

Extraction separation of lithium isotopes by B12C4/B15C5/B18C6- ionic liquid systems

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3.1: The effect of crown ethers in different ionic liquids.

Table S1: The effect of crown ethers in different ionic liquids.

B12C4				
ionic liquids	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
[EMIm][NTf ₂]	23.35	1.023	6.47	-15.72
[BMIm][NTf ₂]	19.6	1.021	6.70	-13.96
[HMIm][NTf ₂]	19.77	1.021	6.94	-13.44
[OMIm][NTf ₂]	18.1	1.022	6.62	-14.91
[DMIm][NTf ₂]	18.2	1.023	6.79	-15.87
B15C5				
ionic liquids	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
[EMIm][NTf ₂]	40.88	1.024	14.81	-8.97
[BMIm][NTf ₂]	37.77	1.025	14.56	-9.99
[HMIm][NTf ₂]	37.37	1.025	14.65	-10.07
[OMIm][NTf ₂]	34.95	1.026	14.69	-10.90
[DMIm][NTf ₂]	35.51	1.027	14.65	-11.60
B18C6				
ionic liquids	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
[EMIm][NTf ₂]	38.12	1.0098	5.95	-3.79
[BMIm][NTf ₂]	34.94	1.0103	6.08	-4.13
[HMIm][NTf ₂]	35.32	1.0097	5.85	-3.84
[OMIm][NTf ₂]	35.91	1.0097	5.85	-3.81
[DMIm][NTf ₂]	35.48	1.0099	6.00	-3.90

3.2: The effect of crown ethers in different solvents.

Table S2: The effect of crown ethers in different solvents.

B12C4				
volume ratio of ionic liquid to anisole	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
0:1	19.97	1.023	13.96	-11.95
2:8	22.14	1.021	6.70	-14.36
3:7	23.35	1.023	6.47	-15.72
4:6	23.02	1.018	6.34	-11.14
5:5	19.97	1.023	13.96	-11.95

B15C5				
volume ratio of ionic liquid to anisole	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
0:1	37.15	1.024	13.78	-13.34
2:8	39.94	1.025	15.12	-9.83
3:7	40.88	1.024	14.81	-8.97
4:6	40.61	1.025	14.99	-9.59
5:5	38.40	1.025	14.99	-9.54

B18C6				
volume ratio of ionic liquid to anisole	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
0:1	34.44	1.0099	5.91	-4.06
2:8	37.79	1.009	5.89	-3.95
3:7	38.12	1.0098	5.95	-3.97
4:6	37.51	1.0099	5.93	-3.93
5:5	36.47	1.0094	5.85	-3.54

3.3: The effect of crown ethers with different concentration.

Table S3: The effect of crown ethers with different concentration.

B12C4				
crown ether concentration	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
0.2	8.52	1.016	3.88	-12.15
0.4	18.12	1.019	5.61	-13.05
0.5	23.35	1.023	6.47	-15.72
0.6	24.78	1.020	7.18	-12.79
0.8	29.23	1.022	9.38	-12.05
1.0	36.54	1.022	10.82	-11.25

B15C5				
crown ether concentration	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
0.2	13.6	1.018	7.46	-10.18
0.4	30.62	1.022	12.46	-9.27
0.5	40.88	1.024	14.81	-8.97
0.6	43.28	1.024	16.99	-6.66
0.8	56.16	1.025	21.07	-3.81

B18C6				
crown ether concentration	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
0.2	11.26	1.0099	3.92	-5.90
0.4	29.40	1.0100	5.58	-4.35
0.5	38.12	1.0098	5.95	-3.79
0.6	40.48	1.0100	6.62	-3.30
0.8	51.86	1.0099	7.72	-2.13
1.0	62.17	1.0099	8.47	-1.98

3.4: The effect of crown ethers with different lithium salts.

Table S4: The effect of crown ethers with different lithium salts.

