Supplementary Tables

Table S1. Chemical composition of Zn sulfides of the Irinovskoe HSF, wt%.

Figure no.	Analysis no.	Zn	Fe	Cd	Cu	Ag	Pb	S	Total	FeS, mol%	Formula
Wurtzite											
S1-1	29016h	56.82	9.61	0.75				32.59	99.77	8.33	$(Zn_{0.86}Fe_{0.17}Cd_{0.01})_{1.03}S_{1.00}$
	29016i	53.55	11.70	0.83				33.09	99.17	10.13	$(Zn_{0.79}Fe_{0.20}Cd_{0.01})_{1.00}S_{1.00}$
	29016j	54.67	11.52	0.34				32.93	99.46	9.95	$(Zn_{0.81}Fe_{0.20})_{1.02}S_{1.00}$
S1-34	29001a	51.96	13.62					34.01	99.59	11.62	$(Zn_{0.75}Fe_{0.23})_{0.98}S_{1.00}$
S1-43	28131e	44.79	18.68	0.80	1.53			33.35	99.14	15.99	$(Zn_{0.66}Fe_{0.32}Cu_{0.02}Cd_{0.01})_{1.01}S_{1.00}$
	28131g	57.15	9.35	0.00	0.43			32.87	99.81	8.07	$(Zn_{0.85}Fe_{0.16}Cu_{0.01})_{1.02}S_{1.00}$
Reniform sphalerite											
4b	29001i	59.72	3.69			2.05	1.86	32.75	100.08	3.26	$(Zn_{0.89}Fe_{0.06}Ag_{0.02})_{0.98}S_{1.00}$
	29001j	59.78	2.38	0.28	0.13	1.40	3.69	32.03	99.70	2.14	$(Zn_{0.92}Fe_{0.04}Ag_{0.01})_{0.98}S_{1.00}$
	29001k	59.86	4.59	0.45			2.04	32.72	99.66	4.04	$(Zn_{0.90}Fe_{0.08}Ag_{0.02})_{0.98}S_{1.00}$
S1-8	29001l[c]	56.19	2.72	0.31		2.82	6.61	30.61	99.26	2.53	$(Zn_{0.90}Fe_{0.05}Ag_{0.03})_{0.98}S_{1.00}$
	29001m[r]	57.13	2.77	0.32		2.58	4.99	31.54	99.31	2.53	$(Zn_{0.89}Fe_{0.05}Ag_{0.02})_{0.97}S_{1.00}$
	29001n[r]	60.32	4.80	0.23		1.14	0.58	32.61	99.68	4.21	$(Zn_{0.91}Fe_{0.08}Ag_{0.01})_{1.00}S_{1.00}$
S1-10	29031r	38.35	8.77	22.59				29.61	99.33	8.41	$(Zn_{0.64}Cd_{0.22}Fe_{0.17})_{1.02}S_{1.00}$
	29031s	50.05	9.59	8.05				32.31	100.00	8.51	$(Zn_{0.76}Fe_{0.17}Cd_{0.07})_{1.00}S_{1.00}$
	29031u	53.20	11.19	0.45				34.24	99.08	9.60	$(Zn_{0.76}Fe_{0.19})_{0.95}S_{1.00}$
Framboidal sphalerite											
S1-9	29023h[c]	60.79	2.05				2.88	33.44	99.16	1.81	$(Zn_{0.89}Fe_{0.04})_{0.93}S_{1.00}$
	29023i[r]	63.49	2.52				0.00	33.14	99.15	2.20	$(Zn_{0.94}Fe_{0.04})_{0.98}S_{1.00}$
Microcrystalline sphalerite											
S1-20	29021l	52.03	13.16		0.83			33.90	99.91	11.21	$(Zn_{0.75}Fe_{0.22}Cu_{0.01})_{0.99}S_{1.00}$
S1-28	29036b	57.96	3.28			1.12	5.13	31.57	99.06	2.99	$(Zn_{0.90}Fe_{0.06}Ag_{0.01})_{0.97}S_{1.00}$
S1-32	29031b	49.50	15.87					33.82	99.18	13.56	$(Zn_{0.72}Fe_{0.27})_{0.99}S_{1.00}$
S1-33	29039a	51.02	14.74			0.83		32.94	99.53	12.69	$(Zn_{0.76}Fe_{0.26}Ag_{0.01})_{1.02}S_{1.00}$
S1-26	28131c	49.48	15.70		0.25			33.63	99.06	13.44	$(Zn_{0.72}Fe_{0.27})_{0.99}S_{1.00}$
Anhedral microcrystalline sphalerite											
4g	29006k[1]	33.23	0.95	38.32				26.50	99.21	1.00	$(Zn_{0.61}Cd_{0.41}Fe_{0.02})_{1.04}S_{1.00}$
4g	29006l	48.35	1.43	20.09				29.31	99.17	1.38	$(Zn_{0.81}Cd_{0.20}Fe_{0.03})_{1.04}S_{1.00}$
Anhedral microcrystalline sphalerite											

