

Table S2. Pb isotope compositions for sulfides in the Heihaibei gold deposit and other typical gold deposits in the EKO from the literature.

No.	Sample	Rock Type	Ore Type	Mineral	$^{206}\text{Pb}/^{204}\text{Pb}$	$^{207}\text{Pb}/^{204}\text{Pb}$	$^{208}\text{Pb}/^{204}\text{Pb}$	Ore District	References
1	HHBZK01-B3	brecciated smoky grey quartz vein	Qv2	pyrite	18.8122	15.7002	38.8055	Heihaibei	this study
2	HHBZK1002-B4	brecciated white quartz vein	Qv1	pyrite	19.0007	15.7062	38.7655	Heihaibei	this study
3	HHB08-JK08	smoky grey quartz vein	Qv2	pyrite	18.7219	15.6959	38.7356	Heihaibei	this study
4	HHB08-JK19	smoky grey quartz vein	Qv2	pyrite	18.8262	15.6998	38.7836	Heihaibei	this study
5	HHBZK01-B11	monzogranite	wall rock	K-feldspar	18.4283	15.6789	38.4342	Heihaibei	this study
6	HHBZK01-B14	granodiorite	wall rock	K-feldspar	18.4363	15.6808	38.4532	Heihaibei	this study
7	HHBZK1003-B7	granodiorite	wall rock	K-feldspar	18.4864	15.6475	38.1750	Heihaibei	this study
8	HHB01-B9	monzogranite	wall rock	K-feldspar	18.4368	15.6812	38.4598	Heihaibei	this study
9	HHB07-B1-1	granodiorite	wall rock	K-feldspar	18.3532	15.6750	38.3713	Heihaibei	this study
10	HHB07-B1-2	granodiorite	wall rock	K-feldspar	18.3537	15.6753	38.3724	Heihaibei	this study
11	K1	silicificated monzogranite	Qv1+wall rocks	pyrite	19.188	15.713	39.235	Heihaibei	[23]
12	K5	smoky grey quartz vein	Qv2	pyrite	18.722	15.695	38.728	Heihaibei	[23]
13	K12	smoky grey quartz vein	Qv2	pyrite	18.724	15.699	38.746	Heihaibei	[23]
14	ZK5601-16	phyllitic rock		pyrite	18.652	15.683	38.63	Dazaohuo	[29]
15	ZK2417-12	phyllitic rock		pyrite	18.562	15.669	38.613	Dazaohuo	[29]
16	ZK1609-5	phyllitic rock		pyrite	18.55	15.668	38.629	Dazaohuo	[29]
17	ZK1609-11	phyllitic rock		pyrite	18.41	15.631	38.445	Dazaohuo	[29]
18	ZK3209-10	phyllitic rock		pyrite	18.562	15.676	38.545	Dazaohuo	[29]
19	ZK3209-17	phyllitic rock		pyrite	18.598	15.633	38.419	Dazaohuo	[29]
20	ZK0709-8	phyllitic rock		pyrite	18.584	15.641	38.739	Dazaohuo	[29]
21	XI-3390NCM11-B1Apy	phyllitic brecciated granite		arsenopyrite	18.436	15.638	38.462	Shenshuitan	[4]
22	XI-3390NCM11-B1Po	phyllitic brecciated granite		pyrrhotite	18.402	15.605	38.374	Shenshuitan	[4]
23	XI-3390NCM11-B1Py	phyllitic brecciated granite		pyrite	18.358	15.582	38.399	Shenshuitan	[4]
24	XI-3390NCM11-B2Apy	phyllitic brecciated granite		arsenopyrite	18.254	15.600	38.201	Shenshuitan	[4]
25	XI-3390NCM11-B2Po	phyllitic brecciated granite		pyrrhotite	18.400	15.616	38.416	Shenshuitan	[4]
26	XI-3390NCM11-B2Py	phyllitic brecciated granite		pyrite	19.341	15.606	38.307	Shenshuitan	[4]
27	XI-3390NCM11-B3Apy	phyllitic brecciated granite		arsenopyrite	18.071	15.530	37.908	Shenshuitan	[4]
28	XI-3390NCM11-B3Py	phyllitic brecciated granite		pyrite	18.463	15.600	38.669	Shenshuitan	[4]