B12C4				
lithium salts	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
LiNTf ₂	23.35	1.023	6.47	-15.72
LiClO ₄	10.99	1.025	4.56	-20.37
LiI	8.64	1.026	7.53	-17.87
LiBr	2.61	1.026	7.96	-17.65
LiCl	0.98	1.026	8.03	-17.13
B15C5				
lithium salts	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
LiNTf ₂	40.88	1.024	14.81	-8.97
LiClO ₄	34.52	1.025	15.26	-9.59
LiI	30.53	1.025	14.85	-9.61
LiBr	25.85	1.025	14.97	-9.58
LiCl	24.59	1.024	14.80	-9.47
B18C6				
lithium salts	E(%)	α	$\delta^7\text{Li}_{\text{aq}}$	$\delta^7\text{Li}_{\text{org}}$
LiNTf ₂	38.12	1.0098	5.95	-3.79
LiClO ₄	16.82	1.0093	8.4	-4.38
LiI	11.37	1.0091	7.90	-1.18
LiBr	9.73	1.0092	8.33	-0.87
LiCl	6.85	1.0094	8.43	-0.94

3.3: The effect of crown ethers with different concentration.

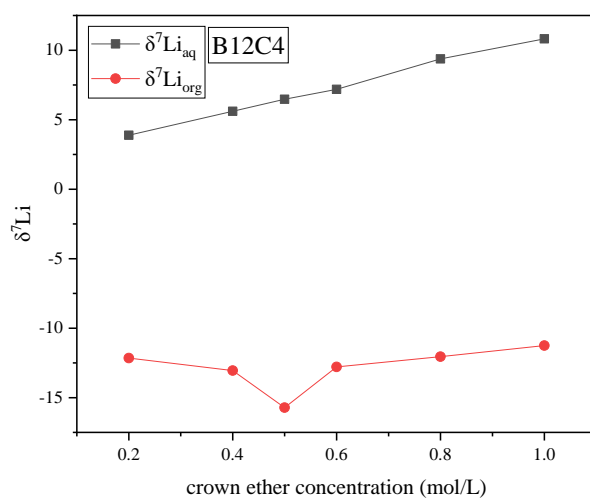


Figure S1: The $\delta^7\text{Li}$ of B12C4 system with different concentration.

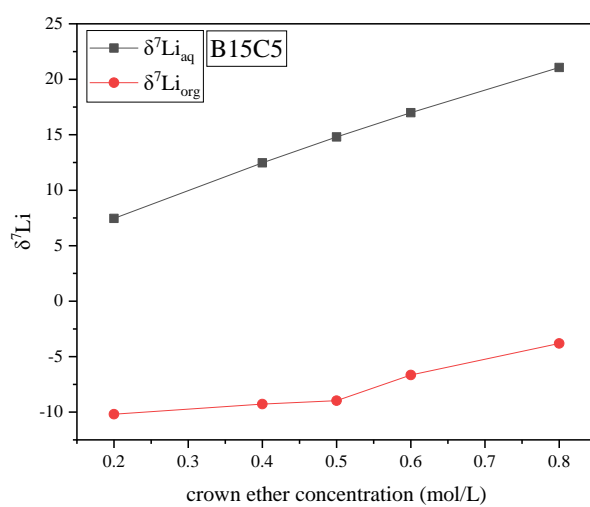


Figure S2: The $\delta^7\text{Li}$ of B15C5 system with different concentration.

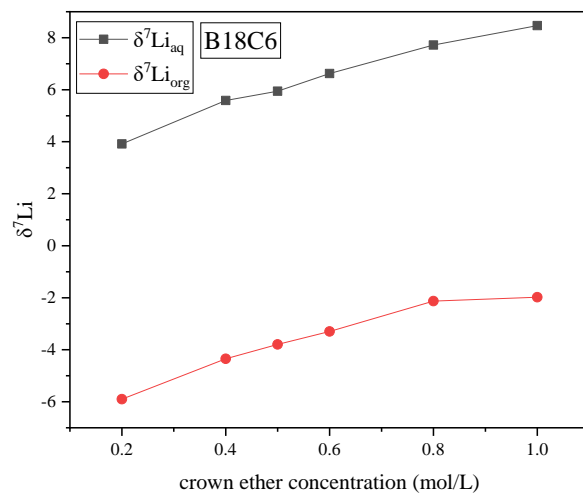


Figure S3: The $\delta^7\text{Li}$ of B18C6 system with different concentration.