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Appendix 1 A pH-metric titration data of 1.00×10^{-3} M L-isoleucine at constant ionic strength of 0.10 M KCl and 37.0 ± 0.5°C with 9.52×10^{-3} M NaOH (a= the number of moles of NaOH added per mole of L-isoleucine, pH^m = pH measured and pH^c= pH calculated)

NaOH added (cm^3)	a	pH^m	pH^c
0.00	0.000	6.35	6.12
0.20	0.038	7.30	9.20
0.40	0.076	7.82	9.50
0.60	0.114	8.28	9.67
0.80	0.152	8.44	9.80
1.00	0.190	8.56	9.89
1.20	0.228	8.65	9.97
1.40	0.266	8.76	10.04
1.60	0.304	8.82	10.09
1.80	0.343	8.90	10.14
2.00	0.381	8.96	10.19
2.20	0.419	9.01	10.23
2.40	0.457	9.06	10.26
2.60	0.495	9.12	10.29
2.80	0.533	9.17	10.33
3.00	0.571	9.22	10.35
3.20	0.609	9.26	10.38
3.40	0.647	9.30	10.04
3.60	0.685	9.34	10.43
3.80	0.723	9.37	10.45
4.00	0.761	9.40	10.47
4.20	0.799	9.43	10.49
4.40	0.838	9.46	10.51
4.60	0.876	9.49	10.53
4.80	0.914	9.52	10.54
5.00	0.952	9.56	10.56
5.20	0.990	9.59	10.57
5.40	1.028	9.62	10.59
5.60	1.066	9.65	10.60
5.80	1.104	9.68	10.62
6.00	1.142	9.70	10.63

Appendix 1 B pH-metric titration data of 1.00×10^{-3}M L-leucine at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.04×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-leucine, pH^m = pH measured and pH^c = pH calculated)

NaOH added (cm^3)	a	pH^m	pH^c
0.00	0.000	5.23	6.13
0.20	0.036	7.43	9.18
0.40	0.072	8.06	9.48
0.60	0.108	8.25	9.65
0.80	0.145	8.44	9.77
1.00	0.181	8.55	9.87
1.20	0.217	8.65	9.95
1.40	0.253	8.75	10.01
1.60	0.289	8.83	10.07
1.80	0.325	8.90	10.12
2.00	0.362	8.97	10.16
2.20	0.398	9.03	10.20
2.40	0.434	9.09	10.24
2.60	0.470	9.14	10.27
2.80	0.506	9.20	10.30
3.00	0.542	9.24	10.33
3.20	0.573	9.29	10.36
3.40	0.615	9.33	10.38
3.60	0.651	9.36	10.40
3.80	0.687	9.40	10.43
4.00	0.723	9.44	10.45
4.20	0.759	9.47	10.47
4.40	0.736	9.51	10.49
4.60	0.832	9.55	10.50
4.80	0.868	9.58	10.52
5.00	0.904	9.61	10.54
5.20	0.940	9.65	10.55
5.40	0.976	9.68	10.57
5.60	1.013	9.71	10.58
5.80	1.048	9.74	10.60
6.00	1.084	9.77	10.61

Appendix 1 C pH-metric titration data of 1.00×10^{-3} M L-lysine at constant ionic strength of 0.10 M KCl and $37.0 \pm 0.5^{o}C$ with 9.52×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-lysine, pH^{m} = pH measured and pH^{c} = pH calculated)

NaOH added (cm^3)	a	pH^{m}	pH^{c}
0.00	0.000	9.27	5.82
0.20	0.038	9.31	9.20
0.40	0.076	9.34	9.50
0.60	0.114	9.39	9.67
0.80	0.152	9.42	9.80
1.00	0.190	9.46	9.89
1.20	0.228	9.51	9.97
1.40	0.266	9.54	10.04
1.60	0.304	9.58	10.09
2.00	0.381	9.65	10.19
2.20	0.419	9.69	10.23
2.40	0.457	9.72	10.26
2.60	0.495	9.76	10.29
2.80	0.533	9.79	10.33
3.00	0.571	9.82	10.35
3.20	0.609	9.84	10.38
3.40	0.647	9.87	10.04
3.60	0.685	9.89	10.43
3.80	0.723	9.92	10.45
4.00	0.761	9.94	10.47
4.20	0.799	9.97	10.49
4.40	0.838	9.99	10.51
4.60	0.876	10.01	10.53
4.80	0.914	10.03	10.54
5.00	0.952	10.05	10.56
5.20	0.990	10.07	10.57
5.40	1.028	10.09	10.59
5.60	1.066	10.11	10.60
5.80	1.104	10.13	10.62
6.00	1.142	10.14	10.63

