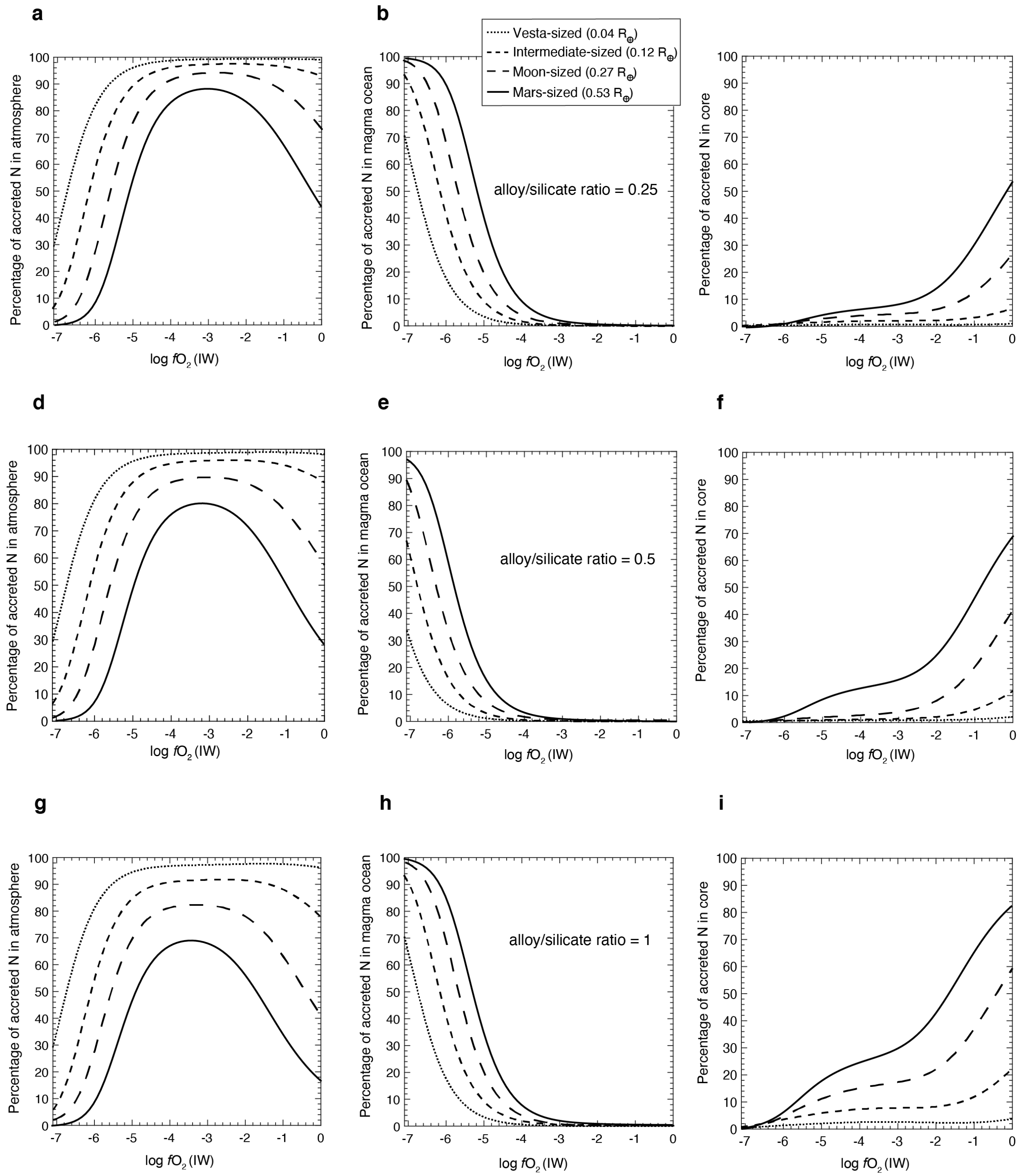