29	XI- 3390NCM17- B1Py	phyllic brecciated granite	pyrite	18.584	15.624	38.521	Shenshuitan	[4]
30	XI- 3390NCM17- B2Apy	phyllic brecciated granite	arsenopyrite	18.561	15.658	38.628	Shenshuitan	[4]
31	XI- 3390NCM17- B2Po	phyllic brecciated granite	pyrrhotite	18.555	15.651	38.702	Shenshuitan	[4]
32	XI- 3390NCM17- B2Py	phyllic brecciated granite	pyrite	18.470	15.656	38.605	Shenshuitan	[4]
33	XI- 3390NCM27- B1Py	phyllic brecciated granite	pyrite	18.530	15.650	38.581	Shenshuitan	[4]
34	XI- 3390NCM27- B2Apy	phyllic brecciated granite	arsenopyrite	18.441	15.639	38.505	Shenshuitan	[4]
35	XI- 3390NCM27- B3Apy	pyritized slate	arsenopyrite	18.459	15.629	38.459	Shenshuitan	[4]
36	XI- 3390NCM27- B3Po	pyritized slate	pyrrhotite	18.409	15.595	38.295	Shenshuitan	[4]
37	XI- 3390NCM29- B1Po	phyllic brecciated granite	pyrrhotite	18.400	15.605	38.341	Shenshuitan	[4]
38	XI- 3390NCM29- B1Py	phyllic brecciated granite	pyrite	18.398	15.620	38.401	Shenshuitan	[4]
39	XI- 3390NCM29- B2Apy	phyllic brecciated granite	arsenopyrite	18.427	15.628	38.467	Shenshuitan	[4]
40	XI- 3390NCM29- B2Py	phyllic brecciated granite	pyrite	18.440	15.644	38.517	Shenshuitan	[4]
41	XI- 3390NCM29- B3Apy	phyllic brecciated granite	arsenopyrite	18.418	15.626	38.458	Shenshuitan	[4]
42	XI- 3390NCM29- B3Py	phyllic brecciated granite	pyrite	18.444	15.655	38.554	Shenshuitan	[4]
43	XI- 3390NCM29- B4Apy	phyllic brecciated granite	arsenopyrite	18.439	15.613	38.401	Shenshuitan	[4]
44	XI- 3390NCM29- B4Po	phyllic brecciated granite	pyrrhotite	18.570	15.604	38.347	Shenshuitan	[4]
45	XI- 3390NCM29- B4Py	phyllic brecciated granite	pyrite	18.438	15.632	38.472	Shenshuitan	[4]
46	XI- 3390NCM29- B5Gn	quartz calcite vein in phyllic brecciated granite	galena	18.435	15.646	38.511	Shenshuitan	[4]
47	XI- 3390NCM29- B5Py	quartz calcite vein in phyllic brecciated granite	pyrite	18.431	15.641	38.498	Shenshuitan	[4]
48	XI- 3390NCM29- B5Sp	quartz calcite vein in phyllic brecciated granite	sphalerite	18.425	15.631	38.461	Shenshuitan	[4]

49	XI- 3390NCM29- B6Po	pyritized slate	pyrrhotite	18.483	15.669	38.667	Shenshuitan	[4]
50	XI- 3390NCM29- B6Py	pyritized slate	pyrite	18.521	15.610	38.558	Shenshuitan	[4]
51	XI- 3390NCM29- B7Gn	quartz calcite vein in phyllic brecciated granite	galena	18.418	15.627	38.449	Shenshuitan	[4]
52	XI- 3390NCM29- B7Py	quartz calcite vein in phyllic brecciated granite	pyrite	18.454	15.666	38.576	Shenshuitan	[4]
53	XI- 3390NCM29- B7Sp	quartz calcite vein in phyllic brecciated granite	sphalerite	18.425	15.632	38.467	Shenshuitan	[4]
54	XI- 3390NCM7- B1Apy	phyllic brecciated granite	arsenopyrite	18.327	15.605	38.329	Shenshuitan	[4]
55	XI- 3390NCM7- B1Po	phyllic brecciated granite	pyrrhotite	18.369	15.610	38.381	Shenshuitan	[4]
56	XI- 3390NCM7- B1Py	phyllic brecciated granite	pyrite	18.364	15.623	38.407	Shenshuitan	[4]
57	XI- 3390NCM7- B2Py	phyllic brecciated granite	pyrite	18.346	15.628	38.403	Shenshuitan	[4]
58	XI- 3390NCM7- B3Gn	pyritized slate	galena	18.373	15.673	38.541	Shenshuitan	[4]
59	XI- 3390NCM7- B3Po	pyritized slate	pyrrhotite	18.388	15.649	38.474	Shenshuitan	[4]
60	XI- 3390NCM7- B3Py	pyritized slate	pyrite	18.366	15.655	38.483	Shenshuitan	[4]
61	XI- 3390NCM7- B3Sp	pyritized slate	sphalerite	18.345	15.631	38.410	Shenshuitan	[4]
62	HLG- PD3450-3-S6	phyllic rock	pyrite	18.352	15.648	38.470	Shenshuitan	[7]
63	HLG- PD3450-25- S1	phyllic rock	pyrite	18.396	15.640	38.572	Shenshuitan	[7]
64	HLG- PD3450-19- S3	phyllic rock	pyrite	18.346	15.636	38.398	Shenshuitan	[7]
65	XI-SDNCM3- B2-1	phyllic rock	pyrite	18.449	15.639	38.523	Shenshuitan	[7]
66	XI-SDNCM3- B5	phyllic rock	pyrite	18.449	15.642	38.502	Shenshuitan	[7]
67	XI-SDNCM3- B8	phyllic rock	pyrite	18.395	15.632	38.435	Shenshuitan	[7]
68	SST-1	phyllic rock	pyrite	18.460	15.650	38.580	shenshuitan	[9]
69	SST-2	phyllic rock	Galena	18.500	15.660	38.610	shenshuitan	[9]
70	SST-3	phyllic rock	pyrite	18.250	15.600	38.180	shenshuitan	[9]
71	SST-4	phyllic rock	pyrite	18.380	15.640	38.470	shenshuitan	[9]
72	SST-5	phyllic rock	Galena	18.620	15.950	39.580	shenshuitan	[9]
73	SST-6	phyllic rock	pyrite	18.360	15.610	38.300	shenshuitan	[9]
74	SST-7	phyllic rock	Galena	18.380	15.590	38.540	shenshuitan	[9]

