39	0.10
PPP-1	5.52	0.09
PPP-1	5.55	0.09
PPP-1	5.34	0.10
PPP-1	5.45	0.09
PPP-1	5.29	0.09
PPP-1	5.33	0.09
PPP-1	5.40	0.08
PPP-1	5.43	0.10
PPP-1	5.69	0.09
PPP-1	5.23	0.09
PPP-1	5.48	0.10
PPP-1	5.34	0.10
PPP-1	5.26	0.11
PPP-1	5.38	0.08
PPP-1	5.41	0.09
PPP-1	5.56	0.10
PPP-1	5.50	0.11
PPP-1	5.26	0.09
PPP-1	5.29	0.10
PPP-1	5.45	0.10
PPP-1	5.45	0.10
PPP-1	5.35	0.09
PPP-1	5.32	0.09
PPP-1	5.44	0.09
PPP-1	5.31	0.08
PPP-1	5.51	0.08

PPP-1	5.29	0.08
PPP-1	5.57	0.08
PPP-1	5.37	0.08
PPP-1	5.49	0.08
PPP-1	5.47	0.09
PPP-1	5.43	0.10
PPP-1	5.31	0.10
PPP-1	5.37	0.09
PPP-1	5.45	0.09
PPP-1	5.58	0.10
PPP-1	5.46	0.10
PPP-1	5.35	0.08
PPP-1	5.39	0.09
PPP-1	5.41	0.09
	5.41	0.19
YP136	1.28	0.15
YP136	1.71	0.15
YP136	1.74	0.14
YP136	1.74	0.14
YP136	1.65	0.15
YP136	1.55	0.13
YP136	1.12	0.12
YP136	1.29	0.13
YP136	1.29	0.15
YP136	1.22	0.13
	1.46	0.48
MUON	-0.18	0.17
MUON	0.39	0.13
MUON	-0.25	0.15
MUON	0.41	0.14
MUON	0.13	0.13
MUON	0.26	0.13
MUON	0.00	0.17
MUON	0.40	0.23
MUON	0.11	0.13
MUON	-0.05	0.15
	0.12	0.48
NWA 859	0.31	0.15
NWA 859	0.73	0.14
NWA 859	0.38	0.17

NWA 859	0.92	0.13
NWA 859	0.67	0.17
NWA 859	0.65	0.19
NWA 859	0.20	0.16
NWA 859	0.15	0.14
NWA 859	0.48	0.13
NWA 859	0.40	0.17
	0.49	0.50

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