Appendix 1 D pH-metric titration data of 1.00×10^{-3}M L-methionine at constant ionic strength of 0.10M KCl and 37.0 ± 0.5^{o}C with 9.02×10^{-3}M NaOH (a=the number of moles of NaOH added per mole of L-methionine, pH^{m} = pH measured and pH^{c}= pH calculated)

NaOH added (cm^3)	a	pH^{m}	pH^{c}
0.00	0.000	5.88	5.88
0.20	0.036	7.17	9.18
0.40	0.072	7.62	9.48
0.60	0.108	7.83	9.65
0.80	0.144	7.99	9.77
1.00	0.180	8.09	9.87
1.20	0.216	8.20	9.95
1.40	0.252	8.30	10.01
1.60	0.288	8.37	10.07
1.80	0.325	8.45	10.12
2.00	0.361	8.52	10.16
2.20	0.397	8.58	10.20
2.40	0.433	8.64	10.24
2.60	0.469	8.70	10.27
2.80	0.505	8.75	10.30
3.00	0.541	8.82	10.33
3.20	0.577	8.87	10.36
3.40	0.613	8.92	10.38
3.60	0.649	8.97	10.40
3.80	0.685	9.02	10.43
4.00	0.721	9.06	10.45
4.20	0.757	9.10	10.47
4.40	0.793	9.15	10.48
4.60	0.830	9.20	10.50
4.80	0.866	9.26	10.52
5.00	0.902	9.31	10.54
5.20	0.938	9.36	10.56
5.40	0.974	9.41	10.57
5.60	1.010	9.46	10.58
5.80	1.046	9.50	10.59
6.00	1.082	9.55	10.60

Appendix 1 E pH-metric titration data of 1.00×10^{-3}M L-phenylalanine at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}C$ with 8.94×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-phenylalanine, pH^m = pH measured and pH^c = pH calculated)

NaOH added (cm^3)	a	pH^m	pH^c
0.00	0.000	6.60	5.93
0.20	0.036	7.43	9.17
0.40	0.071	7.73	9.47
0.60	0.107	7.91	9.65
0.80	0.143	8.06	9.77
1.00	0.179	8.17	9.87
1.20	0.214	8.27	9.94
1.40	0.250	8.37	10.01
1.60	0.286	8.43	10.06
1.80	0.322	8.50	10.11
2.00	0.357	8.57	10.16
2.20	0.393	8.62	10.20
2.40	0.429	8.69	10.23
2.60	0.465	8.75	10.27
2.80	0.501	8.81	10.30
3.00	0.536	0.87	10.33
3.20	0.572	8.92	10.35
3.40	0.608	8.99	10.38
3.60	0.644	9.04	10.40
3.80	0.679	9.10	10.42
4.00	0.715	9.15	10.44
4.20	0.751	9.21	10.46
4.40	0.787	9.25	10.48
4.60	0.822	9.31	10.50
4.80	0.858	9.35	10.52
5.00	0.894	9.40	10.53
5.20	0.930	9.45	10.55
5.40	0.965	9.50	10.56
5.60	1.001	9.55	10.58
5.80	1.037	9.60	10.59
6.00	1.073	9.64	10.60

Appendix 1 F pH-metric titration data of 1.00×10^{-3}M L-threonine at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.02×10^{-3}M NaOH (a = thenumber of moles of NaOH added per mole of L-threonine, pH^m = pH measured and pH^c = pH calculated)