Figure no.	Analysis no.	Zn	Fe	Cd	Cu	Ag	Pb	S	Total	FeS, mol %	Formula
5c	29022j	35.68	9.36	25.88				29.08	100.00	9.06	$(Zn_{0.60}Cd_{0.25}Fe_{0.18})_{1.04}S_{1.00}$
	29022k	47.75	12.58	6.82				32.84	100.00	11.04	$(Zn_{0.71}Fe_{0.22}Cu_{0.06})_{0.99}S_{1.00}$
S1-2	29000b	53.51	0.47	12.55			3.19	29.41	99.14	0.45	$(Zn_{0.89}Cd_{0.12}Fe_{0.01})_{1.02}S_{1.00}$
	29000a	51.43	13.12	0.56			0.89	34.05	100.06	11.22	$(Zn_{0.74}Fe_{0.22})_{0.97}S_{1.00}$
S1-3	29031n	59.36	6.81					33.44	99.61	5.88	$(Zn_{0.87}Fe_{0.12})_{0.99}S_{1.00}$
S1-4	29001d	54.19	10.96	0.19	0.40			33.44	99.18	9.45	$(Zn_{0.79}Fe_{0.19}Cu_{0.01})_{0.99}S_{1.00}$
	29001e	53.72	11.48	0.45	0.18			33.64	99.48	9.87	$(Zn_{0.78}Fe_{0.20})_{0.99}S_{1.00}$
	29001g	55.62	9.41	0.35	0.81			33.19	99.39	8.14	$(Zn_{0.82}Fe_{0.16}Cu_{0.01})_{1.00}S_{1.00}$
	29001h	52.88	12.89	0.44	0.00			33.64	99.85	11.03	$(Zn_{0.77}Fe_{0.22})_{0.99}S_{1.00}$
S1-11	29019f	49.44	15.08	0.00	0.73			33.86	99.11	12.89	$(Zn_{0.72}Fe_{0.26}Cu_{0.01})_{0.98}S_{1.00}$
	29019g	49.97	13.33	1.56	0.87			33.94	99.68	11.42	$(Zn_{0.72}Fe_{0.23}Cd_{0.01}Cu_{0.01})_{0.97}S_{1.00}$
	29019h	38.75	5.63	22.75	1.34		2.00	29.61	100.08	5.45	$(Zn_{0.64}Cd_{0.22}Fe_{0.11}Cu_{0.02})_{0.99}S_{1.00}$
	29019i	36.01	3.49	26.27	1.86		3.49	28.27	99.39	3.52	$(Zn_{0.62}Cd_{0.27}Fe_{0.07}Cu_{0.03})_{0.99}S_{1.00}$
	29019j	32.43	0.83	38.19	1.12		0.00	26.92	99.49	0.87	$(Zn_{0.59}Cd_{0.40}Fe_{0.02}Cu_{0.02})_{1.03}S_{1.00}$
	29019k	32.53	1.40	36.31	1.74		0.00	27.26	99.24	1.45	$(Zn_{0.59}Cd_{0.38}Fe_{0.03}Cu_{0.03})_{1.03}S_{1.00}$
S1-12	29019a	43.76	1.96	23.29	0.86			29.42	99.29	1.90	$(Zn_{0.73}Cd_{0.23}Fe_{0.04}Cu_{0.01})_{1.01}S_{1.00}$
	29019b	44.22	2.55	23.24	0.00			29.37	99.38	2.47	$(Zn_{0.74}Cd_{0.23}Fe_{0.05})_{1.01}S_{1.00}$
	29019c	42.45	1.32	26.53	0.00			28.95	99.25	1.30	$(Zn_{0.72}Cd_{0.26}Fe_{0.03})_{1.01}S_{1.00}$
	29019d	40.04	2.69	27.25	0.00			29.06	99.04	2.66	$(Zn_{0.68}Cd_{0.27}Fe_{0.05})_{1.00}S_{1.00}$

