

Supplementary Table. Trace element data (ppm) of scheelite from the Shimensi tungsten deposit.

Element	DHT91						DHT96						DHT198					
	1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	1	2
Ti	0.78	0.68	2.79	0.43	0.36	0.57	--	0.20	0.10	--	--	0.15	0.23	0.18	0.35	0.15	0.13	--
Sr	65.36	62.02	63.42	94.96	120.80	102.79	365.82	285.88	426.69	329.45	357.89	330.71	367.93	460.06	196.03	419.36	270.82	300.70
Y	532.92	774.43	802.65	676.20	177.57	732.29	120.63	124.59	87.53	140.12	114.05	124.02	124.82	94.78	167.17	137.05	174.46	201.88
Nb	27.30	30.06	34.98	95.07	49.55	72.96	4.91	3.87	2.65	3.26	2.57	2.66	9.53	2.45	5.70	14.72	2.99	3.89
Mo	2.59	3.49	3.10	294.40	2.43	259.24	107.53	123.79	143.81	132.68	156.16	138.72	108.20	163.74	150.54	156.55	149.29	142.03
Ba	0.09	0.28	0.05	0.06	0.13	0.12	0.14	0.16	0.15	0.12	0.14	0.52	0.14	0.13	0.55	0.08	0.04	0.05
La	83.05	60.37	63.71	151.27	55.32	165.75	65.90	70.19	83.99	84.14	79.27	74.34	56.95	74.91	96.62	95.77	107.63	126.86
Ce	325.10	299.43	307.65	459.94	136.19	489.20	140.39	149.10	142.07	167.06	147.08	150.63	137.81	125.18	187.82	152.35	282.20	311.58
Pr	43.78	53.56	54.99	61.89	16.23	61.22	17.37	17.30	13.12	18.55	15.73	16.98	19.12	12.47	20.45	15.07	36.50	37.55
Nd	161.38	284.29	301.33	296.27	63.70	281.31	71.81	66.25	40.03	67.31	56.17	63.23	91.32	43.99	75.62	55.45	146.72	137.56
Sm	35.28	96.66	98.13	86.68	14.68	75.07	19.47	14.90	7.63	14.78	12.82	14.10	25.71	9.11	17.32	15.51	34.90	31.12
Eu	16.55	18.97	23.39	15.12	8.44	17.85	13.70	9.40	7.27	11.34	7.84	9.11	11.18	7.50	8.91	7.72	11.35	11.64
Gd	35.33	121.32	127.75	106.28	13.82	91.01	20.52	14.56	6.77	14.45	11.95	13.90	29.27	8.22	17.18	17.47	33.15	28.40
Tb	8.50	25.92	26.63	21.61	3.14	19.41	4.08	2.88	1.42	2.87	2.33	2.72	5.41	1.63	3.53	3.36	6.32	5.71
Dy	69.59	192.93	198.23	157.81	27.95	147.49	26.64	18.67	9.81	19.25	15.34	18.11	33.51	10.69	23.34	20.89	38.77	37.53
Ho	15.50	39.04	41.14	31.31	6.94	31.59	5.43	3.88	2.14	4.17	3.18	3.86	6.86	2.34	4.80	4.22	7.75	7.97
Er	52.50	108.34	114.75	87.11	28.43	90.95	14.67	10.91	6.88	12.19	9.07	11.17	17.05	7.11	13.88	11.58	19.95	22.14
Tm	7.98	13.00	13.70	10.51	5.57	12.04	2.16	1.86	1.28	2.16	1.62	1.86	2.23	1.34	2.36	1.97	2.71	3.22
Yb	49.87	70.19	74.48	64.86	50.64	76.39	14.63	15.30	10.83	16.91	13.65	15.49	15.83	12.66	19.09	16.98	15.87	19.26
Lu	5.39	7.04	7.91	6.93	7.65	8.53	1.96	2.16	1.56	2.41	1.98	2.26	2.06	2.03	2.66	2.67	2.11	2.39
Ta	6.71	7.22	7.46	8.89	8.52	9.38	9.33	9.04	9.40	9.34	9.72	9.77	9.86	9.78	9.94	10.57	7.92	8.17

ΣREE	909.80	1391.06	1453.79	1557.59	438.70	1567.81	418.73	397.36	334.80	437.59	378.03	397.76	454.31	319.18	493.58	421.01	745.93	782.93
LaN/YbN	699.04	2144.15	2216.90	1900.42	282.02	1636.60	395.76	291.63	142.31	289.36	245.07	277.19	543.16	171.34	341.55	325.93	673.47	588.63
δEu	1.42	0.54	0.64	0.48	1.79	0.66	2.08	1.93	3.03	2.35	1.91	1.97	1.24	2.60	1.56	1.43	1.01	1.18

