

# Supplementary Materials: The Source, Distribution, and Sedimentary Pattern of K-Rich Brines in the Qaidam Basin, Western China

Xiangru Zhang, Qishun Fan, Qingkuan Li, Yongsheng Du, Zhanjie Qin, Haicheng Wei and Fashou Shan

Table S1. The chemical compositions of each river in the eastern Kunlun Mountain.

River	TDS (g/L)	K <sup>+</sup>	Na <sup>+</sup>	Ca <sup>2+</sup>	Mg <sup>2+</sup> mg/L	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	HCO <sub>3</sub> <sup>-</sup>	Contributions of Each End-Member				Na/(Na + Ca)	Cl/(Cl + HCO <sub>3</sub> ) Weight Ratio
									Atmospheric Input (%)	Silicate Input (%)	Carbonate Input (%)	Evaporite Input (%)		
Wutumeiren [1]	0.70	15.60	151.80	40.80	22.08	25.92	70.08	175.68	5.32	14.93	12.14	67.62	0.79	0.55
Wutumeiren [1]	1.70	45.24	51.98	222.80	116.64	205.90	556.80	624.64	2.38	10	37.85	49.77	0.19	0.09
Wutumeiren [2]	7.00	122.07	1923.03	82.00	366.96	382.34	1033.92	1085.80	0.48	2.58	24.98	71.96	0.96	0.73
Wutumeiren [3]	0.91	17.16	195.96	38.80	30.24	35.15	95.04	256.20	4.31	14.98	14.37	66.33	0.84	0.52
Wutumeiren [3]	0.64	12.48	135.93	23.60	19.44	25.92	70.08	156.77	6.41	3.5	15.15	74.94	0.85	0.59
Wutumeiren [4]	1.28	21.06	299.92	32.00	40.08	45.44	122.88	176.29	3.12	2.91	16.65	77.31	0.9	0.75
Wutumeiren [5]	0.70	21.45	133.63	36.40	22.32	30.89	83.52	170.19	5.76	5.48	16.04	72.72	0.79	0.57
Wutumeiren [6]	1.28	33.93	356.04	55.20	79.44	76.33	206.40	111.63	2.25	3.4	24.74	69.62	0.87	0.87
Qingshui [2]	0.34	2.73	62.10	42.80	13.68	20.59	55.68	137.25	9.58	20.27	15.57	54.58	0.59	0.36
Qingshui [6]	0.54	5.07	97.98	41.20	41.28	28.05	75.84	267.79	5.86	8.99	30.53	54.62	0.7	0.34
Tuolahai [1]	1.00	7.80	21.39	146.00	40.80	90.53	244.80	162.87	4.89	1.69	42.69	50.73	0.13	0.69
Tuolahai [1]	1.00	8.19	20.93	140.80	42.96	94.08	254.40	158.60	4.93	1.79	40.63	52.65	0.13	0.7
Tuolahai [2]	0.23	1.56	35.65	33.20	7.92	13.85	37.44	82.96	14.82	0.99	24.94	59.25	0.52	0.42
Tuolahai [4]	0.72	19.11	82.11	77.20	33.12	62.48	168.96	140.91	5.43	4.57	23.74	66.25	0.52	0.59
Tuolahai [5]	0.30	2.73	62.10	42.80	13.68	20.59	55.68	173.24	9.56	20.31	15.58	54.55	0.59	0.31
Tuolahai [6]	0.98	8.97	160.31	95.20	31.68	78.81	213.12	179.95	3.96	1.58	16.55	77.91	0.63	0.6
Zaohuo [1]	1.80	10.14	17.25	141.20	44.64	97.98	264.96	323.91	4.91	2.21	39.95	52.94	0.11	0.76
Zaohuo [2]	0.41	2.34	72.22	48.40	10.80	62.13	168.00	101.87	8.87	0.98	9.84	80.3	0.6	0.56
Zaohuo [4]	0.95	9.36	225.40	77.20	27.36	60.00	162.24	132.98	3.57	1.49	13.66	81.27	0.74	0.73
Zaohuo [4]	0.40	2.34	72.22	48.40	10.80	23.08	62.40	101.87	8.87	0.92	22.55	67.66	0.6	0.55