Hereinafter, empty box, not determined; [c], center; [r], rim; [1], the analyses contain 0.21 wt % Sb. The formulas of Zn sulfides are based on one S atom.

Table S2. Correlation coefficients between chemical elements in various Zn and Cd sulfides of the Irinovskoe HSF.

	Zn–Fe	Zn–Cd	Fe–Cd	Fe–Ag	Fe–Pb	Ag–Pb	Zn–Pb	Cd–Pb
Zn sulfides								
Wurtzite	–0.96	0.36	–0.53	0.25	–	–	–	–
Reniform sphalerite	–0.58	–0.91	0.52	–0.85	–0.67	0.80	0.12	–0.36
Framboidal sphalerite	–0.96	–	–	–	–	–	–	–
Microcrystalline sphalerite	–0.99	–	–	–	–	–	–	–
Acicular sphalerite*	0.75	–0.93	–0.94	–	–0.30	–	–0.85	–0.60
Anhedral sphalerite	0.64	–0.93	–0.87	–	–	–	–	–
Cd sulfides								
	Zn–Fe	Zn–Cd	Fe–Cd	Cd–Ag	Cd–Cu	Zn–Cu		
Anhedral to subhedral grains	0.57	–0.46	–0.30	–0.84	0.08	–0.38		
Acicular crystals*	–0.17	–0.90	–0.29					
Spongy aggregates	0.75	–0.32	–0.82	–0.54	–	–		
All CdS phases	0.10	–0.85	–0.02	–0.06	0.54	–0.70		

The correlation coefficients are calculated in Statistica v. 10 program on the basis of chemical composition of Zn sulfides presented in Tables 2 and SM-1. Red values are significant correlation coefficients at a probability level of <0.05. *, all correlation coefficients are insignificant because of the low amount of analyses.

Table SM3. Chemical composition of Cd sulfides of the Irinovskoe HSF, wt%.

