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Small-scale heterogeneity of trace metals including rare earth elements and yttrium in deep-sea sediments and porewaters of the Peru Basin, southeastern equatorial Pacific

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Supplementary Material 1

Averages, standard deviation, accuracy, and method precision calculated from averages of each digested sample.

Table S1: Replicate analyses of MESS-3 reference material during ICP-OES measurements (n=13 digested samples, 10 ICP-OES runs).

LOQ[#] [mg/kg]	Element	MESS-3 reference [mg/kg]	MESS-3 measured [mg/kg]	Accuracy (%)	Method precision (%RSD)
19-231	**Al**	85900±2300	68879±13622	-20	20
13-158	**Ca**	14700±600	13291±1094	-10	8
5-24	**Cu**	33.9±1.6	33±1	-3	4
98-379	**Fe**	43400±1100	39219±2264	-10	6
9-101	**Mn**	324±12	302±22	-7	7
86-741	**P**	1200a	1257±128	+5	10
2-16	**Sr**	129±11	114±17	-11	15
8-28	**V**	243±10	233±17	-4	7
4-15	**Zn**	159±8	147±6	-7	4

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run
[a] information value

Table S2: Replicate analyses of BHVO-2 reference material during ICP-OES measurements (n=13 digested samples, 10 ICP-OES runs).

LOQ[#] [mg/kg]	Element	BHVO-2 reference [mg/kg]	BHVO-2 measured [mg/kg]	Accuracy (%)	Method precision (%RSD)
19-231	**Al**	71600±800	74535±1889	+4	3
13-158	**Ca**	81700±1200	83017±2188	+2	3
5-24	**Cu**	127±7	135±5	+7	3
98-379	**Fe**	86300±1400	87880±2323	+2	3
9-101	**Mn**	1290±40	1347±35	+4	3
86-741	**P**	1200±100	1307±143	+9	11
2-16	**Sr**	389±23	392±10	+1	3
8-28	**V**	317±11	315±16	+22	19
4-15	**Zn**	103±6	117±5	+14	5

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run

Table S3: Replicate analyses of MESS-3 reference material during ICP-MS measurements (n=13 digested samples, 8 ICP-MS runs; one less for Mo).

Average LOQ[#] [mg/kg]	Element	MESS-3 reference [mg/kg]	MESS-3 measured [mg/kg]	Accuracy (%)	Method precision (%RSD)
0.25	**Co**	14.4±2	14.5±0.5	+1	4
0.25	**Ni**	46.9±2.2	49.1±2	+5	4
0.67	**Mo**	2.78±0.07	2.78±0.16	0	6
0.07	**U**	4b	3.3±0.7	-17	21

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run
[b] information value

Table S4: Replicate analyses of BHVO-2 CRM during ICP-MS measurements (n=13 digested samples; 9 ICP-MS runs; one less for Co, Ni, Ba, Eu, and Tb).

Average LOQ[#] [mg/kg]	Element	BHVO-2 recommended [mg/kg]	BHVO-2 measured [mg/kg]	Accuracy (%)	Precision (%)
0.25	**Co**	45±3	46±1	+2	3
0.25	**Ni**	119±7	125±4	+5	3
0.58	**Ba**	130±13	129±6	-1	5
0.10	**Y**	26±2	25±1	-5	3
0.05	**La**	15±1	16±1	+4	5
0.05	**Ce**	38±2	39±2	+3	5
0.04	**Pr**	---	5.5±0.3	---	5
0.28	**Nd**	25.0±1.8	25±1	0	5
0.24	**Sm**	6.2±0.4b	6.3±0.3	+1	5
0.09	**Eu**	---	2.1±0.1	---	5
0.15	**Gd**	6.3±0.2b	6.7±0.4	+7	6
0.05	**Tb**	0.9b	0.96±0.04	+7	5
0.15	**Dy**	---	5.5±0.3	---	5
0.05	**Ho**	1.04±0.04b	1.00±0.04	-4	4
0.13	**Er**	---	2.6±0.1	---	5
0.05	**Tm**	---	0.34±0.02	---	5
0.15	**Yb**	2.0±0.2b	2.0±0.1	+2	4
0.04	**Lu**	0.28±0.01b	0.28±0.02	-2	6

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run
[b] information value

Table S5: Replicate analyses of NASS-6 seawater certified reference material during ICP-MS measurements.

LOQ[#] [µg/kg]	Element	n (number of ICP-MS runs)	NASS-6 reference [µg/kg]	NASS-6 measured [µg/kg]	Accuracy (%)	Method precision (%RSD)
0.029-0.80	**Cd**	3	0.0303±0.0019	0.037±0.0012	+22	3.1
0.02-0.17	**U**	5	3[a]	2.73±0.1	-9	3.7
0.44-2.90	**V (KED)**	4	1.42±0.16	1.45±0.08	+2	5.5
0.56-2.20	**Mn (KED)**	---	0.516±0.047	---		
0.07-0.26	**Co (KED)**	---	0.015[a]	---		
0.12-3	**Cu (KED)**	---	0.242±0.025	---		
0.88-4.8	**As (KED)**	2	1.40±0.12	1.22±0.02	-13	1.5
0.3-5.7	**Mo (KED)**	5	9.66±0.70	9.87±0.27	+2	2.7

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run
[a] information value

Table S6: Replicate analyses of NASS-7 seawater certified reference material during ICP-MS measurements.

LOQ[#] [µg/kg]	Element	n (number of ICP-MS runs)	NASS-7 reference [µg/kg]	NASS-7 measured [µg/kg]	Accuracy (%)	Method precision (%RSD)
0.029-0.80	**Cd**	2	0.0157±0.0016	0.021±0.003	+34	14
0.02-0.17	**U**	7	2.81±0.16	2.65±0.23	-6	8.6
0.44-2.90	**V (KED)**	5	1.27±0.08[a]	1.38±0.15	+9	11
0.56-2.20	**Mn (KED)**	1	0.74±0.06	0.73	-1	---
0.07-0.26	**Co (KED)**	---	0.0143±0.0014	---		
0.12-3	**Cu (KED)**	---	0.195±0.014	---		
0.88-4.8	**As (KED)**	4	1.23±0.06[a]	1.14±0.12	-7	11
0.3-5.7	**Mo (KED)**	7	9.10±0.40	8.99±0.43	-1	4.8

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run
[a] reference value

Table 7: Replicate analyses of SLEW-3 estuarine water reference material during ICP-MS measurements (n= 7 ICP-MS runs). Runs for which the values were far below the LOQ were excluded.

LOQ[#] [µg/kg]	Element	n (number of ICP-MS runs)	SLEW-3 reference [µg/kg]	SLEW-3 measured [µg/kg]	Accuracy (%)	Method precision (%RSD)
0.029-0.80	**Cd**	5	0.047±0.004	0.052±0.003	+10	6.4
0.02-0.17	**U**	7	1.8[b]	1.51±0.12	-16	8.2
0.44-2.90	**V (KED)**	7	2.54±0.31	2.75±0.29	+8	10.7
0.56-2.20	**Mn (KED)**	6	1.59±0.22	1.29±0.22	-19	17.4
0.07-0.26	**Co (KED)**	---	0.040±0.010	---		
0.12-3	**Cu (KED)**	6	1.53±0.12	1.51±0.45	-1	30
0.88-4.8	**As (KED)**	2	1.34±0.09	1.27±0.03	-5	2.2
0.3-5.7	**Mo (KED)**	7	5.1[b]	4.7±0.3	-8	6.7

[#] LOQ: limit of quantification; 10*standard deviation of acid blanks for each run

[b] information value