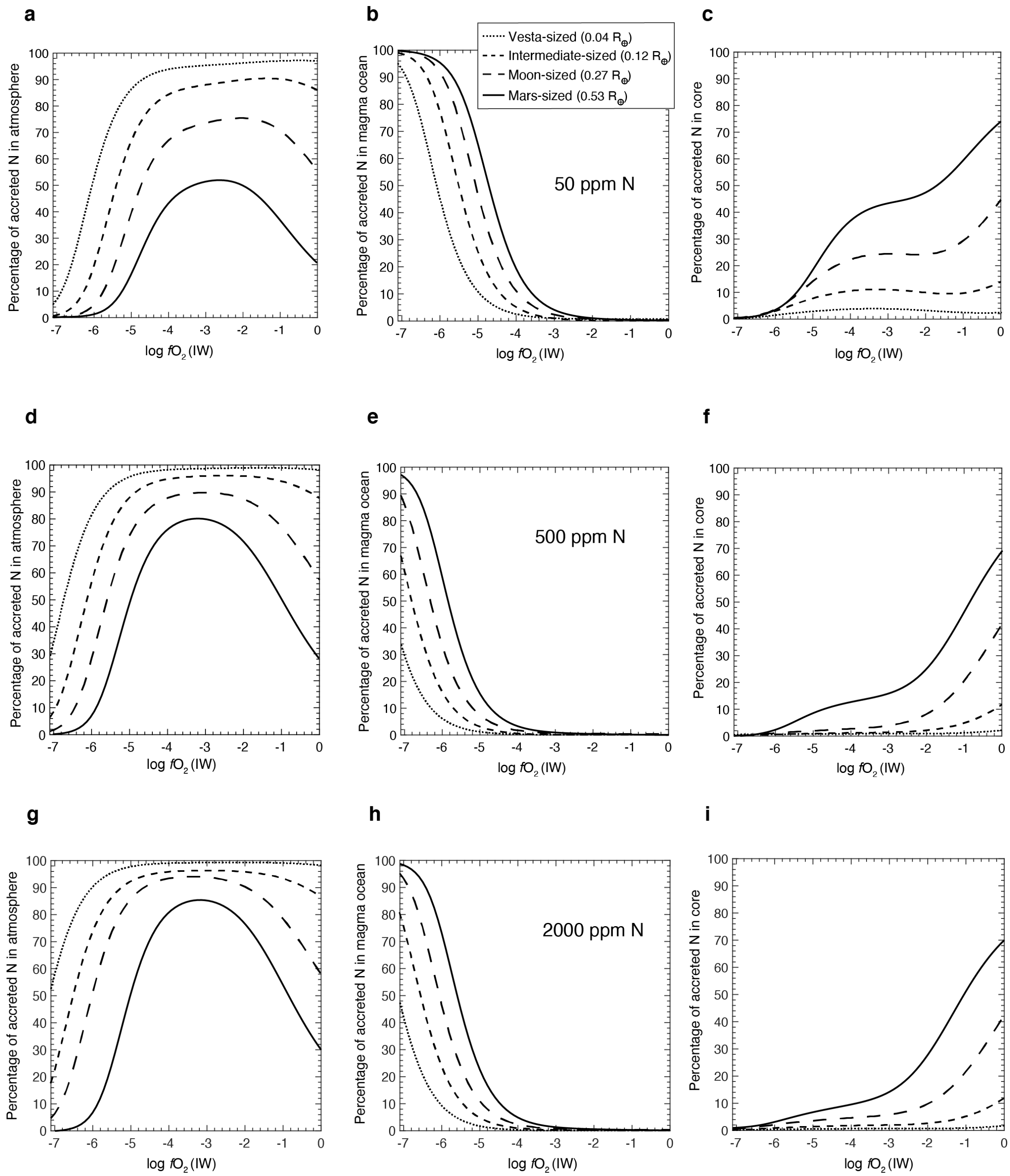
Supplementary Figures:

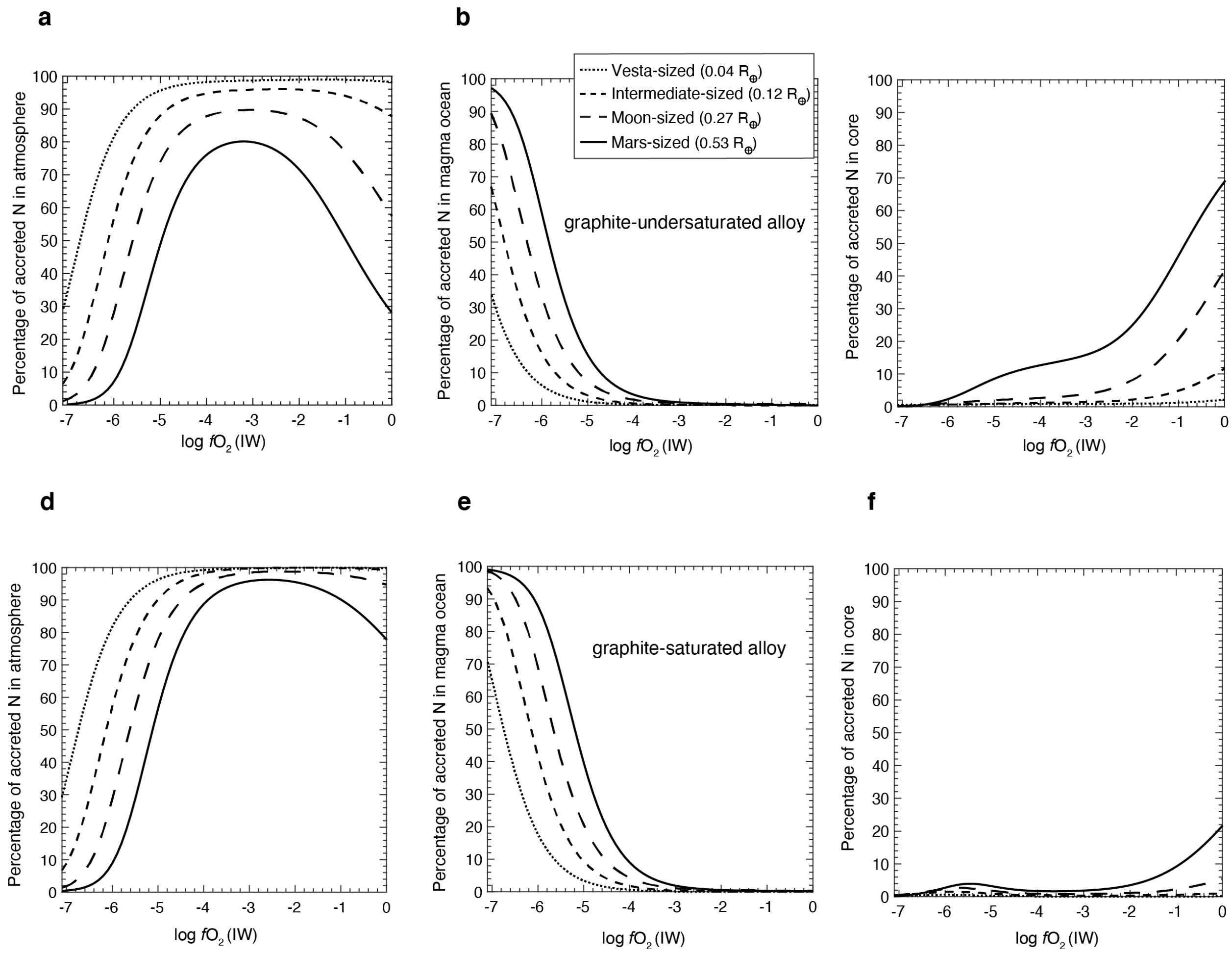


Supplementary Figure 1: Sensitivity analysis of the relative distribution of nitrogen in the atmosphere, magma ocean, and core with variation in alloy/silicate ratio (= 0.25: a), b), and

c); = 0.5: d), e), and f); = 1: g), h), and i)). This figure shows that the results of Fig. 3 (panels **d)**, **e)** and **f)** in this figure) hold true independent of the variation of the core/mantle ratio or the efficiency of alloy-silicate equilibration. A bulk accreted N of 500 ppm and alloys containing 0.4 wt.% C are used for these calculations.



Supplementary Figure 2: Sensitivity analysis of the relative distribution of nitrogen in the atmosphere, magma ocean, and core with variation in initial abundances of accreted N (= 50 ppm: a), b), and c); = 500 ppm: d), e), and f); = 2000 ppm: g), h), and i)). This figure shows that the results of Fig. 3 (panels **d)**, **e)** and **f)** in this figure) hold true independent of the variation of initial amount of N that was accreted. An alloy/silicate ratio of 0.5 and alloys containing 0.4 wt.% C are used for these calculations.



Supplementary Figure 3: Comparison of the relative distribution of nitrogen in the atmosphere, magma ocean, and core for graphite-undersaturated and graphite-saturated alloys. Determining $D_{\mathrm{N}}^{\mathrm{alloy/silicate}}$ in C-understated alloys (**a**), **b)** and **c)**) was critical for the conclusions drawn in this study as for C-saturated alloys (**d**), **e)** and **f)**) there would be minimal segregation of N into the core of even larger planetary embryos, which would mean that for core-mantle differentiation at log$f$$O_2$>IW–4, N degassing into the atmosphere would be the primary cause of N depletion in magma oceans of rocky bodies irrespective of their sizes. For calculations involving C-undersaturated alloys, C content of the alloy was fixed at 0.4 wt.%. A bulk accreted N of 500 ppm and an alloy/silicate ratio of 0.5 is used for these calculations.

Supplementary Table 1. Chemical compositions of starting materials (in wt.%)

Silicate Mix	SiO_2	Al_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Sum	NBO/T
ThB1	51.19	16.12	0.03	9.18	0.23	8.75	11.35	3.05	0.10	100.00	0.76

Alloy mix	Fe	Ni	N	Si	Sum
Fe-5Ni-5N-0Si	90	5	5	0	100
Fe-5Ni-5N-7.5Si	82.5	5	5	7.5	100
Fe-5Ni-5N-12.5Si	77.5	5	5	12.5	100
Fe-5Ni-5N-17.5Si	72.5	5	5	17.5	100
Fe-5Ni-5N-22.5Si	67.5	5	5	22.5	100
Fe-5Ni-5N-27.5Si	62.5	5	5	27.5	100
Fe-5Ni-5N-32.5Si	57.5	5	5	32.5	100
Fe-5Ni-5N-37.5Si	52.5	5	5	37.5	100

Supplementary Table 2. Summary of experimental conditions, quench products, oxygen fugacity, and alloy-silicate partitioning coefficient of nitrogen (N)