Continued Table 1

Element	DHT198									DHT202									
	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	
Ti	--	0.51	0.38	--	--	0.30	0.18	0.73	31.65	0.19	0.63	0.68	0.75	--	0.10	--	0.20	0.29	
Sr	289.77	356.38	182.41	369.23	216.84	274.81	191.87	283.14	159.42	189.28	155.95	76.74	53.21	169.47	29.31	185.20	161.29	192.93	
Y	185.78	156.88	255.49	166.71	186.56	227.15	234.71	230.18	185.34	74.33	214.71	622.05	724.72	326.02	876.26	165.45	190.38	346.95	
Nb	3.49	3.96	5.56	3.82	4.39	3.57	4.13	3.79	19.41	9.33	20.00	149.28	145.10	50.54	111.71	14.87	24.25	27.87	
Mo	145.21	129.60	133.86	133.34	137.80	149.82	143.02	145.11	68.06	84.54	95.69	28.76	42.40	82.48	68.80	96.24	94.72	102.55	
Ba	0.10	0.05	0.05	0.06	0.02	0.05	0.11	0.14	0.06	<0.011	0.03	0.05	0.02	0.06	0.08	0.02	0.02	0.05	
La	120.68	98.56	109.16	103.40	95.05	122.21	109.89	124.02	787.42	125.71	227.67	99.54	120.78	335.44	103.87	235.75	315.19	444.19	
Ce	309.60	291.25	294.16	245.75	255.72	409.60	331.53	400.69	1234.60	181.02	344.31	367.22	436.75	660.60	365.85	348.94	456.65	726.69	
Pr	38.48	44.08	37.67	28.36	33.29	65.89	49.72	63.98	98.26	14.17	32.47	63.06	72.42	69.13	62.61	26.64	35.50	64.25	
Nd	145.05	221.08	150.65	105.19	134.55	329.71	231.80	329.86	264.77	35.49	107.02	348.53	393.34	230.87	337.16	63.91	87.91	190.98	
Sm	31.79	54.19	36.84	23.85	32.63	79.35	58.55	81.94	40.79	6.15	20.89	124.64	132.27	50.82	116.93	10.25	14.60	38.35	
Eu	11.19	11.32	15.39	13.90	12.39	20.15	15.86	21.33	13.89	6.03	14.18	7.49	6.46	22.24	6.04	12.97	10.83	20.39	
Gd	29.83	53.41	36.50	22.48	30.79	77.30	56.22	79.96	28.78	4.75	17.09	149.16	161.59	41.40	147.53	8.04	10.54	31.89	
Tb	5.98	8.80	7.42	4.72	6.12	12.75	10.37	12.94	5.15	0.95	3.08	27.46	30.34	8.30	29.73	1.60	2.12	6.24	
Dy	38.44	52.07	49.62	30.22	39.16	75.24	61.51	75.28	30.28	6.12	19.50	165.73	188.64	50.64	199.11	10.67	13.57	39.70	
Ho	7.98	10.26	10.51	6.56	7.79	14.90	12.33	14.80	5.70	1.33	4.14	31.75	38.15	9.95	43.61	2.35	2.90	8.30	
Er	22.23	23.97	30.18	18.58	21.68	35.20	30.46	34.77	15.19	4.26	12.97	75.70	91.89	26.82	113.11	7.96	9.29	25.44	
Tm	2.94	2.85	4.52	3.03	3.15	3.97	3.82	3.97	2.59	0.87	2.55	9.05	10.61	4.14	13.35	1.76	2.04	4.47	
Yb	17.04	15.39	28.22	18.64	19.51	20.03	22.29	21.26	18.33	6.79	22.81	48.11	57.07	26.83	68.51	15.51	17.22	35.02	

Lu	2.07	1.71	3.49	2.40	2.38	2.33	2.83	2.62	2.37	0.96	3.20	4.82	5.97	3.02	7.49	1.95	2.23	4.16
Ta	8.69	8.75	9.01	9.45	9.06	9.18	9.73	9.19	9.06	9.02	9.62	12.73	12.40	11.90	11.21	9.98	10.54	11.01
ΣREE	783.30	888.94	814.33	627.08	694.21	1268.63	997.18	1267.40	2548.10	394.60	831.88	1522.26	1746.28	1540.20	1614.90	748.30	980.59	1640.07
LaN/YbN	609.73	1065.21	726.06	458.47	627.59	1550.70	1136.00	1602.70	678.40	107.02	374.10	2699.73	2894.70	908.20	2600.57	179.74	245.62	692.43
δEu	1.09	0.64	1.27	1.81	1.18	0.78	0.83	0.81	1.18	3.29	2.23	0.17	0.13	1.44	0.14	4.22	2.55	1.73

