

Electronic Supplementary Information (ESI)

SP-IM and SP-SP: two potential natural sphalerite reference materials for in situ Zn and S isotope analysis by LA-MC-ICP-MS

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Supplementary Information

Table S1. Trace element compositions of SP-IM and SP-SP determined by LA-ICP-MS

	Cr	Mn	Fe	Co	Ni	Cu	Cd	Sn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SP-IM-1	0.00	153.52	1413.79	0.03	0.01	3.71	1337.57	1.15
SP-IM-2	0.00	153.07	1472.10	0.01	0.02	6.33	1340.98	1.32
SP-IM-3	0.07	154.21	1510.11	0.05	0.02	5.57	1249.85	1.55
SP-IM-4	0.01	150.94	1390.85	0.02	0.00	4.53	1281.46	1.43
SP-IM-5	0.21	131.89	1256.69	0.00	0.02	3.69	1317.81	1.44
SP-IM-6	0.00	126.45	1188.09	0.01	0.00	3.08	1261.04	1.62
SP-IM-7	0.00	123.40	1146.37	0.03	0.01	5.15	999.36	2.76
SP-IM-8	0.00	117.11	1266.06	0.03	0.01	3.52	1005.66	1.67
SP-IM-9	0.06	120.75	1258.42	0.02	0.05	3.13	1037.17	1.73
SP-IM-10	0.00	120.58	1274.01	0.09	0.00	3.29	1018.39	1.08
SP-IM-11	0.07	127.61	1254.66	0.04	0.02	4.82	1135.82	1.23
SP-IM-12	0.04	119.36	1234.29	0.03	0.05	3.94	1041.79	1.35
SP-IM-12	0.07	115.74	1252.15	0.04	0.04	4.25	1010.80	1.32
SP-IM-14	0.00	94.43	1064.57	0.02	0.06	3.94	1042.94	1.57
SP-IM-15	0.00	102.30	1128.36	0.02	0.00	3.77	928.87	1.26
SP-IM-16	0.05	105.89	1173.75	0.00	0.04	4.34	879.94	1.33
SP-IM-17	0.04	107.29	1144.34	0.00	0.10	3.85	822.37	1.46
SP-IM-18	0.00	73.12	819.47	0.01	0.02	2.82	791.49	1.19
SP-IM-19	0.00	58.44	652.39	0.06	0.00	4.16	757.25	1.00
SP-IM-20	0.00	52.94	635.74	0.01	0.00	3.03	714.13	1.31
Mean	0.03	115.45	1176.81	0.03	0.02	4.05	1048.73	1.44
RSD (%)	158.97	24.52	19.55	76.23	108.45	21.56	18.50	24.81
SP-SP-1	0.20	1.03	752.91	24.03	0.25	81.51	4752.45	6.49
SP-SP-2	0.00	1.07	738.41	25.97	0.22	4.68	5056.94	1.44
SP-SP-3	0.07	1.07	717.19	25.61	0.24	4.84	4977.32	1.35
SP-SP-4	0.00	0.95	693.56	25.91	0.27	4.22	4727.92	1.53
SP-SP-5	0.00	1.24	733.23	26.02	0.35	4.65	4717.10	1.26
SP-SP-6	0.00	1.03	734.16	25.08	0.27	69.75	4091.90	16.54
SP-SP-7	0.15	1.18	772.13	27.37	0.21	3.89	4716.49	1.37
SP-SP-8	0.10	1.16	707.70	24.60	0.26	2.95	4893.40	1.18
SP-SP-9	0.12	0.91	706.66	22.34	0.39	2.88	5047.85	1.37
SP-SP-10	0.14	1.05	732.48	19.39	0.20	3.05	5218.78	1.12
SP-SP-11	0.00	1.06	803.66	27.44	0.28	25.85	4707.92	3.61
SP-SP-12	0.05	1.05	773.96	25.56	0.29	3.59	5238.75	1.90
SP-SP-13	0.10	1.12	793.73	20.73	0.25	2.98	5319.19	1.66
SP-SP-14	0.06	1.05	709.65	17.12	0.16	77.63	4162.23	3.21
SP-SP-15	0.00	1.10	742.23	16.86	0.16	4.86	4668.96	1.49
SP-SP-16	0.08	1.18	658.26	15.56	0.14	13.88	4360.24	1.97
SP-SP-17	0.08	0.96	679.27	14.10	0.18	17.33	4391.85	1.61
SP-SP-18	0.16	0.93	589.39	13.59	0.11	44.54	4219.53	2.83
SP-SP-19	0.15	0.75	612.23	13.46	0.25	19.80	4139.71	1.99
SP-SP-20	0.05	0.83	554.78	11.23	0.20	93.77	3564.94	3.35
Mean	0.08	1.04	710.28	21.10	0.23	24.33	4648.67	2.86
RSD (%)	82.20	11.33	8.97	25.02	28.12	123.96	9.57	117.77

Table S2. Results of $\delta^{34}\text{S}_{\text{V-CDT}}$ (‰) in SP-IM and SP-SP using EA-IRMS.

Sample	Raw data	Average	2SD	Number
SP-IM	-1.82			
SP-IM	-1.84	-1.94	0.22	4
SP-IM	-2.04			
SP-IM	-2.06			
SP-SP	3.78			
SP-SP	3.72	3.78	0.08	4
SP-SP	3.83			
SP-SP	3.79			