Zaohuo [6]	3.30	42.51	660.33	180.40	144.24	330.51	893.76	182.39	1.14	5.92	22.31	70.63	0.79	0.84
Golmud [3]	0.41	3.90	52.44	32.00	24.24	14.56	39.36	183.00	9.66	32.77	22.66	34.91	0.62	0.22
Golmud [3]	0.41	3.51	55.66	39.20	18.96	15.98	43.20	164.70	9.57	30.47	18.55	41.4	0.59	0.26
Golmud [3]	0.41	3.90	51.98	32.80	24.48	16.69	45.12	172.63	9.58	26.57	24.03	39.83	0.61	0.25
Golmud [3]	0.56	3.12	76.59	44.00	39.84	5.33	14.40	199.47	6.48	0.89	52.33	40.29	0.64	0.45
Golmud [3]	0.45	3.90	59.80	38.40	24.72	19.88	53.76	192.15	8.65	28.32	21.12	41.91	0.61	0.25

Golmud [3]	0.38	3.51	53.59	30.40	21.36	17.04	46.08	141.52	10.13	26.68	21.09	42.09	0.64	0.3
Golmud [3]	0.50	3.90	83.26	36.40	18.00	21.30	57.60	223.87	8.22	57.52	5.3	28.96	0.69	0.23
Golmud [3]	0.43	3.51	55.89	38.00	23.52	17.75	48.00	180.56	9.07	23.23	24.48	43.21	0.59	0.26
Golmud [3]	0.45	3.90	68.08	20.00	35.52	25.56	69.12	150.67	8.24	24.71	33.52	33.53	0.77	0.35
Golmud [3]	0.48	4.29	69.00	41.20	24.00	22.72	61.44	173.85	8.07	26.73	18.78	46.41	0.63	0.31
Golmud [3]	0.36	4.68	40.71	41.60	15.36	16.33	44.16	162.26	11.03	34.58	18.49	35.9	0.5	0.18
Golmud [3]	0.38	4.29	50.37	32.80	20.40	16.69	45.12	162.26	10.26	40.89	17.04	31.81	0.61	0.21
Golmud [3]	0.36	3.12	34.73	32.00	19.68	15.27	41.28	184.83	11.98	15.93	30	42.09	0.52	0.19
Golmud [3]	0.37	3.90	36.80	28.40	19.44	17.75	48.00	184.83	12.2	12.25	26.74	48.81	0.56	0.21
Golmud [3]	0.63	4.29	86.71	36.80	37.68	34.08	92.16	250.10	6.53	11.54	30.39	51.53	0.7	0.32
Golmud [7]	0.34	2.73	11.73	34.40	31.92	15.62	42.24	166.53	11.67	1.36	59.35	27.62	0.26	0.16
Golmud [7]	0.39	2.73	31.51	28.80	30.24	14.91	40.32	210.45	10.73	21.24	37.69	30.34	0.52	0.13
Golmud [7]	0.11	0.78	8.28	14.00	4.32	3.91	10.56	53.07	39.92	6.65	17.46	35.97	0.37	0.2
Golmud [7]	0.52	3.12	64.40	28.00	43.44	19.88	53.76	221.43	7.32	9.43	40.83	42.42	0.7	0.29
Golmud [7]	0.39	2.73	42.55	31.20	25.20	12.43	33.60	198.25	10.39	23.17	31.13	35.3	0.58	0.19
Golmud [7]	0.52	3.51	67.39	36.40	31.68	16.33	44.16	251.93	7.74	32.16	25.23	34.87	0.65	0.21
Golmud [7]	0.51	3.12	62.10	39.20	32.16	17.04	46.08	229.36	7.81	20.17	31.61	40.4	0.61	0.24
Golmud [7]	0.48	3.12	61.87	35.60	28.80	17.04	46.08	221.43	8.32	22.07	27.12	42.49	0.64	0.25
Golmud [7]	0.44	2.73	50.37	39.60	25.92	15.62	42.24	204.35	9.02	12.02	36.41	42.55	0.56	0.25
Golmud [7]	0.44	3.12	54.51	39.20	24.00	15.27	41.28	197.03	9.05	20.9	29	41.05	0.58	0.25
Golmud [7]	0.46	3.51	54.74	42.40	24.96	15.98	43.20	210.45	8.67	14.62	34.14	42.56	0.56	0.25