Continued Table 1

Element	DHT202		DHT204										DHT231					
	11	12	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6
Ti	--	0.34	0.14	0.24	0.18	--	0.38	0.13	0.42	0.09	--	0.32	1.98	1.23	0.17	--	0.08	--
Sr	198.37	35.27	144.75	168.09	174.13	156.29	173.02	159.24	124.53	198.67	195.28	178.17	105.89	106.65	88.21	408.87	1437.51	1519.24
Y	292.93	730.99	165.58	143.67	104.00	163.98	196.17	128.60	181.06	140.47	133.84	113.02	11.47	19.99	19.37	112.82	100.48	63.15
Nb	26.79	113.43	10.48	8.10	9.20	13.44	29.75	18.84	34.44	15.10	14.98	19.12	63.05	42.64	32.23	45.45	17.19	11.09
Mo	86.14	65.81	89.61	93.62	94.86	90.02	87.03	89.55	68.80	98.51	92.74	78.60	4.09	7.84	0.52	1.05	0.95	0.41
Ba	0.01	0.01	<0.0102	0.03	0.02	<0.012	0.06	<0.009	0.02	<0.007	0.04	0.03	0.07	0.06	0.02	0.10	0.11	0.11
La	297.11	88.30	206.62	211.67	140.98	301.05	280.84	164.90	143.31	305.76	244.12	165.17	28.56	12.66	48.70	70.76	83.29	83.39
Ce	546.73	347.36	213.49	200.37	165.60	318.26	422.45	251.80	270.52	468.25	392.47	274.83	27.69	26.56	87.81	105.78	100.52	82.99
Pr	52.00	61.38	13.13	10.72	10.63	19.13	36.83	20.61	27.76	36.19	34.35	24.65	2.29	2.66	6.81	8.91	7.41	4.81
Nd	163.20	340.28	26.27	19.79	21.76	38.77	106.98	55.28	86.59	85.86	93.70	70.81	6.71	8.40	15.51	23.44	19.75	9.34
Sm	34.66	118.55	3.97	2.98	3.35	5.54	22.66	11.10	17.84	13.62	17.40	12.89	1.65	2.02	2.80	8.69	5.94	2.40
Eu	26.73	5.32	12.19	11.77	7.56	9.71	13.63	7.17	10.42	10.71	10.39	8.71	1.89	1.68	3.73	10.27	7.77	6.35
Gd	29.69	147.15	3.40	2.64	2.50	4.19	17.27	8.52	14.43	9.55	12.60	10.85	1.41	2.05	2.29	10.74	6.94	2.87
Tb	5.81	28.52	0.79	0.61	0.58	1.00	3.89	1.76	3.06	1.90	2.40	2.01	0.30	0.53	0.54	3.25	1.76	0.81
Dy	37.28	184.23	5.99	5.03	4.28	7.42	25.25	11.68	20.12	12.32	14.96	13.24	2.25	4.12	4.12	24.15	12.01	6.04
Ho	7.55	38.44	1.49	1.26	1.09	1.83	4.91	2.40	4.13	2.52	2.99	2.74	0.52	0.99	0.96	4.95	2.49	1.40
Er	22.55	97.66	6.30	4.98	3.98	7.09	14.34	7.36	12.48	7.91	8.52	8.02	2.06	3.66	3.72	15.17	8.60	5.01

Tm	3.96	11.31	1.74	1.52	1.01	1.66	2.45	1.49	2.28	1.52	1.58	1.32	0.54	0.90	0.83	2.78	1.91	1.28
Yb	27.21	56.03	19.70	16.51	10.52	16.41	16.43	11.51	17.50	12.35	11.32	10.32	6.01	8.43	7.83	19.10	17.87	14.77
Lu	3.28	6.04	2.96	2.55	1.43	2.25	1.94	1.37	2.29	1.47	1.42	1.28	0.93	1.28	1.07	2.09	2.55	2.34
Ta	10.69	10.88	8.67	8.84	9.26	9.78	10.20	9.86	10.83	9.99	9.58	9.58	9.27	9.16	8.93	9.06	8.56	8.64
ΣREE	1257.76	1530.57	518.04	492.40	375.27	734.31	969.87	556.95	632.73	969.93	848.22	606.84	82.81	75.94	186.72	310.08	278.81	223.80
La _N /Yb _N	635.16	2615.15	72.74	55.54	57.30	95.40	391.69	192.55	317.68	225.82	293.17	234.16	30.20	40.29	50.14	191.28	127.13	51.97
δEu	2.49	0.12	9.91	12.57	7.67	5.93	2.03	2.17	1.93	2.73	2.05	2.19	1.25	1.41	0.84	0.97	0.77	1.14