NaOH added (cm^3)	a	pH^m	pH^c
0.00	0.000	5.98	5.84
0.20	0.036	6.95	9.18
0.40	0.072	7.47	9.48
0.60	0.108	7.69	9.65
0.80	0.144	7.84	9.77
1.00	0.180	7.98	9.87
1.20	0.216	8.08	9.95
1.40	0.252	8.17	10.01
1.60	0.288	8.24	10.07
1.80	0.325	8.31	10.12
2.00	0.361	8.36	10.16
2.20	0.397	8.42	10.20
2.40	0.433	8.50	10.24
2.60	0.469	8.56	10.27
2.80	0.505	8.63	10.30
3.00	0.541	8.68	10.33
3.20	0.577	8.74	10.36
3.40	0.613	8.79	10.38
3.60	0.649	8.84	10.40
3.80	0.685	8.90	10.43
4.00	0.721	8.94	10.45
4.20	0.757	9.00	10.47
4.40	0.793	9.03	10.48
4.60	0.830	9.08	10.50
4.80	0.866	9.13	10.52
5.00	0.902	9.18	10.54
5.20	0.938	9.24	10.56
5.40	0.974	9.29	10.57
5.60	1.010	9.33	10.58
5.80	1.046	9.39	10.59
6.00	1.082	9.43	10.61

Appendix 1 G pH-metric titration data of 1.00×10^{-3}M L-tryptophan at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.06×10^{-3}M NaOH (a=the number of NaOH added per mole of L-tryptophan, pH^m = pH measured and pH^c = pH calculated)

NaOH added (cm^3)	a	pH^m	pH^c
0.00	0.000	6.42	6.10
0.20	0.036	7.57	9.18
0.40	0.072	8.04	9.48
0.60	0.109	8.26	9.65
0.80	0.145	8.42	9.78
1.00	0.181	8.57	9.87
1.20	0.217	8.67	9.95
1.40	0.254	8.75	10.01
1.60	0.290	8.83	10.07
1.80	0.326	8.90	10.12
2.00	0.362	8.97	10.16
2.20	0.399	9.03	10.20
2.40	0.435	9.10	10.24
2.60	0.471	9.16	10.27
2.80	0.508	9.20	10.30
3.00	0.544	9.25	10.33
3.20	0.580	9.30	10.36
3.40	0.616	9.35	10.38
3.60	0.653	9.40	10.41
3.80	0.689	9.44	10.43
4.00	0.725	9.50	10.45
4.20	0.761	9.54	10.47
4.40	0.798	9.58	10.49
4.60	0.834	9.62	10.50
4.80	0.870	9.66	10.52
5.00	0.906	9.71	10.54
5.20	0.943	9.75	10.55
5.40	0.979	9.79	10.57
5.60	1.015	9.84	10.58
5.80	1.051	9.88	10.60
6.00	1.088	9.91	10.61

Appendix 1 H pH-metric titration data of 1.00×10^{-3}M L-valine at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.52×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-valine, pH^m = pH measured and pH^c = pH calculated)

NaOH added (cm^3)	a	pH^m	pH^c
0.00	0.000	6.55	6.07
0.20	0.038	7.45	9.20
0.40	0.076	7.97	9.50
0.60	0.114	8.23	9.67
0.80	0.152	8.37	9.80
1.00	0.190	8.50	9.89
1.20	0.228	8.58	9.97
1.40	0.266	8.67	10.04
1.60	0.304	8.75	10.09
1.80	0.343	8.82	10.14
2.00	0.381	8.90	10.19
2.20	0.419	8.97	10.23
2.40	0.457	9.00	10.26
2.60	0.495	9.05	10.29
2.80	0.533	9.10	10.33
3.00	0.571	9.16	10.35
3.20	0.609	9.22	10.38
3.40	0.647	9.27	10.40
3.60	0.685	9.28	10.43
3.80	0.723	9.32	10.45
4.00	0.761	9.37	10.47
4.20	0.799	9.42	10.49
4.40	0.838	9.47	10.51
4.60	0.876	9.52	10.53
4.80	0.914	9.56	10.54
5.00	0.952	9.61	10.56
5.20	0.990	9.65	10.57
5.40	1.028	9.69	10.59
5.60	1.066	9.73	10.60
5.80	1.104	9.77	10.62
6.00	1.142	9.81	10.63

