

Table 1 Kr enrichment factor and Kr recovery at different cryogenic distillation temperatures. (Related to Fig. 2)

Temperature (K)	Kr recovery %
83	90.9
108	60.0
109	52.8
110	37.9
112	27.3

Temperature (K)	Kr enrichment factor	Error
83	26.1	1.6
103	75.5	4.5
105	48.0	2.9
107	95.3	5.7
108	181.9	10.9
109	144.0	8.6
111	179.7	10.8
113	145.7	8.7

Table 2 Two gas chromatography cycles monitored by the QMS. (Related to Fig. 3)

Time (min)	He (Torr)	N ₂ (Torr)	O ₂ (Torr)	Ar (Torr)	Kr (Torr)	CH ₄ (Torr)
0	5.77E-08	2.54E-08	5.90E-09	5.66E-10	5.97E-12	1.36E-09
0.26742	2.65E-07	5.15E-07	1.44E-07	7.28E-09	1.22E-11	7.03E-09
0.53485	2.00E-07	4.29E-07	7.42E-08	4.04E-09	1.18E-11	5.77E-09
0.8023	1.68E-07	1.68E-07	2.93E-08	1.93E-09	4.11E-11	4.34E-09
1.06972	1.75E-07	2.65E-07	3.10E-08	2.40E-09	6.94E-11	4.69E-09
1.33713	1.83E-07	3.64E-07	3.32E-08	2.95E-09	7.45E-11	4.57E-09
1.60457	1.82E-07	3.13E-07	3.10E-08	2.59E-09	5.14E-11	4.52E-09
1.872	1.75E-07	1.83E-07	2.79E-08	2.27E-09	3.33E-11	4.33E-09
2.13942	1.70E-07	1.22E-07	2.60E-08	2.13E-09	2.29E-11	5.04E-09
2.40683	1.66E-07	9.84E-08	2.49E-08	1.95E-09	1.47E-11	5.70E-09
2.67427	1.64E-07	8.95E-08	2.36E-08	1.92E-09	1.26E-11	5.78E-09
2.94168	1.60E-07	8.50E-08	2.27E-08	1.98E-09	1.05E-11	5.49E-09
3.2091	1.57E-07	8.22E-08	2.14E-08	1.72E-09	1.03E-11	4.66E-09
3.47652	1.52E-07	7.96E-08	2.09E-08	1.76E-09	9.16E-12	3.98E-09
3.74393	1.48E-07	7.77E-08	2.04E-08	1.93E-09	9.18E-12	3.28E-09
4.01137	1.46E-07	7.63E-08	1.92E-08	1.65E-09	8.65E-12	3.33E-09
4.2788	1.44E-07	7.51E-08	1.89E-08	1.44E-09	8.70E-12	3.06E-09
4.54622	1.40E-07	7.53E-08	1.83E-08	2.06E-09	7.93E-12	2.85E-09
4.81362	1.33E-07	7.01E-08	1.68E-08	1.40E-09	7.91E-12	2.69E-09
5.08103	1.31E-07	6.43E-08	1.53E-08	1.17E-09	7.82E-12	2.70E-09
5.34843	1.28E-07	6.02E-08	1.48E-08	1.26E-09	7.92E-12	2.95E-09
5.61585	1.27E-07	5.98E-08	1.46E-08	1.41E-09	8.11E-12	2.73E-09