75	337000PD01-B2-Py	quartz vein	pyrite	18.453	15.635	38.450	Hongqigou	[60]
76	337000PD01-B3-Py	quartz vein	pyrite	18.424	15.678	38.538	Hongqigou	[60]
77	3810PD301-B1-Py	quartz vein	pyrite	18.275	15.656	38.555	Hongqigou	[60]
78	3810PD301-B1-Py	quartz vein	pyrite	18.265	15.655	38.535	Hongqigou	[60]
79	3810PD301-B3-Py	quartz vein	pyrite	18.479	15.639	38.448	Hongqigou	[60]
80	3810PD301-B4-Py	quartz vein	pyrite	18.422	15.632	38.388	Hongqigou	[60]
81	3810PD301-B5-Py	quartz vein	pyrite	18.421	15.639	38.450	Hongqigou	[60]
82	3810PD301-B6-Py	quartz vein	pyrite	18.297	15.624	38.469	Hongqigou	[60]
83	3810PD301-B7-Py	quartz vein	pyrite	18.444	15.636	38.442	Hongqigou	[60]
84	ZK63-1-22	phyllitic rock	pyrite	18.124	15.546	37.986	Guoluolongw a	[16]
85	GB3	quartz vein	pyrite	18.102	15.524	37.979	Guoluolongw a	[16]
86	GB11	quartz vein	pyrite	18.118	15.545	38.002	Guoluolongw a	[16]
87	GB30-py	quartz vein	pyrite	18.094	15.544	37.962	Guoluolongw a	[16]
88	GB31-py-1	quartz vein	pyrite	18.135	15.585	38.110	Guoluolongw a	[16]
89	GB31-py-2	quartz vein	pyrite	18.057	15.527	37.965	Guoluolongw a	[16]
90	ZK63-1-25	phyllitic rock	galena	18.093	15.542	37.905	Guoluolongw a	[16]
91	GB30-Ga	quartz vein	galena	18.106	15.563	37.919	Guoluolongw a	[16]
92	GB31-Ga	quartz vein	galena	18.099	15.559	37.901	Guoluolongw a	[16]
93	GL-53-Py	quartz vein	pyrite	18.105	15.547	38.002	Guoluolongw a	[17]
94	GL-64-Py	phyllitic rock	pyrite	18.112	15.561	37.957	Guoluolongw a	[17]
95	GL-65-Py	phyllitic rock	pyrite	18.098	15.551	37.978	Guoluolongw a	[17]
96	GW-Py	quartz vein	pyrite	18.105	15.558	37.989	Guoluolongw a	[17]
97	GL-53-Ga	quartz vein	galena	18.062	15.549	37.987	Guoluolongw a	[17]
98	GL-64-Ga	phyllitic rock	galena	18.096	15.545	37.996	Guoluolongw a	[17]
99	GL-65-Ga	phyllitic rock	galena	18.113	15.552	37.988	Guoluolongw a	[17]
100	GW-Ga	quartz vein	galena	18.101	15.546	37.999	Guoluolongw a	[17]
101	Shzg-4	quartz vein	pyrite	18.412	15.628	38.471	Kaihuangbei	[20]
102	Kx-200	phyllitic rock	pyrite	18.431	15.578	38.353	Kaihuangbei	[20]
103	dqg-1	phyllitic rock	pyrite	18.453	15.638	38.528	Kaihuangbei	[20]
104	dqg-2	quartz vein	galena	18.423	15.639	38.501	Kaihuangbei	[20]
105	BLGTC104-B1	Triassic granite	K-feldspar	18.413	15.638	38.484	Wulonggou	[7]
106	BLG-XJ-B8	Triassic granite	K-feldspar	18.411	15.634	38.496	Wulonggou	[7]
107	BLG-XJ-B9	Triassic granite	K-feldspar	18.429	15.633	38.473	Wulonggou	[7]

108	WLG-02-B01	Triassic granite	K-feldspar	18.593	15.632	38.436	Wulonggou	[7]
109	WLG-03-B01	Triassic granite	K-feldspar	18.561	15.630	38.423	Wulonggou	[7]
110	WLG-09-B01	Triassic granite	K-feldspar	18.488	15.628	38.443	Wulonggou	[7]
111	WLG-19-B1	Triassic granite	K-feldspar	18.429	15.615	38.519	Wulonggou	[7]