Golmud [7]	0.52	3.90	69.92	42.00	24.96	16.69	45.12	252.54	7.91	31.43	20.54	40.13	0.63	0.22
Golmud [7]	0.47	3.51	55.43	42.00	25.44	16.69	45.12	216.55	8.6	13.33	34.2	43.87	0.57	0.25
Golmud [7]	0.48	3.51	55.89	42.40	26.40	17.75	48.00	222.65	8.47	14.59	33.37	43.57	0.57	0.25
Golmud [7]	0.49	3.51	58.88	42.80	26.88	18.11	48.96	217.16	8.23	17.15	31.36	43.26	0.58	0.25
Golmud [7]	0.53	4.29	69.00	46.00	28.32	22.01	59.52	226.92	7.45	12.4	31	49.15	0.6	0.29
Golmud [7]	0.50	3.12	53.82	43.20	31.20	22.01	59.52	228.14	8.07	11.44	35.83	44.67	0.55	0.24
Golmud [7]	0.82	5.07	130.18	60.00	43.68	39.41	106.56	262.30	4.65	7.94	27.47	59.94	0.68	0.42
Golmud [7]	0.64	4.29	97.06	39.60	36.72	30.89	83.52	244.61	6.16	24.27	24.94	44.63	0.71	0.32
Golmud [7]	0.60	4.29	87.63	39.60	36.96	32.31	87.36	216.55	6.44	14.14	28.73	50.68	0.69	0.35
Golmud [7]	0.60	4.29	86.94	39.60	36.96	31.95	86.40	215.94	6.46	12.34	29.26	51.93	0.69	0.36
Golmud [7]	0.58	3.90	82.11	39.60	36.72	31.95	86.40	202.52	6.64	10.19	30.16	53.01	0.67	0.36
Golmud [7]	0.50	4.68	66.93	39.60	27.60	24.50	66.24	203.13	7.9	25.12	22.96	44.02	0.63	0.27
Golmud [7]	0.54	5.07	77.74	42.00	30.24	26.98	72.96	203.13	7.11	27.14	22.24	43.52	0.65	0.3
Golmud [7]	0.60	3.90	133.86	36.00	20.88	20.24	54.72	145.18	6.12	14.79	12.68	66.41	0.79	0.56
Golmud [7]	0.51	4.68	73.14	35.20	31.68	24.85	67.20	198.25	7.5	25.1	25.83	41.57	0.67	0.3
Golmud [7]	0.86	8.97	155.71	36.80	56.16	40.12	108.48	254.98	4.28	10.98	30.77	53.97	0.81	0.46
Golmud [8]	1.83	7.41	403.42	54.80	107.28	109.34	295.68	352.58	1.97	7.32	28.08	62.64	0.88	0.63

Golmud [8]	2.35	16.77	574.08	46.80	127.68	141.65	383.04	336.11	1.51	12.31	24.63	61.56	0.92	0.71
Golmud [8]	2.91	26.13	689.31	44.00	182.64	149.10	403.20	426.39	1.2	1.39	31.14	66.27	0.94	0.72
Golmud [8]	2.96	14.04	708.17	50.80	179.04	164.01	443.52	433.71	1.19	2.81	29.73	66.27	0.93	0.71
Golmud [8]	1.09	10.14	221.49	45.60	61.92	68.52	185.28	230.58	3.34	13.6	25.69	57.37	0.83	0.57
Golmud [8]	0.96	7.80	194.81	34.40	58.08	53.25	144.00	225.09	3.8	14.49	27.21	54.49	0.85	0.54
Golmud [8]	0.93	7.80	174.80	52.00	50.64	64.97	175.68	213.50	3.96	16.93	23.68	55.43	0.77	0.52
Golmud [8]	1.01	11.31	177.10	70.40	55.44	101.89	275.52	137.86	3.59	8.42	25.62	62.37	0.72	0.65
Golmud [8]	1.82	20.67	396.52	69.20	123.60	131.00	354.24	43.92	1.83	1.69	31.87	64.61	0.85	0.95
Golmud [9]	0.70	5.85	109.02	38.40	37.68	43.31	117.12	223.87	5.81	21.92	24.55	47.72	0.74	0.38
Golmud [9]	1.00	9.75	191.36	18.00	65.28	52.54	142.08	250.10	3.88	9.01	33.19	53.92	0.91	0.53
Golmud [9]	0.50	3.90	53.36	42.80	24.48	25.56	69.12	218.38	8.77	27	21.51	42.73	0.55	0.2