Exp Samples	*P* (GPa)	*T* (°C)	[a]Duration (h)	Capsule	[b]Starting composition	Quench Products	[c]log fO_2 (ΔIW) Ideal	[d]log fO_2 (ΔIW) Non-ideal	$D_N^{alloy/silicate}$	[e]1-σ
G604	3	1800	0.75	MgO	70%ThB1+30%Fe-5Ni-5N-37.5Si	Periclase+Glass+Alloy	-8.27	-7.10	0.01	0.00
G605	3	1700	1	MgO	70%ThB1+30%Fe-5Ni-5N-37.5Si	Periclase+Glass+Alloy	-8.30	-7.06	0.01	0.00
G606	3	1600	3	MgO	70%ThB1+30%Fe-5Ni-5N-37.5Si	Periclase+Glass+Alloy	-8.10	-6.92	0.01	0.00
G607	3	1800	1	MgO	70%ThB1+30%Fe-5Ni-5N-32.5Si	Periclase+Glass+Alloy	-6.68	-5.83	0.02	0.01
G608	3	1700	1.5	MgO	70%ThB1+30%Fe-5Ni-5N-32.5Si	Periclase+Olivine+Glass+Alloy	-6.62	-5.72	0.02	0.00
G609	3	1600	2	MgO	70%ThB1+30%Fe-5Ni-5N-32.5Si	Periclase+Glass+Alloy	-6.65	-5.59	0.02	0.01
G610	3	1800	0.75	MgO	70%ThB1+30%Fe-5Ni-5N-27.5Si	Periclase+Olivine+Glass+Alloy	-5.41	-4.87	0.07	0.04
B466	3	1600	2	MgO	70%ThB1+30%Fe-5Ni-5N-27.5Si	Periclase+Glass+Alloy	-5.42	-4.82	0.09	0.04
G613	3	1800	2	MgO	70%ThB1+30%Fe-5Ni-5N-22.5Si	Periclase+Glass+Alloy	-4.69	-4.26	0.27	0.03
G614	3	1700	2	MgO	70%ThB1+30%Fe-5Ni-5N-22.5Si	Periclase+Glass+Alloy	-4.66	-4.23	0.42	0.07
B467	3	1600	1.5	MgO	70%ThB1+30%Fe-5Ni-5N-22.5Si	Periclase+Glass+Alloy	-4.55	-4.11	0.30	0.04
X43	3	1800	1	MgO	70%ThB1+30%Fe-5Ni-5N-17.5Si	Periclase+Olivine+Glass+Alloy	-4.60	-4.22	1.24	0.18
X39	3	1700	2	MgO	70%ThB1+30%Fe-5Ni-5N-17.5Si	Periclase+Dendrite+Glass+Alloy	-4.98	-4.60	1.41	0.21
X63	3	1600	0.5	MgO	70%ThB1+30%Fe-5Ni-5N-17.5Si	Periclase+Dendrite+Glass+Alloy	-4.68	-4.37	1.28	0.08
G634	3	1600	2	MgO	70%ThB1+30%Fe-5Ni-5N-17.5Si	Periclase+Dendrite+Glass+Alloy	-4.42	-4.12	1.44	0.08
X74	3	1600	6	MgO	70%ThB1+30%Fe-5Ni-5N-17.5Si	Periclase+Dendrite+Glass+Alloy	-4.64	-4.31	1.45	0.09
G639	3	1600	12	MgO	70%ThB1+30%Fe-5Ni-5N-17.5Si	Periclase+Dendrite+Glass+Alloy	-4.72	-4.42	1.53	0.08
G603	3	1800	1.5	MgO	70%ThB1+30%Fe-5Ni-5N-12.5Si	Periclase+Dendrite+Glass+Alloy	-4.54	-4.17	3.12	0.17
X29	3	1700	2	MgO	70%ThB1+30%Fe-5Ni-5N-12.5Si	Periclase+Dendrite+Glass+Alloy	-4.38	-4.01	3.22	0.28
X25	3	1600	3	MgO	70%ThB1+30%Fe-5Ni-5N-12.5Si	Periclase+Dendrite+Glass+Alloy	-3.88	-3.51	4.44	0.89
G620	3	1800	1.5	MgO	70%ThB1+30%Fe-5Ni-5N-7.5Si	Periclase+Dendrite+Glass+Alloy	-2.66	-2.27	26.41	7.88
X50	3	1700	1.5	MgO	70%ThB1+30%Fe-5Ni-5N-7.5Si	Periclase+Dendrite+Glass+Alloy	-2.98	-2.60	20.53	4.34
G621	3	1600	2	MgO	70%ThB1+30%Fe-5Ni-5N-7.5Si	Periclase+Dendrite+Glass+Alloy	-2.78	-2.43	24.55	6.55
X47	3	1800	0.75	MgO	70%ThB1+30%Fe-5Ni-5N-0Si	Periclase+Dendrite+Glass+Alloy	-1.91	-1.54	93.68	30.98
G623	3	1700	1	MgO	70%ThB1+30%Fe-5Ni-5N-0Si	Periclase+Dendrite+Glass+Alloy	-2.11	-1.63	93.48	32.92
X48	3	1600	3	MgO	70%ThB1+30%Fe-5Ni-5N-0Si	Periclase+Dendrite+Glass+Alloy	-2.32	-1.96	116.50	38.90