Figure no.	Analysis no.	Cd	Zn	Fe	Cu	Pb	Ag	S	Total	Formula
Anhedral grains and subhedral crystals										
SM1-3	29031m	47.50	25.15	0.39				26.31	99.35	$(Cd_{0.51}Zn_{0.47}Fe_{0.01})_{0.99}S_{1.00}$
SM1-10	29031o	51.10	22.66	0.00				25.61	99.37	$(Cd_{0.57}Zn_{0.43}Fe_{0.00})_{1.00}S_{1.00}$
	29031p	55.76	18.63	0.00				24.90	99.29	$(Cd_{0.64}Zn_{0.37}Fe_{0.00})_{1.01}S_{1.00}$
	29031q	48.46	24.87	0.00				26.35	99.68	$(Cd_{0.52}Zn_{0.46})_{0.99}S_{1.00}$
	29031v	50.70	22.33	0.53				26.33	99.89	$(Cd_{0.55}Zn_{0.42}Fe_{0.01})_{0.98}S_{1.00}$
	29031t	48.27	24.86	0.50				26.37	100.00	$(Cd_{0.52}Zn_{0.46}Fe_{0.01})_{1.00}S_{1.00}$
SM1-13	29030d	55.36	18.50	0.62				24.78	99.26	$(Cd_{0.64}Zn_{0.37}Fe_{0.01})_{1.02}S_{1.00}$
	29030c	54.30	19.20	0.56				25.39	99.45	$(Cd_{0.61}Zn_{0.37}Fe_{0.01})_{0.99}S_{1.00}$
SM1-14	29020d	43.75	26.40	1.87	0.66			27.32	100.00	$(Cd_{0.46}Zn_{0.47}Fe_{0.04})_{0.98}S_{1.00}$
	29020e	51.51	17.49	4.40	0.45			26.15	100.00	$(Cd_{0.56}Zn_{0.33}Fe_{0.10}\ Cu_{0.01})_{1.00}S_{1.00}$
SM1-15	29011h	63.60	5.52	3.15	0.69		4.89	22.15	100.00	$(Cd_{0.82}Zn_{0.12}Fe_{0.08}Ag_{0.07}Cu_{0.02})_{1.10}S_{1.00}$
	29011i	62.16	7.54	4.19	0.47		3.91	21.73	100.00	$(Cd_{0.82}Zn_{0.17}Fe_{0.11}Ag_{0.05}Cu_{0.01})_{1.16}S_{1.00}$
	29011j	62.74	7.91	2.92	0.66		3.23	22.53	100.00	$(Cd_{0.79}Zn_{0.17}Fe_{0.07}Ag_{0.04}Cu_{0.01})_{1.10}S_{1.00}$
Acicular crystals										
SM1-16	29022a	51.62	17.74	4.56				25.15	99.07	$(Cd_{0.59}Zn_{0.35}Fe_{0.10})_{1.04}S_{1.00}$
	29022b	48.82	18.04	6.38				25.93	99.17	$(Cd_{0.54}Zn_{0.34}Fe_{0.14})_{1.02}S_{1.00}$
	29022c	43.35	17.10	10.81				27.97	99.23	$(Cd_{0.44}Zn_{0.30}Fe_{0.22})_{0.96}S_{1.00}$
	29022d	38.52	22.10	6.71		5.87		25.82	99.03	$(Cd_{0.43}Zn_{0.42}Fe_{0.15}\ Pb_{0.04})_{1.03}S_{1.00}$

The formulas of Cd sulfides are based on one S atom.

Table S4. Chemical composition of chalcopyrite, isocubanite, covellite and galena of the Irinovskoe HSF. wt%.

Figure no.	Analysis no.	Cu	Fe	Zn	Ag	Sb	Pb	S	Total	Formula
Chalcopyrite										
SM1-4	29001f	30.25	28.04	5.97				34.97	99.23	$Cu_{0.87}(Fe_{0.92}Zn_{0.17})_{1.09}S_{2.00}$
Isocubanite										
SM1-43	28131d	20.78	41.09	2.20				35.18	99.26	$Cu_{0.89}(Fe_{2.01}Zn_{0.09})_{2.10}S_{3.00}$
	28131f	20.17	41.85	2.38				34.84	99.24	$Cu_{0.88}(Fe_{2.07}Zn_{0.10})_{2.10}S_{3.00}$
Acicular covellite										
SM1-20	29021i[1]	63.55	0.70	0.26				34.07	99.19	$(Cu_{0.94}Fe_{0.01})_{0.95}S_{1.00}$
	29021j	53.12	3.43	8.52				34.93	100.00	$(Cu_{0.77}Zn_{0.12}Fe_{0.06})_{0.95}S_{1.00}$
	29021k	53.95	3.36	7.35				35.34	100.00	$(Cu_{0.77}Zn_{0.10}Fe_{0.05})_{0.93}S_{1.00}$
Ag-rich Cu sulfides										
7e	29030b	22.84		1.61	35.72	17.45		21.53	99.15	$(Cu_{0.54}Ag_{0.44}Sb_{0.21}Zn_{0.04})_{1.28}S_{1.00}$
SM1-38	29029f	33.93			38.38			26.97	99.29	$(Cu_{0.63}Ag_{0.42})_{1.06}S_{1.00}$
SM1-24	29033c	30.26		0.62	40.67	3.19		24.75	99.49	$(Cu_{0.62}Ag_{0.49}Sb_{0.03}Zn_{0.01})_{1.15}S_{1.00}$
SM1-38	29029g	32.91			33.00	9.50		24.45	99.86	$(Cu_{0.68}Ag_{0.40}Sb_{0.10})_{1.18}S_{1.00}$
SM1-42	29006o	43.80		1.53	29.85			24.81	100.00	$(Cu_{0.89}Ag_{0.36}Zn_{0.03})_{1.28}S_{1.00}$
Galena										
SM1-26	28131a						86.35	13.42	99.77	$Pb_{1.00}S_{1.00}$
	28131b						86.47	13.41	99.89	$Pb_{1.00}S_{1.00}$
SM1-27	29037a						85.88	13.52	99.39	$Pb_{1.00}S_{1.00}$
SM1-31	29032a						85.58	13.61	99.20	$Pb_{0.97}S_{1.00}$