Golmud [2]	0.47	4.29	80.04	40.80	33.36	31.95	86.40	214.11	6.88	6.06	28.98	58.08	0.66	0.36
Golmud [2]	0.84	9.36	170.89	48.40	61.92	60.35	163.20	280.60	3.79	10.38	30.26	55.57	0.78	0.46
Golmud [4]	7.78	7.02	125.58	44.80	47.76	46.15	124.80	249.49	4.88	8.82	29.84	56.46	0.74	0.42
Golmud [4]	0.73	8.19	137.54	40.40	42.24	35.15	95.04	242.17	4.93	24.83	22.82	47.42	0.77	0.41
Golmud [6]	5.10	67.08	1201.75	54.80	320.64	541.73	1464.96	448.96	0.69	15.15	28.84	55.32	0.96	0.79
Golmud [6]	0.56	5.85	103.04	39.20	43.44	35.50	96.00	258.64	5.67	10.07	31.09	53.17	0.73	0.36
Golmud [1]	0.70	28.47	76.82	58.00	145.20	33.73	91.20	244.61	3.03	3.83	35.81	57.33	0.57	0.36
Golmud [1]	0.70	34.71	8.51	50.00	70.80	36.21	97.92	249.49	5.99	9.21	30.14	54.65	0.15	0.35
Golmud [1]	0.80	33.15	8.97	50.80	67.92	39.05	105.60	264.74	6.13	9	27.73	57.13	0.15	0.35
Golmud [1]	0.80	44.46	12.65	64.00	79.68	58.93	159.36	259.86	5.02	9.89	25.42	59.67	0.17	0.45
Golmud [1]	0.90	37.05	14.03	70.00	101.04	71.36	192.96	257.42	4.29	7.05	30.61	58.05	0.17	0.45
Golmud [1]	1.80	33.15	8.97	50.40	66.96	39.05	105.60	264.74	6.19	9.1	27.28	57.43	0.15	0.35
Golmud [1]	2.10	76.05	56.58	102.00	156.00	107.57	290.88	245.83	2.57	8.66	26.64	62.13	0.36	0.83
Golmud [1]	3.20	88.14	80.04	142.40	237.36	131.00	354.24	184.22	1.77	6.92	29.83	61.47	0.36	0.92
Nuomuhong [1]	1.00	5.85	205.85	73.60	32.40	71.36	192.96	126.27	3.74	0.97	15.83	79.47	0.74	0.72
Qaidam [1]	0.50	3.90	100.51	44.80	22.56	30.53	82.56	176.29	6.73	8.31	17.67	67.29	0.69	0.45
Chahanwusu [1]	0.60	5.85	135.01	74.80	19.20	36.92	99.84	185.44	5.09	1.32	23.86	69.73	0.64	0.55
Sulinguole [1]	0.60	3.12	100.97	54.00	17.04	31.24	84.48	195.81	6.73	7.31	17.62	68.34	0.65	0.43
Nalenggele [1]	1.10	15.21	15.18	141.60	49.20	138.81	375.36	254.98	4.73	3.19	31.48	60.6	0.1	0.46
Nalenggele [1]	1.30	14.82	16.10	230.40	42.96	197.74	534.72	214.11	3.58	2.35	21.08	73	0.07	0.51
Nalenggele [2]	0.57	12.09	137.54	40.00	19.68	71.00	192.00	170.80	5.82	8.99	12.72	72.48	0.77	0.54
Nalenggele [3]	0.71	10.92	147.89	42.00	25.20	29.47	79.68	195.20	5.31	12.48	14.72	67.49	0.78	0.52
Nalenggele [3]	0.65	14.82	146.97	33.60	21.36	22.37	60.48	178.12	5.66	22.94	10.76	60.64	0.81	0.52
Nalenggele [3]	0.70	12.48	141.91	42.00	25.92	31.24	84.48	175.07	5.38	6.52	17.02	71.08	0.77	0.55
Nalenggele [1]	1.46	19.89	384.10	62.40	33.36	70.29	190.08	242.17	2.5	19.65	7.11	70.74	0.86	0.69
Snow water [2]	0.05	0.39	0.69	12.00	3.60	0.00	0.00	59.17						
Snow water [2]	0.02	0.00	0.46	0.00	2.40	0.00	0.00	17.69						

