

Table S1. EMPA analyses of pyrite grains from the different stages in the Sanhetun Te-Au deposit (all values in wt. %).

Stage	Sample no.	S	Fe	Au	Ag	Te	Se	As	Cu	Pb	Zn	Co	Ni	Total
Py1	zk2904g7-1-1	52.64	46.03	bdl	0.01	0.04	bdl	0.01	bdl	0.20	0.13	0.09	0.01	99.16
Py1	zk2904g7-1-2	52.87	46.35	bdl	0.01	bdl	bdl	bdl	bdl	0.07	0.04	0.04	bdl	99.38
Py1	zk2904g7-1-3	52.97	47.00	bdl	0.01	bdl	0.02	bdl	0.02	bdl	0.01	0.05	bdl	100.08
Py1	zk2904g7-1-4	53.01	46.58	bdl	0.03	bdl	0.01	0.03	0.01	0.13	bdl	0.04	bdl	99.84
Py1	zk2904g7-1-5	53.03	46.62	bdl	0.01	bdl	0.02	0.03	bdl	0.02	0.12	0.02	bdl	99.88
Py1	zk2904g7-1-6	53.06	46.79	bdl	0.06	bdl	bdl	0.02	0.01	0.01	bdl	0.04	bdl	99.99
Py1	zk2904g7-1-7	53.15	47.02	bdl	bdl	0.01	bdl	bdl	bdl	0.07	bdl	0.06	bdl	100.31
Py1	zk2904g7-1-8	53.17	46.57	bdl	bdl	bdl	bdl	bdl	0.02	0.01	0.08	0.04	bdl	99.88
Py1	zk2904g7-1-9	53.22	46.81	bdl	bdl	bdl	bdl	bdl	0.02	0.04	bdl	0.01	bdl	100.10
Py1	zk1001g2-1-1	53.25	46.71	bdl	bdl	bdl	bdl	bdl	bdl	0.01	0.04	bdl	bdl	100.01
Py1	zk1001g2-1-2	53.33	46.60	bdl	0.02	bdl	bdl	0.01	0.04	bdl	bdl	0.05	bdl	100.05
Py1	zk1001g2-1-3	53.35	46.58	0.01	0.02	0.03	0.01	bdl	bdl	bdl	bdl	0.07	bdl	100.07
Py1	zk1001g2-1-4	53.35	46.89	bdl	0.04	bdl	bdl	bdl	0.03	0.03	bdl	0.06	bdl	100.41
Py1	zk1001g2-1-5	53.36	46.86	0.02	0.02	0.07	bdl	bdl	0.02	bdl	bdl	0.06	bdl	100.41
Py1	zk1001g2-1-6	53.39	46.48	bdl	0.02	bdl	0.02	bdl	bdl	0.07	0.02	0.01	bdl	100.00
Py1	zk1001g2-1-7	53.41	46.19	bdl	bdl	0.10	bdl	bdl	bdl	bdl	0.05	0.05	bdl	99.80
Py1	zk1001g2-1-8	53.42	47.14	bdl	bdl	0.01	0.06	bdl	0.02	0.07	0.04	0.02	bdl	100.78
Py1	zk1001g2-1-9	53.43	46.82	bdl	0.04	bdl	0.02	0.03	bdl	0.01	0.01	0.03	bdl	100.40
Py1	zk1001g2-1-10	53.45	46.35	bdl	bdl	0.06	0.08	0.02	bdl	0.03	bdl	0.03	0.01	100.02
Py2	zk2905g5-1-1	53.46	46.33	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.08	0.02	bdl	99.89
Py2	zk2905g5-1-2	53.47	46.58	bdl	bdl	bdl	bdl	bdl	0.06	bdl	0.03	0.02	0.08	100.25
Py2	zk2905g5-1-3	53.48	47.00	0.01	bdl	bdl	bdl	bdl	0.04	0.08	bdl	0.05	0.03	100.68
Py2	zk2905g5-1-4	53.48	46.68	bdl	0.02	0.02	bdl	bdl	bdl	0.01	0.02	0.05	bdl	100.28
Py2	zk2905g5-1-5	53.48	47.06	bdl	0.07	bdl	bdl	bdl	0.02	0.02	bdl	0.04	bdl	100.70
Py2	zk2905g5-1-6	53.49	46.63	bdl	bdl	bdl	bdl	bdl	bdl	0.06	bdl	0.01	bdl	100.20
Py2	zk2905g5-1-7	53.51	46.53	bdl	bdl	0.05	bdl	bdl	bdl	bdl	0.03	bdl	bdl	100.12
Py2	zk2905g5-1-8	53.56	46.85	bdl	bdl	bdl	0.05	bdl	bdl	0.14	0.06	0.05	bdl	100.71
Py2	zk2905g5-1-9	53.59	46.81	bdl	bdl	bdl	bdl	bdl	0.03	0.04	bdl	0.01	bdl	100.49