[a]The experiments were held at 850-900 °C for 2–12 h before raising to the target temperature in order to reduce the porosity of MgO capsules and prevent the leakage of silicate melt and alloy melt
[b]For details see Table S1
[c] fO_2 with respect to iron-wüstite buffer (IW) calculated using ideal solution model for both alloy and silicate melts
[d] fO_2 with respect to iron-wüstite buffer (IW) calculated using non-ideal solution model for both alloy and silicate melts (see text for details)
fO_2 calculations are made using the average FeO* and Fe contents of silicate melts and alloys, respectively
[e]1-σ error for $D_N^{alloy/silicate}$ is obtained by propagating 1-σ deviation error on N content in the alloy and silicate melt
Matte = Silicate melt domain that quenched to an aggregate of dendritic crystals

Supplementary Table 3. The major element compositions (in wt.%) of the silicate melts

Exp Samples	*n*	SiO_2	SiO_2-corr	Al_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	BaO	N	Total	Total-corr	[a]NBO/T	[b]SiO/SiO_2-corr
G604	20	48.88	46.44	14.96	0.00	0.01	0.03	24.80	12.62	2.57	0.09	1.34	1.42	106.72	104.28	1.38	0.44
1-σ		0.37	0.37	0.14	0.00	0.01	0.01	0.63	0.24	0.06	0.01	0.04	0.08	0.19	0.19	0.01	
G605	20	49.65	46.36	16.15	0.00	0.01	0.02	25.53	11.64	2.29	0.08	0.51	1.92	107.80	104.51	1.34	0.48
1-σ		0.17	0.17	0.15	0.00	0.01	0.01	0.25	0.13	0.04	0.01	0.04	0.13	0.35	0.35	0.00	
G606	19	48.76	45.70	16.76	0.00	0.01	0.05	25.93	11.41	2.39	0.11	0.46	1.79	107.67	104.60	1.34	0.51
1-σ		0.15	0.15	0.09	0.01	0.03	0.01	0.11	0.09	0.04	0.00	0.06	0.06	0.29	0.29	0.01	
G607	20	45.39	42.98	13.55	0.01	0.04	0.05	29.63	11.22	2.28	0.08	2.30	1.41	105.96	103.54	1.73	0.37
1-σ		0.18	0.18	0.06	0.01	0.01	0.01	0.11	0.15	0.02	0.00	0.06	0.18	0.30	0.30	0.01	
G608	20	51.89	49.53	13.91	0.01	0.04	0.09	25.40	10.47	1.98	0.08	0.78	1.37	106.01	103.65	1.28	0.31
1-σ		0.37	0.37	0.11	0.00	0.01	0.02	0.19	0.05	0.03	0.01	0.16	0.03	0.32	0.32	0.01	
G609	18	49.11	46.32	16.42	0.01	0.04	0.11	24.79	10.72	2.62	0.10	0.86	1.63	106.41	103.63	1.46	0.34
1-σ		0.37	0.37	0.12	0.01	0.01	0.00	0.22	0.05	0.06	0.01	0.30	0.08	0.13	0.13	0.01	
G610	20	50.95	49.08	13.87	0.01	0.21	0.15	26.03	10.61	2.02	0.08	0.15	1.09	105.14	103.27	1.32	0.27
1-σ		0.25	0.25	0.15	0.01	0.05	0.01	0.12	0.06	0.04	0.01	0.02	0.03	0.19	0.19	0.01	
B466	20	49.45	47.29	15.26	0.01	0.19	0.15	23.00	12.56	2.79	0.10	1.07	1.26	105.84	103.69	1.27	0.34
1-σ		0.39	0.39	0.48	0.01	0.02	0.01	0.13	0.07	0.10	0.01	0.25	0.07	0.19	0.19	0.01	
G613	20	49.49	47.65	17.05	0.01	0.47	0.21	23.22	11.03	2.62	0.11	0.03	1.07	105.30	103.46	1.15	0.31
1-σ		0.06	0.06	0.08	0.01	0.01	0.01	0.06	0.05	0.03	0.01	0.02	0.11	0.03	0.03	0.00	
G614	20	48.34	46.85	14.66	0.00	0.49	0.17	21.30	11.46	2.27	0.09	4.75	0.87	104.40	102.92	1.31	0.25
1-σ		0.27	0.27	0.05	0.00	0.02	0.02	0.20	0.08	0.02	0.01	0.09	0.06	0.14	0.14	0.01	
B467	20	50.23	48.55	14.33	0.00	0.58	0.17	24.07	10.85	1.97	0.08	0.96	0.98	104.22	102.54	1.27	0.20
1-σ		0.64	0.64	0.10	0.01	0.02	0.02	0.33	0.14	0.06	0.01	0.04	0.05	0.89	0.89	0.02	
X43	20	43.11	41.53	14.84	0.01	0.59	0.15	28.36	11.42	2.06	0.05	2.69	0.92	104.22	102.63	1.70	0.25
1-σ		0.42	0.42	0.22	0.01	0.03	0.01	0.98	0.37	0.09	0.01	0.19	0.10	0.30	0.30	0.01	
X39	17	47.70	46.37	15.86	0.01	0.36	0.18	19.86	12.78	2.76	0.11	3.88	0.78	104.29	102.96	1.74	0.26
1-σ		0.37	0.37	0.15	0.01	0.02	0.02	0.28	0.09	0.07	0.00	0.22	0.11	0.46	0.46	0.01	
X63	10	47.39	44.52	16.53	0.01	0.56	0.17	25.71	10.73	2.36	0.10	0.18	0.91	104.53	101.67	1.29	0.25
1-σ		0.20	0.20	0.18	0.01	0.02	0.01	0.32	0.08	0.01	0.01	0.05	0.11	0.32	0.32	0.01	
G634	10	46.78	44.61	17.86	0.01	0.72	0.21	24.13	10.12	3.93	0.15	0.07	0.85	104.73	102.56	1.21	0.24
1-σ		0.17	0.17	0.13	0.01	0.11	0.01	0.12	0.06	0.00	0.04	0.01	0.10	0.21	0.21	0.01	
X74	10	46.35	43.84	16.07	0.00	0.55	0.18	21.08	11.88	3.11	0.08	2.48	0.94	102.63	100.12	1.25	0.20
1-σ		0.45	0.45	0.62	0.01	0.02	0.01	0.52	0.09	0.00	0.01	0.10	0.10	0.40	0.40	0.00	
G639	10	45.94	42.91	16.03	0.01	0.51	0.17	23.80	10.54	3.57	0.09	1.08	0.82	102.45	99.42	1.31	0.19
1-σ		0.41	0.41	0.25	0.01	0.07	0.01	0.33	0.16	0.01	0.01	0.06	0.10	0.35	0.35	0.02	
G603	20	43.06	41.80	15.08	0.00	0.59	0.16	24.24	12.94	2.51	0.09	3.87	0.73	103.27	102.01	1.62	0.18
1-σ		0.18	0.18	0.18	0.00	0.02	0.01	0.51	0.22	0.04	0.01	0.14	0.01	0.39	0.39	0.02	
X29	20	46.24	45.14	14.63	0.00	0.73	0.17	25.46	11.25	2.15	0.08	2.41	0.64	103.77	102.67	1.48	0.23
1-σ		0.16	0.16	0.11	0.00	0.03	0.01	0.24	0.13	0.04	0.01	0.09	0.03	0.32	0.32	0.01	
X25	20	44.96	44.23	14.79	0.01	1.14	0.14	26.09	8.03	1.76	0.08	5.43	0.42	102.90	102.17	1.51	0.18