**Table S2.** The chemical compositions of different types of brines in the QB.

Name	K <sup>+</sup> (g/L)	Na <sup>+</sup> (g/L)	Cl <sup>-</sup> (g/L)	Ca <sup>2+</sup> (g/L)	Na/Cl	Ca/Cl	TDS (g/L)	Brine type
Da Qaidam Lake [5]	3.22	88.37	155.89	0.45	0.57	0.003	274.44	Surface brine
Xiao Qaidam Lake [5]	3.52	106.39	183.46	0.42	0.58	0.002	339.07	Surface brine
Jiahu Lake [5]	5.48	4.10	293.41	10.82	0.01	0.037	469.12	Surface brine
Xitai Lake [5]	6.90	103.27	188.05	0.29	0.55	0.002	336.33	Surface brine
Dongtai Lake [5]	3.79	116.45	187.04	0.43	0.62	0.002	331.53	Surface brine
Balunmahai Lake [5]	2.42	103.19	193.27	3.67	0.53	0.019	313.99	Surface brine
Dezongmahai Lake [5]	3.16	107.43	175.42	0.18	0.61	0.001	355.16	Surface brine
Dabuxun Lake [5]	0.71	0.80	342.83	0.08	0.00	0.001	470.18	Surface brine
Tuanjie Lake [5]	7.22	5.80	273.40	0.01	0.02	0.001	425.27	Surface brine
Xiezu Lake [5]	7.72	16.00	252.02	17.66	0.06	0.070	358.49	Surface brine
Senie Lake [5]	7.27	94.50	189.14	0.27	0.50	0.001	332.25	Surface brine
Xiaobiele Lake [5]	18.93	10.95	262.10	0.08	0.04	0.001	386.92	Surface brine
Dabiele Lake [5]	8.47	81.97	177.49	1.01	0.46	0.006	362.89	Surface brine
Nanyishan-1 [10]	4.20	105.70	194.50	12.92	0.54	0.066	326.50	Intercrystalline brine
Nanyishan-2 [10]	3.89	106.60	195.70	12.88	0.54	0.066	327.00	Intercrystalline brine
Mangai Playa [10]	3.78	111.50	187.30	0.55	0.60	0.003	320.20	Intercrystalline brine
Kunteyi Playa [10]	11.63	108.20	175.00	0.41	0.62	0.002	365.50	Intercrystalline brine
Chahansilatuy Playa [10]	2.07	113.80	192.50	6.74	0.59	0.035	319.80	Intercrystalline brine
Chaka Playa [5]	4.47	80.23	187.70	0.13	0.43	0.001	322.49	Intercrystalline brine
Keke Playa [5]	4.62	80.05	190.52	0.23	0.42	0.001	326.38	Intercrystalline brine
Kunteyi Playa [5]	12.22	53.77	216.86	7.28	0.25	0.034	328.92	Intercrystalline brine
Xitai Playa [5]	8.44	101.18	183.50	0.20	0.55	0.001	344.64	Intercrystalline brine
Yiliping Playa [5]	11.02	53.77	216.86	7.28	0.25	0.034	327.24	Intercrystalline brine
Bieletan Playa [5]	23.18	23.34	239.85	0.43	0.10	0.002	358.00	Intercrystalline brine
Dabuxun Playa [5]	19.04	41.87	219.67	2.19	0.19	0.010	331.85	Intercrystalline brine
Qarhan Playa [5]	12.11	71.36	201.56	1.02	0.35	0.005	321.46	Intercrystalline brine
Huobuxun Playa [5]	2.96	83.34	198.45	3.70	0.42	0.019	311.24	Intercrystalline brine
Heibei-ZK3608 [11]	6.76	93.33	176.76	0.80	0.53	0.005	298.65	Intercrystalline brine
Heibei-ZK3610 [11]	8.82	84.74	176.53	0.00	0.48	0.001	314.73	Intercrystalline brine
Heibei-ZK3612 [11]	9.21	83.71	187.51	0.32	0.45	0.002	332.77	Intercrystalline brine
Heibei-ZK4008 [11]	5.92	93.92	186.29	1.13	0.50	0.006	308.17	Intercrystalline brine
Heibei-ZK4010 [11]	4.65	93.45	188.50	2.24	0.50	0.012	305.70	Intercrystalline brine
Heibei-ZK4406 [11]	7.66	86.68	191.70	0.83	0.45	0.004	313.06	Intercrystalline brine
Heibei-ZK4408 [11]	8.80	82.00	186.17	0.26	0.44	0.001	335.23	Intercrystalline brine
Heibei-ZK5206 [11]	8.50	90.16	193.46	0.71	0.47	0.004	320.67	Intercrystalline brine
Youquanzi-ZK0803 [12]	6.22	94.00	187.05	2.43	0.50	0.013	301.60	Intercrystalline brine
Youquanzi-ZK1003 [12]	6.00	97.00	184.95	1.89	0.52	0.010	300.15	Intercrystalline brine