Py2	zk2905g5-1-10	53.60	46.73	bdl	bdl	0.04	bdl	bdl	bdl	bdl	0.04	0.01	bdl	100.41
Py2	zk2905g5-1-11	53.65	46.74	bdl	bdl	bdl	bdl	0.02	0.03	0.04	bdl	0.04	bdl	100.51
Py2	zk2905g5-1-12	53.65	46.76	0.02	bdl	bdl	bdl	bdl	bdl	0.02	bdl	bdl	0.04	100.48
Py2	zk2905g5-1-13	53.67	46.92	0.02	bdl	0.02	bdl	bdl	0.04	0.01	0.03	0.03	bdl	100.73
Py2	zk2905g5-1-14	53.69	47.03	bdl	0.01	bdl	bdl	0.04	bdl	0.03	bdl	0.08	bdl	100.87
Py2	zk2905g5-1-15	53.70	47.14	bdl	bdl	bdl	bdl	bdl	0.04	bdl	bdl	0.02	bdl	100.90
Py2	zk2905g5-1-16	53.71	46.68	bdl	bdl	0.08	0.03	bdl	bdl	0.06	bdl	0.03	bdl	100.60
Py2	zk2905g5-1-17	53.71	46.41	bdl	bdl	bdl	0.05	bdl	bdl	0.02	0.06	0.05	0.01	100.31
Py2	zk2905g5-1-18	53.72	46.99	bdl	0.03	0.02	bdl	bdl	0.01	0.07	bdl	bdl	0.01	100.86
Py2	zk2905g5-1-19	53.74	46.91	bdl	0.02	bdl	bdl	bdl	bdl	0.03	0.04	bdl	bdl	100.75
Py2	zk2905g5-1-20	53.76	46.95	bdl	bdl	0.03	bdl	bdl	bdl	0.09	0.01	bdl	bdl	100.84
Py2	zk2905g5-1-21	53.81	47.01	bdl	bdl	bdl	bdl	0.01	0.02	0.07	bdl	0.06	0.01	100.99
Py2	zk2905g5-1-22	53.82	46.29	bdl	bdl	bdl	bdl	0.03	0.04	0.01	0.03	bdl	bdl	100.23
Py2	zk2905g5-1-23	53.91	46.54	bdl	0.02	0.01	bdl	0.01	0.08	bdl	0.02	0.06	bdl	100.66
Py2	zk2905g5-1-24	53.93	46.58	bdl	bdl	bdl	bdl	bdl	bdl	0.04	bdl	bdl	bdl	100.55
Py3	zk2905g3-1	53.95	46.52	bdl	0.04	bdl	bdl	bdl	bdl	bdl	0.08	0.11	bdl	100.68
Py3	zk2905g3-2	53.98	46.64	0.02	0.02	0.03	bdl	bdl	bdl	0.06	0.01	0.03	bdl	100.79
Py3	zk2905g3-3	52.54	46.37	0.02	0.07	bdl	bdl	bdl	bdl	bdl	0.04	0.08	0.01	99.14
Py3	zk2905g3-4	52.55	46.55	0.08	bdl	bdl	bdl	bdl	bdl	0.04	0.03	0.04	0.01	99.29
Py3	zk2905g3-5	53.87	46.65	0.02	bdl	0.01	bdl	0.02	0.01	0.07	0.03	0.15	0.01	100.83
Py3	zk2905g3-6	53.88	46.84	0.02	0.01	bdl	0.05	bdl	bdl	0.05	0.04	0.06	0.01	100.96
Py3	zk2905g3-7	53.24	47.31	0.04	bdl	bdl	0.00	bdl	bdl	bdl	0.02	0.05	bdl	100.65
Py3	zk2905g3-8	53.25	46.57	0.04	0.03	0.03	0.02	0.02	bdl	bdl	0.05	0.02	bdl	100.03
Py3	zk2905g3-9	53.34	46.85	0.03	bdl	bdl	0.01	0.01	bdl	bdl	bdl	0.03	0.07	100.33
Py3	zk2905g3-10	53.37	46.46	0.02	bdl	bdl	0.01	bdl	bdl	bdl	0.02	0.01	bdl	99.91
Py3	zk2905g3-11	53.40	46.43	0.03	bdl	0.05	0.03	0.04	0.02	bdl	0.03	0.02	bdl	100.04
Py3	zk2905g3-12	53.42	46.66	0.03	bdl	0.08	0.03	bdl	bdl	0.10	bdl	0.05	0.06	100.41
Py3	zk2905g3-13	53.47	46.62	0.04	bdl	bdl	0.02	bdl	bdl	bdl	bdl	0.01	bdl	100.16
Py3	zk2905g3-14	53.53	46.88	0.04	bdl	0.02	0.01	bdl	0.03	0.03	0.01	0.04	0.01	100.60
Py4	zk2905g5-2-1	53.59	47.05	0.03	0.04	bdl	0.01	bdl	0.03	0.06	bdl	bdl	bdl	100.81