Appendix 2 A pH-metric titration data of 1.00×10^{-3}M L-isoleucine and 5.00×10^{-4}M Cd(II) ion at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.52×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-isoleucine)

NaOH added (cm^3)	a	pH
0.00	0.000	4.09
0.20	0.038	4.15
0.40	0.076	4.22
0.60	0.114	4.31
0.80	0.152	4.38
1.00	0.190	4.47
1.20	0.228	4.57
1.40	0.266	4.66
1.60	0.304	4.77
1.80	0.343	4.88
2.00	0.381	4.99
2.20	0.419	5.12
2.40	0.457	5.22
2.60	0.495	5.35
2.80	0.533	5.49
3.00	0.571	5.62
3.20	0.609	5.76
3.40	0.647	5.92
3.60	0.685	6.04
3.80	0.723	6.19
4.00	0.761	6.40
4.20	0.799	6.54
4.40	0.838	6.76
4.60	0.876	7.00
4.80	0.914	7.22
5.00	0.952	7.56
5.20	0.990	7.94
5.40	1.028	8.27
5.60	1.066	8.57
5.80	1.104	8.75
6.00	1.142	8.94

Appendix 2 B pH-metric titration data of 1.00×10^{-3}M L-leucine and 5.00×10^{-4}M Cd(II) ion at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.04×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-leucine)

NaOH added (cm^3)	a	pH
0.00	0.000	4.03
0.20	0.036	4.07
0.40	0.072	4.14
0.60	0.108	4.22
0.80	0.145	4.30
1.00	0.181	4.37
1.20	0.217	4.46
1.40	0.253	4.55
1.60	0.289	4.65
1.80	0.325	4.73
2.00	0.362	4.85
2.20	0.398	4.94
2.40	0.434	5.07
2.60	0.470	5.21
2.80	0.506	5.33
3.00	0.542	5.45
3.20	0.579	5.59
3.40	0.615	5.72
3.60	0.651	5.86
3.80	0.678	6.00
4.00	0.723	6.14
4.20	0.759	6.30
4.40	0.796	6.47
4.60	0.832	6.66
4.80	0.868	6.85
5.00	0.904	7.13
5.20	0.940	7.42
5.40	0.976	7.80
5.60	1.013	8.21
5.80	1.048	8.60
6.00	1.084	8.85

Appendix 2 C pH-metric titration data of 1.00×10^{-3} M L-lysine and 5.00×10^{-4} M Cd(II) ion at constant ionic strength of 0.10 M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.52×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-lysine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	7.27	
0.20	0.038	7.55	
0.40	0.076	7.84	
0.60	0.114	8.15	precipitation

Appendix 2 D pH-metric titration data of 1.00×10^{-3} M L-methionine and 5.00×10^{-4} M Cd(II) ion at constant ionic strength of 0.10 M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.02×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-methionine)

NaOH added (cm^3)	a	pH
0.00	0.000	3.89
0.20	0.036	3.94
0.40	0.072	4.00
0.60	0.108	4.06
0.80	0.144	4.14
1.00	0.180	4.19
1.20	0.216	4.27
1.40	0.252	4.37
1.60	0.288	4.45
1.80	0.325	4.54
2.00	0.361	4.64
2.20	0.397	4.73
2.40	0.433	4.85
2.60	0.469	4.96
2.80	0.505	5.08
3.00	0.541	5.19
3.20	0.577	5.32
3.40	0.613	5.43
3.60	0.649	5.57
3.80	0.685	5.70
4.00	0.721	5.84
4.20	0.757	6.02
4.40	0.793	6.17
4.60	0.830	6.36
4.80	0.866	6.53
5.00	0.902	6.74
5.20	0.938	7.06
5.40	0.974	7.39
5.60	1.010	7.75
5.80	1.046	8.30
6.00	1.082	8.67

Appendix 2 E pH-metric titration data of 1.00×10^{-3}M L-phenylalanine and 5.00×10^{-4}M Cd(II) ion at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 8.94×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-phenylalanine)