[1], analysis contains 0.61 wt % Co. The formulas of minerals are based on two (chalcopyrite), three (isocubanite), and one (covellite and galena) S atoms.

Table S5. Chemical composition of non-stoichiometric Ag–Sb–Cu minerals of the Irinovskoe HSF, wt%.

Figure no.	Analysis no.	Ag	Cu	Sb	Zn	S	Total
9d	29033d	55.47	11.68	12.17	1.13	18.58	99.03
SM1-22	29034b[1]	60.29	9.63	12.69	1.20	14.61	99.10
SM1-23	29033j	54.09	12.70	12.95	0.84	19.15	99.73
SM1-24	29033a	56.63	12.06	10.34	0.75	19.43	99.20
SM1-24	29033b	55.91	12.58	10.41	0.74	19.63	99.28
SM1-34	29001b	59.70	5.26	12.21	1.39	20.67	99.23
SM1-34	29001c	62.30	6.63	11.27	1.13	18.55	99.89
SM1-36	29034e[2]	62.59	6.08	11.19	1.31	17.90	99.42
SM1-39	29022e[3]	41.79	20.12	14.44		22.80	100.00

The analyses contain 0.69 wt % Cd ([1]), 0.35 wt % As ([2]) and 0.84 wt % Fe ([3]).

Table S6. Chemical composition of Fe- and Mn-oxyhydroxides of the Irinovskoe HSF, wt%.