Py4	zk2905g5-2-2	53.67	46.76	0.05	0.06	bdl	bdl	0.02	0.02	0.01	bdl	0.04	0.01	100.64
Py4	zk2905g5-2-3	53.68	46.80	0.04	0.05	0.08	0.01	0.01	bdl	bdl	bdl	0.05	bdl	100.72
Py4	zk2905g5-2-4	53.71	46.57	0.05	0.03	bdl	bdl	0.01	0.03	0.03	0.08	0.04	bdl	100.54
Py4	zk2905g5-2-5	53.75	46.47	0.03	0.01	bdl	bdl	0.01	0.03	bdl	0.01	0.02	bdl	100.34
Py4	zk2905g5-2-6	53.75	46.39	0.04	0.03	0.07	bdl	bdl	0.01	0.11	0.01	0.02	bdl	100.42
Py4	zk2905g5-2-7	53.78	46.74	0.04	bdl	bdl	bdl	bdl	bdl	0.03	bdl	0.08	bdl	100.67
Py4	zk2905g5-2-8	53.81	46.26	0.06	bdl	bdl	0.03	bdl	bdl	bdl	0.02	0.05	bdl	100.24
Py4	zk2905g5-2-9	53.85	46.81	0.08	bdl	bdl	0.02	0.01	bdl	bdl	0.08	0.04	0.03	100.90

Py4	zk2905g5-2-10	53.45	46.15	0.06	bdl	0.04	bdl	bdl	bdl	0.14	0.07	0.06	bdl	99.97
Py4	zk2905g5-2-11	53.35	46.55	0.06	0.04	bdl	bdl	0.04	bdl	0.07	0.04	0.01	bdl	100.16
Py4	zk2905g5-2-12	53.91	46.43	0.03	0.05	bdl	0.01	0.05	0.01	0.03	bdl	0.02	0.01	100.54
Py4	zk2905g5-2-13	52.76	46.27	0.13	0.17	0.10	0.02	bdl	bdl	0.04	bdl	0.06	bdl	99.56
Py4	zk2905g5-2-14	53.16	46.49	0.06	bdl	0.04	bdl	bdl	bdl	0.10	0.04	0.01	bdl	99.89

Table S2. LA-ICP-MS analyses of pyrite grains from the different stages in the Sanhetun Te-Au deposit (all values in ppm).

Stage	Sample No.	Ti	Mn	Co	Ni	Cu	Zn	Ge	As	Se	Mo	Ag	Cd	Sb	Te	Au	Tl	Bi	Pb
Py1	zk2904g7-1	1.35	0.00	34.42	24.56	0.00	0.28	4.86	0.00	0.00	0.16	0.00	0.19	0.02	0.22	0.01	0.01	0.01	0.02
Py1	zk2904g7-2	6.17	0.85	380.43	176.43	0.99	0.60	4.33	0.00	2.26	0.08	0.61	0.08	0.08	8.81	0.08	0.00	0.23	1.11
Py1	zk2904g7-3	5.59	0.11	26.51	31.80	7.12	0.18	4.79	4.97	0.00	0.04	5.08	0.06	0.85	21.36	2.11	0.05	2.53	18.90
Py1	zk2904g7-4	1.55	0.00	0.21	0.00	0.02	0.46	4.34	2.09	1.24	0.09	0.06	0.00	0.05	0.02	0.01	0.00	0.00	1.59
Py1	zk2904g7-5	2.63	0.00	8.16	4.21	1.21	0.71	4.64	0.52	2.08	0.05	0.01	0.00	0.00	4.63	0.02	0.02	0.06	0.19
Py1	zk2904g7-6	2.14	0.10	61.71	61.14	5.16	0.76	4.87	2.98	0.67	0.09	3.22	0.00	0.13	9.99	1.15	0.00	1.04	8.18
Py1	zk1001g2-1	0.93	0.00	102.41	16.64	0.74	0.62	5.16	12.85	2.02	0.04	1.20	0.01	0.08	4.06	0.15	0.01	1.36	2.17
Py1	zk1001g2-3	4.15	0.05	11.09	8.67	1.46	0.77	4.73	0.81	3.34	0.07	0.06	0.00	0.00	0.65	25.49	0.02	0.04	0.14
Py1	zk1001g2-4	1.21	0.00	53.04	24.08	0.78	0.14	4.23	2.44	0.69	0.08	0.79	0.00	0.00	2.08	0.29	0.00	0.16	1.38
Py2	zk2905g5-1-1	56.59	40.39	14.31	11.95	36.67	3.54	4.97	1784.14	2.73	163.94	20.18	0.38	14.85	117.89	8.59	0.28	61.29	215.34