NaOH added (cm^3)	a	pH
0.00	0.000	3.86
0.20	0.036	3.92
0.40	0.071	3.98
0.60	0.107	4.05
0.80	0.143	4.12
1.00	0.179	4.19
1.20	0.214	4.27
1.40	0.250	4.35
1.60	0.286	4.44
1.80	0.322	4.53
2.00	0.357	4.61
2.20	0.393	4.71
2.40	0.429	4.81
2.60	0.465	4.91
2.80	0.501	5.01
3.00	0.536	5.12
3.20	0.572	5.24
3.40	0.608	5.34
3.06	0.644	5.48
3.80	0.679	5.61
4.00	0.715	5.76
4.20	0.751	5.93
4.40	0.787	6.10
4.60	0.822	6.29
4.80	0.858	6.53
5.00	0.894	6.75
5.20	0.930	7.11
5.40	0.965	7.42
5.60	1.001	7.83
5.80	1.037	8.27
6.00	1.073	8.58

Appendix 2 F pH-metric titration data of 1.00×10^{-3} M L-threonine and 5.00×10^{-4} M Cd(II) ion at constant ionic strength of 0.10 M KCl and $37.0 \pm 0.5^{\circ}$C with 9.02×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-threonine)

NaOH added (cm^3)	a	pH
0.00	0.000	3.80
0.20	0.036	3.84
0.40	0.072	3.90
0.60	0.108	3.95
0.80	0.144	4.01
1.00	0.180	4.08
1.20	0.216	4.15
1.40	0.252	4.22
1.60	0.288	4.30
1.80	0.325	4.38
2.00	0.361	4.48
2.20	0.397	4.56
2.40	0.433	4.69
2.60	0.469	4.80
2.80	0.505	4.91
3.00	0.541	5.04
3.20	0.577	5.15
3.40	0.613	5.29
3.60	0.649	5.42
3.80	0.685	5.54
4.00	0.721	5.67
4.20	0.757	5.83
4.40	0.793	6.02
4.60	0.830	6.17
4.80	0.866	6.39
5.00	0.902	6.61
5.20	0.938	6.95
5.40	0.974	7.27
5.60	1.010	7.68
5.80	1.046	8.10
6.00	1.082	8.35

Appendix 2 G pH-metric titration data of 1.00×10^{-3}M L-tryptophan and 5.00×10^{-4}M Cd(II) ion at constant ionic strength of 0.10M KCl and 37.0 $\pm$ 0.5°C with 9.06×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-tryptophan)

NaOH added (cm^3)	a	pH
0.00	0.000	4.01
0.20	0.036	4.05
0.40	0.072	4.12
0.60	0.109	4.17
0.80	0.145	4.23
1.00	0.181	4.29
1.20	0.217	4.35
1.40	0.254	4.43
1.60	0.290	4.50
1.80	0.326	4.57
2.00	0.362	4.64
2.20	0.399	4.73
2.40	0.435	4.81
2.60	0.471	4.89
2.80	0.508	4.98
3.00	0.544	5.08
3.20	0.580	5.18
3.40	0.616	5.27
3.60	0.653	5.39
3.80	0.689	5.50
4.00	0.725	5.64
4.20	0.761	5.77
4.40	0.798	5.93
4.60	0.834	6.10
4.80	0.870	6.31
5.00	0.906	6.60
5.20	0.943	6.97
5.40	0.979	7.55
5.60	1.015	8.06
5.80	1.051	8.58
6.00	1.088	9.00

Appendix 2 H pH-metric titration data of 1.00×10^{-3}M L-valine and 5.00×10^{-4}M Cd(II) ion at constant ionic strength of 0.10M KCl and 37.0 ± 0.5^{o}C with 9.52×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-valine)

NaOH added (cm^3)	a	pH
0.00	0.000	4.06
0.20	0.038	4.13
0.40	0.076	4.19
0.60	0.114	4.26
0.80	0.152	4.36
1.00	0.190	4.44
1.20	0.228	4.52
1.40	0.266	4.63
1.60	0.304	4.72
1.80	0.343	4.81
2.00	0.381	4.93
2.20	0.419	5.03
2.40	0.457	5.16
2.60	0.495	5.29
2.80	0.533	5.41
3.00	0.571	5.56
3.20	0.609	5.69
3.40	0.647	5.81
3.60	0.685	5.95
3.80	0.723	6.10
4.00	0.761	6.24
4.20	0.799	6.43
4.40	0.838	6.57
4.60	0.876	6.78
4.80	0.914	7.00
5.00	0.952	7.25
5.20	0.990	7.70
5.40	1.028	8.14
5.60	1.066	8.55
5.80	1.104	8.86
6.00	1.142	9.11