Figure no.	Analysis no.	MnO	FeO	ZnO	SiO_2	Al_2O_3	CaO	MgO	P_2O_5	SO_3	Cl	K_2O	V_2O_5	CoO	NiO	PbO	TiO_2	Total
Fe-oxyhydroxides after opal																		
SM1-44	29009c		54.60	3.16	18.26	3.55				2.00	0.22							81.79
	29008c		51.65	1.47	18.56	3.05				2.02								76.75
	29040b		53.91	1.03	15.58	3.03				1.65								75.21
Fe-oxyhydroxides after ZnS																		
SM1-33	29039b[1]		39.08	5.28	5.45	2.11				14.37	0.15							82.82
	29039d		55.48	4.00	6.44	2.62				2.55	0.26							71.35
	29038e		52.17	6.44	7.51	3.41	0.19			3.59	0.24							73.54
Mn-free Fe-oxyhydroxides from the outer crust																		
10c	28130h		57.72	3.92	7.28	2.71	0.39	0.77	1.65	2.36	0.27							77.06
SM1-47	29046b		58.95	3.69	5.30	0.93	0.13	0.00	0.70	1.72	0.45					0.48		72.35
	29046a		58.65	4.14	7.06	1.41	0.27	0.41	0.58	0.71	0.55					0.78		74.55
	29046d		51.15	2.93	7.83	3.25	0.52	1.10	0.40	2.34	0.42					0.38		70.44
SM1-48	29046e[2]		57.24	2.75	5.71	0.75	0.41	0.57	1.11	0.84	0.47					0.43		70.52
	29046f[3]		55.97	3.11	5.64	1.60	0.33	0.31	1.19	1.01	0.35					0.62		70.51
	29046g[4]		55.07	2.64	7.25	0.75	0.33	0.97	0.49	0.87	0.31					0.60		69.53
	29046h		50.30	2.50	7.73	3.27	0.64	0.75	1.26	2.12	0.37					0.79		69.73
Mixed aggregates of Fe- and Mn-oxyhydroxides from the outermost crust																		
SM1-45	29045e	27.22	14.06	11.52	4.49	1.42	1.61	0.92	0.63	6.87	0.25	0.66	0.33	0.78	0.32	0.72	0.32	72.14
	29045f	24.94	12.20	9.08	4.42	1.23	1.18	0.58	0.57	6.11	0.19	0.55		0.79	0.26			62.09
	29045g	38.54	6.59	15.82	2.36	1.15	1.95	2.09	0.28	2.56	0.19	0.20	0.36		0.26			72.34
	29045h	23.42	17.51	7.66	7.19	1.74	2.39	2.30	1.03	0.99	0.55							64.79
	29045i	1.12	57.74	6.65	5.70	0.88	0.68	0.46	1.54	1.86	0.16		0.73					77.53
	29045j	8.20	42.62	6.74	5.52	1.17	1.54	0.86	1.02	5.39	0.20	0.31	0.65	0.42				74.64
	29045k	7.20	46.95	6.74	6.30	0.96	0.62	0.69	1.36	4.48	0.15	0.27	0.66	0.00			0.38	76.77
SM1-46	29045l	17.65	19.33	10.26	7.50	3.60	1.25	0.94	2.08	5.27	0.30	0.41	0.25	1.85		1.24	0.37	72.28
	29045m	18.99	19.36	10.14	7.24	3.26	1.11	1.05	0.95	5.27	0.33	0.37	0.37	2.26		1.87	0.36	72.93
	29045n	25.23	8.51	10.90	7.24	2.88	1.21	1.58	0.34	3.44	0.46	0.21	0.29	2.95		1.33	0.30	66.87
	29045o	4.85	46.73	7.04	6.99	1.58	0.80	0.83	1.62	5.55	0.21	0.34	0.55	0.20		0.81	0.39	78.48
	29045p	4.08	46.72	4.38	5.24	1.12	1.65	0.36	2.02	2.86	0.33	0.17	0.55	0.13		1.23	0.42	71.24

*, The analyses contain: [1], 13.37 wt % Ag_2O and 3.01 Cu_2O; [2, 3, 4], 0.20, 0.36 and 0.26 wt % Cu_2O, respectively.

Table S7. Chemical composition of baryte and anglesite of the Irinovskoe HSF, wt%.

Figure no.	Analysis no.	BaO	SrO	PbO	FeO	CaO	SO_3	Total
Baryte								
10c	28130g	57.02	6.04		0.59	0.36	35.61	99.62
SM1-47	29046c	56.46	5.32		1.06	0.35	36.10	99.29
SM1-49	29021a	56.90	5.32		0.69	0.78	35.54	99.22
Anglesite								
10d	29021b			75.10			24.90	100.00
	29021c			74.96			25.04	100.00
	29021d			73.73			26.27	100.00

Table S8. Analytical uncertainties for AAA-based contents of chemical elements of chimney samples from the Irinovskoe HSF, ppm.

Sample	Fe*	Cu	Zn	Cd	Pb	Co	Ni	Au	Ag
IMin data									
241-1/1	±0.59	±11490	±911	±9.44	±6.56	±57.51	±17.64	±1.68	±9.02
241-2/2	±0.52	±2048	±4140	±77.35	±44.28	±126	±10.63	±2.27	±27.18
241-2/3	±0.47	±1077	±6213	±220	±286	±47.97	±11.03	±1.80	±48.07
PMGE data (unpublished report 2011)									
241	±0.38	±0.20*	±0.59*	–	±143	±68.31	±31.52	±2.27	±24.21
241-m-2	±0.62	±0.15*	±0.53*	±181	±295	±65.52	±15.48	±0.84	±37.94

*, wt %

Table S9. Analytical uncertainties for ICP-MS-based contents of chemical elements of chimney samples from the Irinovskoe HSF, ppm.

