

TRACE AND MINOR ELEMENTS

As-determined (air dried) whole-coal basis

KIGAM Sample	Mine Name	Coal Field	Lab Moist	% Ash 525°C	Ag ppm	As ppm	Au ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Cd ppm	Cl %	Co ppm	Cr ppm	Cs ppm	Cu ppm	Ga ppm
1	Jang Seong	Samcheog	0.94	11.1	<0.11	3.2	<1.1	11	35	0.6	0.5	0.02	<0.015	3.8	8	0.8	27	5
2	Doe Gae	Samcheog	0.87	40.5	<0.41	3.6	<4.1	44	166	2.0	0.7	0.16	<0.015	6.8	25	6.8	29	18
3	Kyung Dong	Samcheog	1.1	27.6	0.28	4.0	<2.8	<5.5	165	1.7	1.2	<0.03	<0.015	7.0	16	3.5	73	16
4	Han Bo	Samcheog	0.88	38.3	<0.38	4.4	<3.8	9	189	2.1	0.7	0.04	<0.015	6.2	20	6.3	25	16
5	Tae Back	Samcheog	1.1	15.5	0.23	0.9	<1.6	<3.1	67	1.0	0.7	<0.02	<0.015	3.5	7	2.0	15	10
6	Sam Tan	Samcheog	0.85	17.9	0.20	2.8	<1.8	<3.6	176	1.5	0.7	<0.02	<0.015	9.1	12	4.0	41	12
7	Dong Won	Samcheog	1.6	11.1	<0.11	5.1	<1.1	<2.2	36	1.2	0.4	0.05	<0.015	3.3	4	1.7	9	5
8	Young Wol	Younwol	1.1	8.4	0.11	0.3	<0.84	5	56	0.5	0.2	<0.01	<0.015	4.6	9	1.0	11	4
9	Ma Ro	Boeoun	0.15	23.5	<0.24	2.0	<2.4	<4.7	170	1.1	0.3	0.28	<0.015	5.0	22	2.4	24	6
10	Tae Meag	Munkyoung	0.83	40.9	<0.41	5.5	<4.1	17	256	3.7	0.8	<0.04	0.018	6.5	32	6.5	10	13
11	Hwa Sun	Honam	1.4	17.1	<0.17	16.8	<1.7	<3.4	114	0.8	0.1	<0.02	<0.015	2.7	13	5.6	2	11
U.S.	average values (Finkelman, 1994)				<.01	24	<0.05	49	170	2.2	<1.0	0.47	0.0614	6.1	15	1.1	16	5.7

KIGAM Sample	Ge ppm	Hg ppm	Li ppm	Mn ppm	Mo ppm	Nb ppm	Ni ppm	Pb ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Te ppm	Th ppm	Tl ppm	U ppm	V ppm	Y ppm	Zn ppm	Zr ppm
1	0.4	0.68	35	39	1.0	1	6	12	6	1.6	3	12	1	88	0.1	2	0.1	0.4	19	4	4	20
2	0.8	0.43	42	75	2.1	8	23	30	88	0.6	9	6	6	107	0.2	12	0.6	4.1	45	7	27	59
3	0.7	0.88	118	17	4.0	12	7	28	46	1.5	14	5	6	76	0.6	16	0.4	3.0	50	11	<1	186
4	1.0	0.31	77	106	1.9	7	20	25	73	0.6	8	4	5	100	0.2	10	0.6	3.2	43	8	9	103
5	0.4	0.26	96	52	1.5	4	8	89	>31	0.3	4	6	4	104	0.2	5	0.3	1.4	19	10	9	23
6	0.7	0.61	138	14	2.8	7	11	24	>36	0.4	9	6	3	61	0.4	9	0.4	2.3	40	9	<0.7	91
7	0.1	0.03	128	15	1.4	1	8	13	20	0.3	2	14	1	55	0.1	1	0.2	0.4	12	5	8	23
8	0.3	0.04	32	10	0.3	4	13	9	14	0.1	3	21	1	70	0.1	6	0.1	1.2	13	5	4	31
9	0.7	<0.02	36	104	1.0	1	17	19	25	0.1	5	9	7	249	0.1	6	0.2	1.0	33	4	27	73
10	1.0	<0.02	14	99	1.1	4	18	3	>82	0.2	13	4	22	442	0.1	11	1.0	1.6	89	12	13	76
11	0.4	0.06	13	6	1.9	5	9	4	>34	8.3	7	9	4	97	0.3	7	0.5	1.9	32	9	1	71
U.S.	7	0.17	16	43	3.3	2.9	14	11	21	1.2	4.2	2.8	1.3	130	<0.1	3.2	1.2	2.1	22	8.5	53	27

Table 4. Trace and minor element concentrations for active coal mines of the Republic of Korea. Green indicates elevated values moderately higher than U.S. averages; red indicates significantly higher values.