1-σ		0.55	0.55	0.16	0.01	0.06	0.01	0.26	0.11	0.06	0.01	0.22	0.08	0.19	0.19	0.02	
G620	20	42.47	42.28	12.68	0.01	4.55	0.19	20.34	14.54	2.57	0.12	3.75	0.11	101.34	101.15	1.83	n.a.
1-σ		1.15	1.15	0.80	0.01	0.40	0.01	4.46	1.56	0.22	0.01	3.32	0.03	0.50	0.50	0.01	
X50	20	43.28	43.04	14.84	0.01	3.40	0.19	20.97	14.41	2.63	0.08	1.75	0.14	101.69	101.45	1.49	n.a.
1-σ		0.06	0.06	0.35	0.00	0.03	0.02	1.10	0.62	0.16	0.01	0.11	0.03	0.14	0.14	0.01	
G621	16	44.82	44.64	15.63	0.01	4.06	0.19	19.65	11.70	2.36	0.10	2.72	0.10	101.34	101.16	1.31	n.a.
1-σ		0.23	0.23	0.05	0.01	0.06	0.02	0.26	0.09	0.08	0.00	0.12	0.03	0.16	0.16	0.01	
X47	20	41.55	41.48	16.50	0.01	9.86	0.17	14.67	11.62	2.63	0.24	1.35	0.04	98.65	98.58	1.41	n.a.
1-σ		1.19	1.19	1.66	0.01	1.23	0.01	1.34	1.51	0.88	0.03	0.52	0.01	0.87	0.87	0.01	
G623	20	42.96	42.90	14.59	0.01	8.20	0.17	19.13	15.09	1.05	0.09	0.32	0.03	101.65	101.59	1.48	n.a.
1-σ		0.49	0.49	0.34	0.01	0.74	0.02	0.93	0.68	0.16	0.05	0.16	0.01	0.73	0.73	0.01	
X48	20	43.99	43.93	13.04	0.00	6.83	0.18	16.69	14.66	2.87	0.10	0.33	0.03	98.72	98.67	1.41	n.a.
1-σ		0.27	0.27	0.12	0.00	0.03	0.01	0.20	0.02	0.13	0.01	0.05	0.01	0.07	0.07	0.01	