Youquanzi-ZK1005 [12]	4.16	106.75	190.50	1.75	0.56	0.009	312.55	Intercrystalline brine
Youquanzi-ZK1201 [12]	2.71	112.25	174.87	0.28	0.64	0.002	312.75	Intercrystalline brine
Youquanzi-ZK1203 [12]	11.20	82.00	186.70	1.54	0.44	0.008	301.10	Intercrystalline brine
Youquanzi-ZK1205 [12]	9.22	89.00	182.85	1.42	0.49	0.008	300.50	Intercrystalline brine
Youquanzi-ZK1401 [12]	3.68	112.00	171.25	0.22	0.65	0.001	320.15	Intercrystalline brine
Youquanzi-ZK1405 [12]	5.58	96.50	180.20	0.42	0.54	0.002	307.25	Intercrystalline brine
Youquanzi-ZK1602 [12]	6.40	113.00	180.70	0.19	0.63	0.001	342.70	Intercrystalline brine
Youquanzi-ZK1604 [12]	1.00	119.00	181.50	0.33	0.66	0.002	320.80	Intercrystalline brine
Youquanzi-ZK0602 [12]	3.28	75.50	141.80	3.19	0.53	0.022	233.00	Intercrystalline brine
Youquanzi-ZK0803 [12]	7.09	92.67	184.47	1.62	0.50	0.009	299.70	Intercrystalline brine
Youquanzi-ZK1001 [12]	5.64	100.00	189.10	0.82	0.53	0.004	311.00	Intercrystalline brine
Youquanzi-ZK1003 [12]	4.96	106.50	176.60	0.26	0.60	0.001	318.50	Intercrystalline brine
Youquanzi-ZK1005 [12]	4.12	98.00	173.80	1.64	0.56	0.009	286.90	Intercrystalline brine

Youquanzi-ZK1203 [12]	7.47	95.50	175.25	0.42	0.54	0.002	304.35	Intercrystalline brine
Youquanzi-ZK1205 [12]	9.30	88.00	185.40	0.95	0.47	0.005	305.35	Intercrystalline brine
Youquanzi-ZK1403 [12]	2.93	113.83	174.98	0.26	0.65	0.001	318.38	Intercrystalline brine
Youquanzi-ZK1405 [12]	4.68	106.00	175.60	0.26	0.60	0.001	316.30	Intercrystalline brine
Youquanzi-ZK1604 [12]	1.36	109.00	165.20	0.24	0.66	0.001	300.30	Intercrystalline brine
Mahai-ZK2413 [13]	0.82	86.83	157.67	5.93	0.55	0.038	257.97	Pore brine
Mahai-ZK3212 [13]	1.74	87.86	161.07	4.55	0.55	0.028	264.04	Pore brine
Mahai-ZK4007 [13]	2.57	78.43	146.81	3.19	0.53	0.022	241.71	Pore brine
Mahai-ZK4010 [13]	2.55	77.38	144.73	3.20	0.53	0.022	239.91	Pore brine
Mahai-ZK5608 [13]	3.03	91.15	172.70	4.21	0.53	0.024	280.73	Pore brine
Mahai-ZK5602 [13]	3.71	103.24	188.51	3.34	0.55	0.018	308.43	Pore brine
Mahai-ZK7212 [13]	2.58	79.71	153.22	4.28	0.52	0.028	249.54	Pore brine
Mahai-ZK7212 [13]	5.68	101.20	190.30	1.66	0.53	0.009	313.01	Pore brine
Heibei-ZK03 [14]	1.88	80.40	144.20	4.61	0.56	0.032	237.27	Pore brine
Heibei-ZK05 [14]	3.41	102.30	183.60	5.42	0.56	0.030	302.00	Pore brine
Heibei-ZK07 [14]	1.16	114.50	184.90	3.53	0.62	0.019	309.00	Pore brine
Heibei-ZK02 [14]	2.52	96.08	175.20	5.46	0.55	0.031	282.00	Pore brine
Youdunzi [10]	2.50	117.80	192.20	4.84	0.61	0.025	320.40	Oilfield brine
Youdunzi [10]	1.84	116.70	191.80	4.45	0.61	0.023	318.90	Oilfield brine
Youquanzi [10]	0.78	167.10	176.20	13.60	0.95	0.077	379.00	Oilfield brine
Youquanzi [10]	0.60	187.50	179.60	13.50	1.04	0.075	383.80	Oilfield brine
Kaitemilike [10]	0.25	113.10	98.74	2.62	1.15	0.027	220.40	Oilfield brine
Kaitemilike [10]	0.35	124.30	76.55	2.35	1.62	0.031	208.10	Oilfield brine
Shizigou 01 [15]	0.21	23.26	34.62	0.23	0.67	0.007	61.22	Oilfield brine
Shizigou 02 [15]	0.45	24.37	42.51	0.94	0.57	0.022	76.62	Oilfield brine
Shizigou 03 [15]	0.83	94.73	143.22	0.77	0.66	0.005	247.15	Oilfield brine
Sgizigou 04 [15]	0.25	41.85	65.12	1.41	0.64	0.022	113.55	Oilfield brine