Py2	zk2905g5-1-2	17.05	152.54	22.61	28.74	111.99	6.12	4.41	276.23	3.63	436.09	22.97	3.33	26.11	81.84	5.60	2.15	76.29	262.73
Py2	zk2905g5-1-3	18.30	40.62	20.29	23.37	74.76	4.60	4.55	350.11	1.96	282.92	18.59	0.96	11.83	73.66	5.65	0.55	60.60	217.15
Py2	zk2905g5-1-4	87.94	11.32	9.40	13.68	64.72	3.64	4.59	535.52	4.02	572.19	10.94	0.26	9.81	51.69	4.21	0.43	40.09	115.95
Py2	zk2905g5-1-5	4.66	7.87	3.55	6.65	59.57	3.45	4.33	59.24	0.84	625.39	4.87	0.66	4.65	11.43	2.03	0.67	10.15	40.36
Py2	zk2905g5-1-6	20.84	10.13	15.20	20.55	93.19	5.18	4.45	173.18	0.00	243.14	12.24	1.94	10.60	50.42	3.70	0.88	48.08	151.22
Py2	zk2905g5-1-7	60.30	6.60	15.08	15.86	57.98	3.84	4.93	372.96	0.31	436.00	9.84	1.34	16.28	35.50	3.16	0.81	40.76	163.58
Py2	zk2905g5-1-8	691.12	10.16	22.02	40.89	64.56	2.92	5.00	1194.13	1.04	359.57	5.60	1.00	53.07	26.45	3.12	2.06	10.98	369.50
Py2	zk2905g5-1-9	222.14	10.32	54.32	38.51	98.48	2.83	4.56	731.53	2.24	231.95	30.27	1.60	36.48	142.43	7.57	3.29	128.55	335.56
Py2	zk2905g5-1-10	102.91	16.09	15.77	18.57	62.97	5.81	5.17	213.34	1.06	286.36	21.23	2.66	19.07	75.39	4.73	1.99	81.51	142.46
Py3	zk1001g2-2	5.88	0.25	46.61	7.35	25.46	1.07	5.72	5.92	0.19	0.01	282.66	0.02	0.32	284.80	47.07	0.03	28.66	43.02
Py3	zk2905g3-1	1.58	0.00	0.20	18.43	414.41	0.56	4.13	3.15	0.85	0.07	1253.20	4.83	0.44	2021.51	250.14	0.03	104.29	8651.72
Py3	zk2905g3-2	1.50	0.21	0.36	87.78	44.87	0.44	4.60	6.01	4.21	0.06	542.55	2.44	0.98	716.70	99.76	0.05	80.14	4418.70
Py3	zk2905g3-3	1.51	0.00	0.41	83.01	62.20	0.54	4.66	3.78	0.75	0.18	1758.18	0.06	0.29	2801.51	440.79	0.00	26.64	209.25
Py3	zk2905g3-4	1.65	0.00	0.07	31.93	20.25	0.22	4.56	3.22	2.13	0.00	9.47	0.00	0.33	36.91	1.51	0.00	0.61	33.03
Py3	zk2905g3-5	1.06	0.23	0.43	21.37	7.54	0.49	4.89	0.00	1.77	0.07	1.93	0.49	0.20	17.60	0.36	0.01	0.92	15.79
Py3	zk2905g3-6	1.14	0.95	0.28	57.51	66.36	0.72	4.77	4752.33	0.77	0.08	598.01	0.36	18.00	1342.73	150.31	0.08	196.02	368.74
Py4	zk2905g5-1	2.25	0.00	3.67	3.36	9.63	0.43	4.17	5.99	2.00	0.02	1.16	0.02	0.00	17.07	0.60	0.00	19.27	21.63
Py4	zk2905g5-2	1.15	0.18	8.44	3.80	22.39	0.52	4.09	7.44	4.39	0.06	87.08	0.06	0.06	166.87	10.62	0.02	139.45	36.26
Py4	zk2905g5-3	1.94	0.14	12.39	5.11	13.79	0.45	5.09	5.61	3.87	0.00	3.78	0.11	0.12	35.95	1.14	0.00	40.94	40.93
Py4	zk2905g5-4	1.88	0.28	5.26	2.25	5.98	0.63	4.97	4.59	2.92	0.04	1.40	0.00	0.00	15.23	0.31	0.01	13.41	20.18
Py4	zk2905g5-5	2.00	0.07	21.68	4.83	6.69	0.68	4.75	3.33	2.25	0.02	1.29	0.00	0.10	19.05	0.24	0.00	10.73	13.66