Continued
Table 1

Element	DHT231		DHT233					DHT241									
	7	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12
Ti	--	1.25	2.73	2.98	0.44	--	0.80	0.57	0.09	0.49	--	1.00	0.20	1.18	0.34	7.99	1.22
Sr	1581.63	139.52	153.97	152.25	200.79	99.70	106.51	122.47	179.20	158.77	185.41	175.05	153.04	177.17	142.91	98.39	94.51
Y	48.87	38.08	34.38	30.38	30.44	17.49	23.92	13.75	4.86	3.75	3.80	5.94	4.50	3.18	2.72	1.45	2.88
Nb	12.89	79.98	137.65	219.04	23.81	1.60	1.39	1.47	1.65	1.30	1.29	1.96	1.65	1.54	1.58	2.02	1.55
Mo	1.23	1.14	1.11	1.54	6.84	2.77	3.76	0.81	0.97	0.61	0.39	2.21	1.31	0.73	1.49	2.69	3.01
Ba	0.12	0.12	0.08	0.15	0.27	0.02	0.45	0.02	0.02	0.11	0.02	0.60	0.33	0.07	0.24	0.64	0.25
La	65.72	76.34	101.60	109.66	39.89	23.96	28.27	18.16	25.11	15.10	15.24	25.41	16.02	19.05	9.99	2.84	4.75
Ce	66.53	98.23	92.54	100.46	53.77	53.79	57.80	53.86	42.85	28.22	20.30	56.64	34.37	35.48	16.98	4.04	8.00
Pr	4.02	6.89	5.84	6.04	4.14	6.34	6.30	7.72	4.00	2.84	1.57	6.23	3.64	3.17	1.64	0.42	0.87
Nd	7.98	17.67	14.25	14.01	11.57	24.44	22.58	33.08	12.40	9.11	4.16	21.48	12.15	8.47	4.84	1.42	3.46
Sm	2.25	2.90	2.23	2.10	1.73	5.67	5.39	8.34	1.75	1.46	0.58	3.80	2.30	1.24	0.91	0.34	0.83
Eu	4.57	2.31	2.48	2.49	1.00	2.17	2.32	2.08	0.46	0.31	0.19	0.82	0.47	0.42	0.23	0.09	0.18
Gd	2.83	2.88	2.33	2.03	2.34	4.70	4.46	6.36	1.01	0.90	0.40	2.52	1.56	0.63	0.72	0.27	0.67
Tb	0.81	0.73	0.59	0.51	0.73	0.65	0.64	0.83	0.12	0.11	0.05	0.30	0.20	0.10	0.10	0.04	0.11

Dy	5.92	6.35	4.95	4.64	6.70	3.06	3.35	3.67	0.56	0.48	0.23	1.30	0.89	0.54	0.40	0.17	0.42
Ho	1.31	1.58	1.28	1.20	1.73	0.44	0.58	0.50	0.09	0.08	0.05	0.19	0.13	0.09	0.07	0.03	0.08
Er	4.50	6.04	4.61	4.53	6.79	1.09	1.36	1.09	0.23	0.20	0.15	0.38	0.29	0.21	0.14	0.07	0.17
Tm	1.12	1.32	1.04	1.07	1.54	0.18	0.19	0.12	0.03	0.03	0.03	0.05	0.04	0.02	0.02	0.01	0.03
Yb	12.46	12.33	11.09	10.99	16.00	0.87	1.29	0.47	0.27	0.19	0.22	0.28	0.20	0.15	0.19	0.10	0.23
Lu	1.92	1.66	1.69	1.71	2.65	0.11	0.18	0.04	0.04	0.03	0.04	0.03	0.02	0.02	0.03	0.02	0.03
Ta	9.05	13.01	17.17	26.19	9.82	7.88	8.06	8.72	8.71	8.93	8.76	8.82	9.06	8.72	8.60	8.67	8.43
ΣREE	181.94	237.23	246.52	261.44	150.58	127.47	134.70	136.32	88.91	59.07	43.19	119.43	72.28	69.59	36.26	9.88	19.82
La _N /Yb _N	49.96	57.22	45.13	40.88	39.84	102.21	97.08	144.20	26.32	22.70	9.45	61.27	37.51	17.43	16.03	6.08	14.77
δEu	0.76	0.72	1.29	0.84	0.84	0.72	3.70	2.50	4.38	3.25	3.69	7.39	5.54	2.42	3.30	3.64	1.52

-- Below detection limit.