[a]NBO/T = (2×Total O)/T - 4, where T = Si + Ti + Al + Cr + P

NBO/T calculations are made using the average oxide composition of silicate melts. 1-σ standard deviations are based on replicate EPMA analyses.

n represents the number of obtained measurements that were averaged for the reported data

[b]SiO/SiO_2-corr = possible ratio of SiO to SiO_2-corr to obtain a total of 100

n.a. = not applicable

Supplementary Table 4: Major element compositions (in wt.%) of the alloy melts

Exp Samples	*n*	Fe	Ni	Si	N	C	O	Total
G604	20	71.32	5.15	23.78	0.010	0.28	0.30	100.85
1-σ		0.37	0.54	0.21	0.005	0.04	0.06	0.21
G605	20	70.41	5.16	24.05	0.011	0.38	0.29	100.29
1-σ		0.56	0.18	0.04	0.007	0.08	0.03	0.56
G606	20	69.76	5.06	24.60	0.013	0.22	0.26	99.94
1-σ		0.38	0.20	0.26	0.006	0.03	0.05	0.49
G607	20	77.18	4.93	17.46	0.031	0.59	0.33	100.52
1-σ		0.38	0.07	0.14	0.006	0.11	0.03	0.35
G608	16	73.77	4.55	21.22	0.032	0.18	0.25	100.00
1-σ		0.47	0.08	0.11	0.004	0.02	0.03	0.37
G609	20	75.05	4.64	21.29	0.038	0.14	0.22	101.38
1-σ		0.15	0.05	0.11	0.013	0.06	0.07	0.14
G610	20	83.93	4.74	10.19	0.081	0.14	0.35	99.44
1-σ		0.64	0.08	0.17	0.046	0.05	0.09	0.73
B466	20	84.16	4.78	10.12	0.117	0.58	0.63	100.39
1-σ		0.43	0.07	0.19	0.046	0.08	0.05	0.46
G613	20	86.59	5.18	5.68	0.293	0.17	0.34	98.25
1-σ		0.58	0.08	0.05	0.015	0.03	0.04	0.61
G614	20	86.33	5.41	5.36	0.365	0.41	0.51	98.37
1-σ		0.67	0.07	0.25	0.054	0.05	0.08	0.34
B467	20	87.57	5.22	5.72	0.292	0.41	0.55	99.76
1-σ		0.63	0.14	0.14	0.035	0.03	0.03	0.61
X43	20	90.12	5.17	1.61	1.142	0.34	0.11	98.50
1-σ		0.59	0.08	0.18	0.111	0.02	0.02	0.44
X39	20	90.71	5.32	1.39	1.102	0.26	0.29	99.06
1-σ		0.30	0.09	0.12	0.063	0.04	0.03	0.32
X63	10	92.85	5.50	2.06	1.16	0.43	0.11	102.11
1-σ		0.22	0.05	0.08	0.06	0.02	0.04	0.25
G634	10	91.60	5.42	2.07	1.23	0.45	0.15	100.93
1-σ		0.61	0.16	0.01	0.04	0.15	0.02	0.87
X74	10	92.33	4.62	0.48	1.36	0.44	0.06	99.28
1-σ		0.39	0.13	0.29	0.11	0.03	0.04	0.40
G639	10	92.33	5.03	1.51	1.26	0.61	0.13	100.87
1-σ		0.43	0.12	0.01	0.08	0.04	0.02	0.41
G603	20	88.68	5.95	0.39	2.288	0.42	0.30	98.03
1-σ		0.47	0.09	0.06	0.117	0.05	0.02	0.43
X29	20	89.91	6.04	0.50	2.070	0.26	0.19	98.98
1-σ		0.69	0.07	0.05	0.143	0.04	0.04	0.67
X25	20	88.72	6.05	0.61	1.888	0.26	0.42	97.96
1-σ		0.40	0.11	0.09	0.091	0.03	0.11	0.37
G620	20	89.03	4.91	0.01	2.879	0.68	0.13	97.64
1-σ		0.28	0.26	0.01	0.041	0.04	0.09	0.31
X50	20	89.95	4.61	0.02	2.924	0.41	0.20	98.11
1-σ		0.43	0.12	0.02	0.057	0.03	0.05	0.41
G621	20	90.00	4.70	0.04	2.526	0.80	0.87	98.94
1-σ		0.58	0.09	0.01	0.124	0.05	0.04	0.49
X47	18	88.60	4.59	0.00	3.827	0.42	0.27	97.72
1-σ		0.39	0.13	0.00	0.055	0.06	0.04	0.31
G623	20	87.69	5.94	0.00	3.191	0.29	0.19	97.31
1-σ		0.42	0.17	0.00	0.068	0.11	0.04	0.35
X48	20	89.11	4.73	0.00	3.495	0.11	0.21	97.65
1-σ		0.52	0.19	0.01	0.069	0.02	0.05	0.44

n represents the number of obtained measurements that were averaged for the reported data