5.88328	1.25E-07	5.82E-08	1.38E-08	1.29E-09	7.91E-12	2.67E-09
6.1507	1.24E-07	5.89E-08	1.34E-08	1.44E-09	8.01E-12	2.54E-09
6.41813	1.21E-07	5.71E-08	1.33E-08	1.56E-09	7.93E-12	2.90E-09
6.68553	1.18E-07	5.84E-08	1.32E-08	1.22E-09	8.43E-12	2.82E-09
6.95297	1.18E-07	5.55E-08	1.28E-08	1.65E-09	8.00E-12	3.08E-09
7.2204	1.16E-07	5.63E-08	1.27E-08	1.31E-09	7.80E-12	2.60E-09
7.48785	1.15E-07	5.74E-08	1.24E-08	1.31E-09	8.71E-12	2.47E-09
7.75528	1.13E-07	5.75E-08	1.24E-08	1.17E-09	8.33E-12	2.57E-09
8.0227	1.12E-07	5.64E-08	1.19E-08	1.19E-09	8.60E-12	2.94E-09
8.29013	1.11E-07	5.64E-08	1.22E-08	1.51E-09	7.55E-12	2.64E-09
8.55757	1.11E-07	5.47E-08	1.17E-08	1.21E-09	8.32E-12	2.27E-09
8.825	1.11E-07	5.38E-08	1.16E-08	1.31E-09	8.19E-12	2.49E-09
9.09242	1.08E-07	5.59E-08	1.13E-08	1.25E-09	7.97E-12	2.19E-09
9.35983	1.07E-07	5.37E-08	1.13E-08	1.45E-09	8.16E-12	2.37E-09
9.62725	1.07E-07	5.33E-08	1.10E-08	1.10E-09	7.84E-12	2.06E-09
9.89465	1.07E-07	5.28E-08	1.08E-08	1.15E-09	7.42E-12	2.57E-09
10.1621	1.07E-07	5.23E-08	1.08E-08	1.20E-09	7.74E-12	2.39E-09
10.42952	1.03E-07	5.10E-08	1.49E-08	1.73E-09	7.50E-12	2.26E-09
10.69697	1.05E-07	5.24E-08	2.72E-08	2.13E-09	8.03E-12	2.56E-09
10.96442	1.04E-07	5.20E-08	1.80E-08	1.66E-09	8.12E-12	2.40E-09
11.23187	1.02E-07	5.12E-08	1.31E-08	1.41E-09	7.94E-12	2.97E-09
11.4993	1.00E-07	5.04E-08	1.14E-08	1.33E-09	7.92E-12	2.24E-09
11.76677	1.02E-07	5.15E-08	1.09E-08	1.18E-09	7.88E-12	2.18E-09
12.03427	1.00E-07	5.29E-08	9.93E-09	1.02E-09	8.12E-12	2.35E-09
12.3017	1.00E-07	2.31E-07	1.06E-08	9.61E-10	7.64E-12	2.07E-09
12.5691	1.01E-07	3.86E-07	1.09E-08	1.27E-09	8.27E-12	2.31E-09
12.83652	9.87E-08	2.22E-07	1.07E-08	1.19E-09	7.88E-12	2.00E-09
13.10392	9.82E-08	1.15E-07	1.04E-08	1.17E-09	7.37E-12	2.00E-09
13.37135	9.69E-08	7.58E-08	9.76E-09	8.69E-10	7.31E-12	2.41E-09
13.6388	9.76E-08	6.08E-08	9.66E-09	1.03E-09	7.77E-12	1.95E-09
13.90622	9.71E-08	5.50E-08	9.48E-09	9.45E-10	7.95E-12	1.83E-09
14.17367	9.47E-08	5.22E-08	9.15E-09	1.29E-09	2.41E-11	2.00E-09
14.44108	8.71E-08	4.47E-08	8.38E-09	1.14E-09	6.48E-11	1.94E-09
14.70853	9.66E-08	5.19E-08	9.43E-09	1.22E-09	7.41E-11	2.32E-09
14.97593	9.82E-08	5.03E-08	9.81E-09	1.19E-09	4.31E-11	1.93E-09
15.24337	9.74E-08	5.17E-08	9.33E-09	1.43E-09	2.30E-11	1.97E-09
15.5108	9.75E-08	5.08E-08	9.34E-09	1.02E-09	1.50E-11	2.24E-09
15.77823	9.66E-08	5.03E-08	8.99E-09	9.11E-10	1.08E-11	2.80E-09
16.04567	9.63E-08	4.99E-08	9.38E-09	1.43E-09	9.22E-12	4.02E-09
16.3131	9.61E-08	4.90E-08	9.03E-09	1.21E-09	8.77E-12	4.03E-09
16.58053	9.55E-08	4.83E-08	8.78E-09	7.35E-10	8.93E-12	2.72E-09
16.84795	9.67E-08	4.73E-08	8.68E-09	1.02E-09	8.10E-12	2.31E-09
17.11538	9.47E-08	4.87E-08	8.63E-09	7.79E-10	7.71E-12	1.93E-09
17.3828	9.49E-08	4.70E-08	8.61E-09	1.07E-09	6.73E-12	1.72E-09

Table 3 Results of the online monitoring experiment of atmospheric ^{85}Kr activities.
(Related to Fig. 4)

Number	Time	^{85}Kr activity (dpm/cc)	Error (dpm/cc)	Volume (μL)	Corrected ^{85}Kr (dpm/cc)	Corrected Error (dpm/cc)
1	2020/8/17 8:24	77.35	2.2	1.34	77.35	2.20
2	2020/8/17 9:53	77.62	2.13	1.44	77.80	3.83
3	2020/8/17 11:15	80.19	2.2	1.32	81.96	3.88
4	2020/8/17 12:37	50.31	1.73	0.98	31.68	1.84
5	2020/8/17 13:58	78.4	2.39	1	83.15	4.28
6	2020/8/17 15:20	76.82	2.73	0.37	79.07	4.71
7	2020/8/17 16:44	80.6	2.35	1.2	85.10	4.18
8	2020/8/17 18:06	82.18	2.42	0.96	86.62	4.29
9	2020/8/17 19:28	64.42	2.24	0.43	56.45	3.28
10	2020/8/17 21:04	69.71	2.51	0.43	66.02	3.97
11	2020/8/17 23:18	80.52	2.4	0.94	84.24	4.20
12	2020/8/18 0:39	75.47	2.19	1.12	75.21	3.65
13	2020/8/18 2:04	77.77	2.14	1.34	79.13	3.65
14	2020/8/18 3:26	77.31	2.15	1.01	78.13	3.64
15	2020/8/18 5:00	52.26	1.63	1	36.50	1.90
16	2020/8/18 6:10	76.14	2.23	1.4	78.15	3.82
17	2020/8/18 7:50	78.22	2.18	2.47	81.04	3.78
18	2020/8/18 11:18	62.82	1.96	1.13	54.77	2.86
19	2020/8/18 13:37	76.62	2.32	1.47	78.58	3.97
20	2020/8/18 15:00	78.9	2.31	1.68	82.00	4.01
Weekly averaged ^{85}Kr (dpm/cc)		77.85 \pm 1.98				