Youquanzi 01 [15]	0.72	78.04	124.94	2.33	0.62	0.019	210.95	Oilfield brine
Youquanzi02 [15]	0.66	75.94	121.31	1.99	0.63	0.016	204.88	Oilfield brine
Youquanzi 03 [15]	0.69	78.66	126.24	2.51	0.62	0.020	214.13	Oilfield brine
Youquanzi 04[15]	0.69	78.92	129.01	3.10	0.61	0.024	218.00	Oilfield brine
Youquanzi 05 [15]	0.76	71.45	125.17	5.31	0.57	0.042	207.56	Oilfield brine
Youdunzi 01 [15]	1.71	116.80	189.35	4.42	0.62	0.023	316.00	Oilfield brine
Gasikule 01 [15]	0.30	25.68	43.82	1.82	0.59	0.042	73.42	Oilfield brine
Gasikule 02 [15]	0.77	23.97	124.30	0.29	0.19	0.002	189.77	Oilfield brine
Gasikule 03 [15]	0.82	29.04	47.14	1.45	0.62	0.031	80.40	Oilfield brine
Gasikule 04 [15]	0.43	21.81	33.98	0.83	0.64	0.024	59.55	Oilfield brine
Gasikule 05 [15]	0.48	28.41	45.16	1.22	0.63	0.027	77.75	Oilfield brine
Dafengshan 01 [15]	1.28	60.09	103.82	4.88	0.58	0.047	173.25	Oilfield brine
Dafengshan 02 [15]	1.62	58.99	102.05	4.84	0.58	0.047	170.52	Oilfield brine
Xiaoliangshan 01 [15]	1.05	58.91	90.61	1.54	0.65	0.017	157.98	Oilfield brine
Xiaoliangshan 02 [15]	1.68	84.80	130.34	1.90	0.65	0.015	227.51	Oilfield brine
Xiaoliangshan 03 [15]	0.29	62.92	100.16	2.43	0.63	0.024	170.56	Oilfield brine
Xiaoliangshan 04 [15]	0.39	65.22	103.42	2.66	0.63	0.026	177.73	Oilfield brine
Xiaoliangshan 05 [15]	5.52	76.51	148.18	0.26	0.52	0.002	260.25	Oilfield brine
Xiaoliangshan 06 [15]	2.16	56.49	90.76	0.27	0.62	0.003	155.76	Oilfield brine
Xiaoliangshan 07 [15]	0.62	61.12	98.54	1.98	0.62	0.020	167.09	Oilfield brine
Hongliuquan 01 [15]	0.68	56.66	86.22	0.96	0.66	0.011	149.46	Oilfield brine
Hongliuquan 02 [15]	0.61	62.19	93.72	0.79	0.66	0.008	163.36	Oilfield brine
Hongliuquan 03 [15]	0.71	3.77	3.68	0.23	1.02	0.063	11.38	Oilfield brine
Kunbei 01 [15]	0.05	1.57	2.35	0.41	0.67	0.174	5.73	Oilfield brine
Kunbei 02 [15]	0.08	4.98	6.62	0.41	0.75	0.062	14.82	Oilfield brine
Kunbei 03 [15]	0.06	6.29	11.15	0.73	0.56	0.065	18.60	Oilfield brine

Kunbei 04 [15]	0.08	6.69	9.56	0.64	0.70	0.067	17.79	Oilfield brine
Nanyishan 01 [15]	5.68	91.72	166.67	10.95	0.55	0.066	280.19	Oilfield brine
Nanyishan 02 [15]	2.85	42.76	81.41	6.97	0.53	0.086	136.57	Oilfield brine
Nanyishan 03 [15]	8.46	82.99	159.86	13.97	0.52	0.087	269.44	Oilfield brine
Nanyishan 04 [15]	1.05	59.28	93.88	1.98	0.63	0.021	160.27	Oilfield brine
Nanyishan 05 [15]	3.70	85.77	154.20	10.51	0.56	0.068	258.67	Oilfield brine
Youshashan 01 [15]	0.37	32.72	55.96	2.55	0.58	0.046	93.26	Oilfield brine
Youshashan 02 [15]	0.22	38.11	70.32	4.62	0.54	0.066	114.80	Oilfield brine
Youshashan 03 [15]	0.34	55.28	98.92	6.05	0.56	0.061	162.30	Oilfield brine
Youshashan 04 [15]	0.72	46.34	75.98	2.63	0.61	0.035	127.83	Oilfield brine
Youshashan 05 [15]	0.03	1.83	3.27	0.24	0.56	0.073	5.59	Oilfield brine
Nanyishan [16]	7.58	85.68	169.00	15.86	0.51	0.094	282.20	Oilfield brine
Nanyishan [16]	7.66	84.33	169.30	15.83	0.50	0.094	285.00	Oilfield brine
Nanyishan [16]	5.24	87.94	176.20	14.83	0.50	0.084	286.00	Oilfield brine

## References

- Fan, Q.S.; Lowenstein, T.K.; Wei, H.C.; Yuan, Q.; Qin, Z.J.; Shan, F.S.; Ma, H.Z. Sr isotope and major ion compositional evidence for formation of Qarhan salt lake, western China. *Chem. Geol.* **2018**, *497*, 128–145.