Appendix 3 A pH-metric titration data of 1.00×10^{-3} M L-isoleucine and 5.00×10^{-4} M Mn(II) ion at the constant ionic strength of 0.10M KCl and 37.0 $\pm$ 0.5°C with 9.52×10^{-3} M NaOH (a = the number of moles of base added per mole of L-isoleucine)

NaOH added (cm^3)	a	pH
0.00	0.000	6.48
0.20	0.038	7.54
0.40	0.076	8.14
0.60	0.114	8.32
0.80	0.152	8.46
1.00	0.190	8.59
1.20	0.228	8.68
1.40	0.266	8.76
1.60	0.304	8.83
1.80	0.343	8.91
2.00	0.381	8.96
2.20	0.419	9.03
2.40	0.457	9.08
2.60	0.495	9.13
2.80	0.533	9.18
3.00	0.571	9.22
3.20	0.609	9.26
3.40	0.647	9.28
3.60	0.685	9.30
3.80	0.723	9.31
4.00	0.761	9.34
4.20	0.799	9.36
4.40	0.838	9.38
4.60	0.876	9.40
4.80	0.914	9.42
5.00	0.952	9.44
5.20	0.990	9.46
5.40	1.028	9.48
5.60	1.066	9.49
5.80	1.104	9.51
6.00	1.142	9.53

Appendix 3 B pH-metric titration data of 1.00×10^{-3} M L-leucine and 5.00×10^{-4} M Mn(II) ion at the constant ionic strength of 0.10 M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.04×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-leucine)

NaOH added (cm^3)	a	pH
0.00	0.000	5.52
0.20	0.036	7.26
0.40	0.072	7.80
0.60	0.108	8.13
0.80	0.145	8.31
1.00	0.181	8.44
1.20	0.217	8.55
1.40	0.253	8.64
1.60	0.289	8.73
1.80	0.325	8.80
2.00	0.362	8.86
2.20	0.398	8.92
2.40	0.434	8.98
2.60	0.470	9.02
2.80	0.506	9.07
3.00	0.542	9.12
3.20	0.579	9.16
3.40	0.615	9.20
3.60	0.651	9.23
3.80	0.687	9.26
4.00	0.723	9.30
4.20	0.759	9.33
4.40	0.796	9.35
4.60	0.832	9.37
4.80	0.868	9.39
5.00	0.904	9.41
6.00	1.085	9.49

Appendix 3 C pH-metric titration data of 1.00×10^{-3}M L-lysine and 5.00×10^{-4}M Mn(II) ion at the constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.52×10^{-3}M NaOH (a = the number of moles of base added per mole of L-lysine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	8.37	
0.20	0.038	8.42	
0.40	0.076	8.47	
0.60	0.114	8.52	precipitation

Appendix 3 D pH-metric titration data of 1.00×10^{-3}M L-methionine and 5.00×10^{-4}M Mn(II) ion at the constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.02×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-methionine)

NaOH added (cm^3)	a	pH
0.00	0.000	6.15
0.20	0.036	6.90
0.40	0.72	7.52
0.60	0.108	7.77
0.80	0.144	7.92
1.00	0.180	8.03
1.20	0.216	8.13
1.40	0.252	8.20
1.60	0.288	8.28
1.80	0.325	8.34
2.00	0.361	8.41
2.20	0.397	8.48
2.40	0.433	8.54
2.60	0.469	8.59
2.80	0.505	8.65
3.00	0.541	8.70
3.20	0.577	8.76
3.40	0.613	8.81
3.60	0.649	8.85
3.80	0.685	8.89
4.00	0.721	8.94
4.20	0.757	8.98
4.40	0.793	9.02
4.60	0.830	9.05
4.80	0.866	9.08
5.00	0.902	9.12
5.50	0.990	9.20
6.00	1.082	9.28