Supplementary Table 5. Coefficients of regression for $D_N^{alloy/silicate}$ parameterization

Parameters	Coefficients	1-σ
a	7775.00	5227.37
b	9325.77	2602.79
c	343.55	159.81
d	-37.66	17.91
e	-0.11	0.05
f	-3790.92	2313.83
g	419.53	253.26
h	0.69	0.35
i	1.43	0.17

Supplementary Table 6. Oxygen fugacity of core-mantle differentiation of rocky bodies

Rocky body	fO_2 (IW)	Methodology	Reference
Mercury	IW−7 to IW−5	MESSENGER data + melting experiments	Refs.[1,2]
Aubrite parent body	IW−7 to IW−5	Depletion of moderately siderophile elements in aubrites	Ref.[3]
IAB-MG, IIE irons	IW−4 to IW−2	Metal-olivine-orthopyroxene equilibria	Ref.[4]
Ureilites	IW−3 to IW−1	Cr valencies in ureilite olivine	Ref.[5]
Earth	IW−5 to IW−2	Oxidation of Earth's primitive upper mantle + Depletion of moderately siderophile elements in mantle	Ref.[6,7]
Mars	IW−2 to IW−1	Depletion of moderately siderophile elements in SNCs	Ref.[8]
Vesta	IW−2 to IW−1	Depletion of moderately siderophile elements in HEDs	Ref.[9]
Venus	IW−2 to IW (?)	Core and mantle compositions along a distance vector from Mercury to Earth	Ref.[10]
Angrite parent body	IW−2 to IW−1	Depletion of moderately siderophile elements in angrites	Ref.[11]

Supplementary Table 7. Physical parameters of rocky bodies

Rocky body	Surface area (km^2)	Mass (kg)	g (ms^{-2})
Vesta	8.00E+05	2.60E+20	0.22
Intermediate	7.13E+06	5.97E+21	0.70
Moon	3.80E+07	7.35E+22	1.62
Mars	1.45E+08	6.39E+23	3.71
Earth	5.10E+08	5.97E+24	9.81

Data for Solar System bodies is compiled from
https://nssdc.gsfc.nasa.gov/planetary/factsheet/planet_table_ratio.html

Supplementary References

1. Nittler, L. R., Chabot, N. L., Grove, T. L. & Peplowski, P. N. The Chemical Composition of Mercury. in *Mercury The View after MESSENGER* (ed. Sean C. Solomon , Larry R. Nittler, B. J. A.) 30–51 (Cambridge University Press, 2019).
2. Namur, O., Charlier, B., Holtz, F., Cartier, C. & McCammon, C. Sulfur solubility in reduced mafic silicate melts: Implications for the speciation and distribution of sulfur on Mercury. *Earth Planet. Sci. Lett.* (2016). doi:10.1016/j.epsl.2016.05.024
3. Casanova, I., Keil, K. & Newsom, H. E. Composition of metal in aubrites: Constraints on core formation. *Geochim. Cosmochim. Acta* **57**, 675–682 (1993).
4. Righter, K. & Drake, M. J. Core Formation in Earth's Moon, Mars, and Vesta. *Icarus* **124**, 513–529 (1996).
5. Goodrich, C. A., Sutton, S. R., Wirick, S. & Jercinovic, M. J. Chromium valences in ureilite olivine and implications for ureilite petrogenesis. *Geochim. Cosmochim. Acta* **122**, 280–305 (2013).
6. Wade, J. & Wood, B. J. Core formation and the oxidation state of the Earth. *Earth Planet. Sci. Lett.* **236**, 78–95 (2005).
7. Rubie, D. C. *et al.* Accretion and differentiation of the terrestrial planets with implications for the compositions of early-formed Solar System bodies and accretion of water. *Icarus* **248**, 89–108 (2015).
8. Rai, N. & Van Westrenen, W. Core-mantle differentiation in Mars. *J. Geophys. Res. E Planets* **118**, 1195–1203 (2013).
9. Steenstra, E. S., Knibbe, J. S., Rai, N. & van Westrenen, W. Constraints on core formation in Vesta from metal–silicate partitioning of siderophile elements. *Geochim. Cosmochim. Acta* **177**, 48–61 (2016).
10. Trønnes, R. G. *et al.* Core formation, mantle differentiation and core-mantle interaction within Earth and the terrestrial planets. *Tectonophysics* **760**, 165–198 (2019).
11. Steenstra, E. S. *et al.* The effect of melt composition on metal-silicate partitioning of siderophile elements and constraints on core formation in the angrite parent body. *Geochim. Cosmochim. Acta* **212**, 62–83 (2017).