- Yuan, J.Q.; Yang, Q.; Sun, D.P.; Huo, C.Y.; Cai, K.Q.; Wang, W.D.; Liu, X.J. *The Formation Conditions of Potash Deposit in Qarhan Salt Lake*; Geological Press: Beijing, China, 1995.
- Tan, H.B.; Chen, J.; Rao, W.B.; Zhang, W.J.; Zhou, H.F. Geothermal constraints on enrichment of boron and lithium in salt lakes: An example from a river–salt lake system on the northern slope of the eastern Kunlun Mountains, China. *J. Asian Earth Sci.* **2012**, *51*, 21–29.
- Yu, S.S.; Liu, X.Q.; Tan, H.B.; Cao, G.C. *Sustainable Utilization of Qarhan Salt Lake Resources*; Science Press: Beijing, China, 2009.
- Zhang, P.X. *Salt Lake in Qaidam Basin*; Science Press: Beijing, China, 1987.
- Yang, Q.; Wu, B.H.; Wang, S.Z.; Cai, K.Q.; Qian, Z.H. *Geology of Potassium Deposit in Qarhan Salt Lake*; Science Press: Beijing, China, 1993.
- Du, Z.M. Hydrochemical changes of waters from the upper–middle reaches of Golmud river and their influencing factors. *J. Salt Lake Res.* **2018**, *1*, 25–31.
- Tan, H.B.; Liu, X.Q.; Yu, S.S.; Lyu, Y.P. Character of Hydrochemistry in Golmud River–Dabsan Lake Water. *J. Lake Sci.* **2001**, *13*, 43–50.
- Spencer, R.J.; Lowenstein, T.K.; Casas, E.; Zhang, P.X. Origin of Potash Salts and Brines in the Qaidam Basin, China. In *Fluid–Mineral Interactions: A Tribute to H.P. Eugster. 2*; Spencer, R.J., Chou, I.M. Eds.; The Geochemical Society: San Antonio, TX, USA, 1990, pp. 395–408.
- Fan, Q.S.; Ma, H.Z.; Tan, H.B.; Li, T.W.; Xu, J.X. Hydrochemical characteristics of brines and Potassium prospecting researches in Western Qaidam Basin. *Acta Geosci. Sin.* **2007**, *5*, 446–455.
- Xiao, H.L.; Zheng, M.P.; Li, H.P. Hydrogeologic and geochemical characters of potassium–bearing brine in Heibei concave in the west of Qaidam Basin. *China Well Rock Salt.* **2017**, *5*, 23–25.
- Guo, T.F.; Li, H.P.; Hou, X.H.; Fan, F.; Ma, H.Y.; Sun, B.T. Hydrogeologic and geochemical characters of intercrystall brine in Youquanzi concave in the west of Qaidam Basin. *Contrib. Geol. Miner. Resour. Res.* **2012**, *4*, 522–527.
- Yue, X.; Liu, X.X.; Lu, L.; Zhang, X.D.; Fan, Z.L.; Yu, X.L. Hydrochemical characteristics and origin of deep pore brine deposit in Mahai Basin. *Acta Sedimentol. Sin.* **2019**, *1*, 1–12.
- Li, H.P.; Zheng, M.P.; Hou, X.H.; Sun, B.T.; Liu, G.T.; Dou, Q.C. Hydrochemistry characteristics and origin of new brine sandy gravel in early Pleistocene of Heibei concave in Qaidam Basin. *Earth Sci. J. China Univ. Geosci.* **2014**, *10*, 1433–1442.
- Li, J.S.; Li, T.W.; Peng, X.M.; Han, Y.H.; Li, Z.P.; Ma, H.Z. Hydrogeochemical behaviors of oilfield water in the Tertiary in western Qaidam Basin. *Oil Gas Geol.* **2014**, *1*, 50–61.
- Li, H.P.; Zheng, M.P.; Hou, X.H.; Yan, L.J. Control factors and water chemical characteristics of potassium–rich deep brine in Nanyishan structure of western Qaidam Basin. *Acta Geosci. Sin.* **2015**, *36*, 41–50.