Appendix 3 E pH-metric titration data of 1.00×10^{-3} M L-phenylalanine and 5.00×10^{-4} M Mn (II) ion at the constant ionic strength of 0.10 M KCl and $37.0 \pm 0.5^{\circ}C$ with 8.94×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-phenylalanine)

NaOH added (cm^3)	a	pH
0.00	0.000	5.77
0.20	0.071	7.10
0.40	0.071	7.50
0.60	0.107	7.70
0.80	0.143	7.87
1.00	0.179	8.00
1.20	0.214	8.12
1.40	0.250	8.20
1.60	0.286	8.29
1.80	0.322	8.37
2.00	0.357	8.43
2.20	0.393	8.50
2.40	0.429	8.56
2.60	0.465	8.62
2.80	0.501	8.68
3.00	0.536	8.73
3.20	0.572	8.78
3.40	0.608	8.83
3.60	0.644	8.87
3.80	0.679	8.93
4.00	0.715	8.97
4.20	0.751	9.02
4.40	0.787	9.04
4.60	0.822	9.08
4.80	0.858	9.13
5.00	0.894	9.19
5.50	0.983	9.28
6.00	1.073	9.38

Appendix 3 F pH-metric titration data of 1.00×10^{-3}M L-threonine and 5.00×10^{-4}M Mn(II) ion at the constant ionic strength of 0.10M KCl and 37.0 $\pm$ 0.5°C with 9.02×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-threonine)

NaOH added (cm^3)	a	pH
0.00	0.000	6.32
0.20	0.036	7.03
0.40	0.072	7.39
0.60	0.108	7.61
0.80	0.144	7.76
1.00	0.180	7.89
1.20	0.216	8.00
1.40	0.252	8.08
1.60	0.288	8.15
1.80	0.325	8.24
2.00	0.361	8.30
2.20	0.397	8.36
2.40	0.433	8.43
2.60	0.469	8.48
2.80	0.505	8.54
3.00	0.541	8.58
3.20	0.577	8.64
3.40	0.613	8.69
3.60	0.649	8.75
3.80	0.685	8.78
4.00	0.721	8.82
4.20	0.757	8.87
4.40	0.793	8.91
4.60	0.830	8.96
4.80	0.866	9.00
5.00	0.902	9.05
5.20	0.938	9.10
5.40	0.974	9.14
5.60	1.010	9.18
5.80	1.046	9.22
6.00	1.082	9.25

Appendix 3 G pH-metric titration data of 1.00×10^{-3} M L-tryptophan and 5.00×10^{-4} M Mn(II) ion at the constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}C$ with 9.06×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-tryptophan)

NaOH added (cm^3)	a	pH
0.00	0.000	6.07
0.20	0.036	7.42
0.40	0.072	7.85
0.60	0.109	8.06
0.80	0.145	8.27
1.00	0.181	8.39
1.20	0.217	8.49
1.40	0.254	8.57
1.60	0.290	8.66
1.80	0.326	8.72
2.00	0.362	8.80
2.20	0.399	8.86
2.40	0.435	8.92
2.60	0.471	8.97
2.80	0.508	9.02
3.00	0.544	9.07
3.20	0.580	9.12
3.40	0.616	9.16
3.60	0.653	9.21
3.80	0.689	9.25
4.00	0.725	9.29
4.20	0.761	9.33
4.40	0.798	9.36
4.60	0.834	9.40
4.80	0.870	9.44
5.00	0.906	9.47
5.50	0.998	9.55

Appendix 3 H pH-metric titration data of 1.00×10^{-3}M L-valine and 5.00×10^{-4}M Mn(II) ion at the constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.52×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-valine)

NaOH added (cm^3)	a	pH
0.00	0.000	6.72
0.20	0.038	7.57
0.40	0.076	7.96
0.60	0.114	8.16
0.80	0.152	8.33
1.00	0.190	8.45
1.20	0.228	8.54
1.40	0.266	8.62
1.60	0.304	8.69
1.80	0.343	8.77
2.00	0.381	8.82
2.20	0.419	8.88
2.40	0.457	8.95
2.60	0.495	8.99
2.80	0.533	9.05
3.00	0.571	9.09
3.20	0.609	9.14
3.40	0.647	9.18
3.60	0.685	9.23
3.80	0.723	9.25
4.00	0.761	9.27
4.20	0.799	9.28
4.40	0.838	9.29
4.60	0.876	9.31
4.80	0.914	9.33
5.00	0.952	9.35
5.20	0.990	9.36
5.40	1.028	9.38
5.60	1.066	9.40
5.80	1.104	9.42
6.00	1.142	9.45