Sample	Ti	V	Cr	Mn	As	Se	Sr	Mo	Sn	Sb	Te	Ba	Tl	Bi	U
241-1/1	10.1	3.0	4.5	7.1	74	47	11.7	13.2	30.9	1.7	1.7	80	0.2	2.0	0.2
241-2/2	28.0	3.1	4.9	51.7	137	10.5	7.6	15	76	42.8	0.3	97	1.7	0.8	1.0
241-2/3	5.43	12.9	4.4	172	151	5.1	41.2	22.3	67	68	0.1	536	2.7	0.1	0.8

Table S10. Composition of primary reactants in calculations (atomic amounts).

	Basaltic glass (1 kg)* [39]	Peridotite (1 kg)** [40]	Seawater (per 1 kg H_2O) [41]	Volcanic gas (10 g) [42]
Ag	2.1×10^{-7}	1.98×10^{-7}	1.9×10^{-11}	9.5×10^{-10}
Al	2.97	0.563	1.1×10^{-9}	
As	2.27×10^{-6}	8.51×10^{-6}	1.6×10^{-8}	
Au	6.1×10^{-9}	1.4×10^{-8}	1×10^{-13}	7.6×10^{-11}
B	6.289×10^{-4}		4.162×10^{-4}	
Ba	3.578×10^{-4}	8.411×10^{-5}	1.09×10^{-7}	1×10^{-9}
Bi	3.5×10^{-8}			
Br	4.74×10^{-6}		8.385×10^{-4}	
C	5.838×10^{-3}	0.016	2.248×10^{-3}	0.073
Ca	2.0718	0.0315	1.028×10^{-2}	
Cd	1.266×10^{-6}	3.98×10^{-7}	6×10^{-10}	2.67×10^{-7}
Cl	3.621×10^{-3}		0.546	1.628×10^{-3}
Co	7.535×10^{-4}	1.738×10^{-3}	2×10^{-11}	
Cr	6.493×10^{-3}	0.058	4×10^{-9}	

Cu	1.3×10^{-3}	3.477×10^{-4}	2.4×10^{-9}	3.15×10^{-7}
F	1.494×10^{-2}		6.843×10^{-5}	1.178×10^{-3}
Fe	1.376	1.137	5.4×10^{-10}	7.341×10^{-6}
H	0.318	0.803	1.14×10^{-3}	0.445
I	4.544×10^{-7}		4.57×10^{-7}	
K	0.041	0.011	1.02×10^{-2}	8.184×10^{-6}
Mg	1.885	10.088	0.053	
Mn	0.025	0.024	3.6×10^{-10}	
N	5.501×10^{-6}			2.318×10^{-2}
Na	0.807	0.049	0.469	2.653×10^{-5}
Ni	4.01×10^{-3}	0.038	8.2×10^{-9}	
O	28.109	27.853	0.1196	0.437
P	0.023		2.002×10^{-6}	
Pb	3.297×10^{-6}	6.033×10^{-6}	1.3×10^{-11}	2.4×10^{-8}
S	0.031	0.0402	0.028	0.04
Sb	1.46×10^{-7}	1.782×10^{-6}	1.64×10^{-9}	3.3×10^{-10}
Se	4.132×10^{-6}	1.208×10^{-6}	2×10^{-9}	2.91×10^{-7}
Si	8.425	7.37	9.97×10^{-5}	
Sr	1.6×10^{-3}	3.554×10^{-4}	8.902×10^{-5}	
Te	2.4×10^{-8}			
Ti	0.178	0.01		
Tl	1.16×10^{-7}		6.4×10^{-11}	
Zn	1.1398×10^{-3}	7.834×10^{-4}	5.4×10^{-9}	3.06×10^{-7}

* and **, average for 3480 and four analyses, respectively. Data from PetDB database [39] were downloaded on May 22, 2018. The primary data were recalculated for atomic amounts of elements. The composition of seawater was corrected for pH value of 8.06 (T 25 °C, P 1 bar) by adding 0.00015 m HCl.