Appendix 4 A pH-metric titration data of 1.00×10^{-3}M L-isoleucine and 5.00×10^{-4}M Pb(II) ion at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 9.52×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-isoleucine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	5.85	
0.20	0.038	6.15	
0.40	0.076	6.50	
0.60	0.114	6.75	
0.80	0.152	6.88	
1.00	0.190	6.96	
1.20	0.228	6.98	precipitation

Appendix 4 B pH-metric titration data of 1.00×10^{-3}M L-leucine and 5.00×10^{-4}M Pb(II) ion at constant ionic strength of 0.10M KCl and 37.0 $\pm$ 0.5°C with 9.04×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-leucine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	5.45	
0.20	0.036	6.29	
0.40	0.072	6.65	
0.60	0.108	6.84	
0.80	0.145	6.97	precipitation

Appendix 4 C pH-metric titration data of 1.00×10^{-3}M L-lysine and 5.00×10^{-4}M Pb (II) ion at constant ionic strength of 0.10M KCl and 37.0 $\pm$ 0.5°C with 9.52×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-lysine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	8.40	
0.20	0.038	8.49	precipitation

Appendix 4 D pH-metric tit ation data of 1.00×10^{-3} M L-methionine and 5.00×10^{-4} M Pb(II) ion at constant ionic strength of 0.10 M KCl and 37.0 ± 0.5^{o}C with 9.02×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-methionine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	5.47	
0.20	0.036	5.95	
0.40	0.072	6.51	
0.60	0.108	6.69	
0.80	0.144	6.81	
1.00	0.180	6.86	
1.20	0.216	6.91	
1.40	0.252	6.94	
1.60	0.288	6.97	precipitation

Appendix 4 E pH-metric titration data of 1.00×10^{-3}M L-phenylalanine and 5.00×10^{-4}M Pb(II) ion at constant ionic strength of 0.10M KCl and $37.0 \pm 0.5^{\circ}$C with 8.94×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-phenylalanine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	5.43	
0.20	0.036	6.17	
0.40	0.071	6.54	
0.60	0.107	6.79	
0.80	0.143	6.92	
1.00	0.179	6.98	precipitation

Appendix 4 F pH-metric titration data of 1.00×10^{-3}M L-threonine and 5.00×10^{-4}M Pb(II) ion at constant ionic strength of 0.10M KCl and 37.0 $\pm$ 0.5°C with 9.02×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-threonine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	6.70	
0.20	0.036	6.14	
0.40	0.072	6.51	
0.60	0.108	6.69	
0.80	0.144	6.83	
1.00	0.180	6.94	
1.20	0.216	7.03	precipitation

Appendix 4 G pH-metric titration data of 1.00×10^{-3}M L-tryptophan and 5.00×10^{-4}M Pb(II) ion at constant ionic strength of 0.10M KCl and 37.0 ± 0.5^{o}C with 9.06×10^{-3}M NaOH (a = the number of moles of NaOH added per mole of L-tryptophan)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	5.71	
0.20	0.036	6.36	
0.40	0.072	6.62	
0.60	0.109	6.87	
0.80	0.145	7.02	precipitation

Appendix 4 H pH-metric titration data of 1.00×10^{-3} M L-valine and 5.00×10^{-4} M Pb(II) ion at constant ionic strength of 0.10, KCl and $37.0 \pm 0.5^{\circ}$C with 9.52×10^{-3} M NaOH (a = the number of moles of NaOH added per mole of L-valine)

NaOH added (cm^3)	a	pH	Remarks
0.00	0.000	5.77	
0.20	0.038	6.30	
0.40	0.076	6.52	
0.60	0.114	6.72	
0.80	0.152	6.83	
1.00	0.190	6.88	
1.20	0.228	6.92	
1.40	0.266	6.99	precipitation

VITA

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