

Supplementary Table S1. Results of open-cell titration for CRM batch #99 using electrode No. 1\*

	Sample#1-1:101.75 g titrant temp:28.9 °C calculated density: 997.77 kg/m <sup>3</sup>			Sample#1-2:101.70 g Titrant temp:28.7 °C calculated density: 997.83 kg/m <sup>3</sup>			Sample#1-3:101.75 g Titrant temp:28.6 °C calculated density: 997.86 kg/m <sup>3</sup>		
	HCl (cm3)	EMF (mV)	Temp. (°C)	HCl (cm3)	EMF (mV)	Temp. (°C)	HCl (cm3)	EMF (mV)	Temp. (°C)
0	0.000	-84.81	27.37	0.000	-85.37	27.39	0.000	-85.45	27.48
1	2.648	167.86	27.30	2.648	168.43	27.43	2.648	168.09	27.48
2	2.688	171.82	27.29	2.688	172.17	27.43	2.688	171.86	27.49
3	2.728	175.05	27.29	2.728	175.36	27.43	2.728	175.06	27.49
4	2.768	177.96	27.29	2.768	178.26	27.44	2.768	177.97	27.49
5	2.808	180.57	27.28	2.808	180.83	27.44	2.808	180.58	27.49
6	2.848	182.95	27.29	2.848	183.19	27.44	2.848	182.95	27.49
7	2.888	185.10	27.29	2.888	185.35	27.45	2.888	185.12	27.48
8	2.928	187.09	27.29	2.928	187.34	27.45	2.928	187.11	27.48
9	2.968	188.96	27.28	2.968	189.19	27.46	2.968	188.98	27.48
10	3.008	190.69	27.27	3.008	190.91	27.46	3.008	190.71	27.48
11	3.048	192.31	27.28	3.048	192.52	27.46	3.048	192.33	27.48
12	3.088	193.84	27.28	3.088	194.05	27.46	3.088	193.86	27.49
13	3.128	195.29	27.27	3.128	195.50	27.46	3.128	195.31	27.49
14	3.168	196.65	27.26	3.168	196.86	27.47	3.168	196.73	27.49
15	3.208	197.96	27.26	3.208	198.16	27.47	3.208	197.99	27.48
16	3.248	199.19	27.27	3.248	199.40	27.47	3.248	199.23	27.48
17	3.288	200.38	27.26	3.288	200.58	27.47	3.288	200.41	27.48
18	3.328	201.50	27.27	3.328	201.70	27.48	3.328	201.53	27.48
19	3.368	202.58	27.27	3.368	202.78	27.48	3.368	202.61	27.48
20	3.408	203.61	27.28	3.408	203.82	27.48	3.408	203.64	27.47
21	3.448	204.62	27.28	3.448	204.81	27.49	3.448	204.64	27.46
22	3.488	205.58	27.28	3.488	205.76	27.49	3.488	205.60	27.46
23	3.528	206.50	27.28	3.528	206.70	27.49	3.528	206.54	27.46
24	3.568	207.40	27.28	3.568	207.59	27.50	3.568	207.45	27.46

\* $k_s = 0.997$ ,  $E^\circ = 383.75$  mV, concentration of titrant = 0.1002 mol/L

Supplementary Table S2. Results of open-cell titration for CRM batch #99 using electrode No. 9\*

Sample#9-1:102.2g titrant temp:26.0 °C calculated density: 998.59 kg/m <sup>3</sup>			Sample#9-2:102.33 g Titrant temp:26.8 °C calculated density: 998.37 kg/m <sup>3</sup>			Sample#9-3:72.18 g Titrant temp:26.6 °C calculated density: 998.42 kg/m <sup>3</sup>			
HCl (cm <sup>3</sup> )	EMF (mV)	Temp. (°C)	HCl (cm <sup>3</sup> )	EMF (mV)	Temp. (°C)	HCl (cm <sup>3</sup> )	EMF (mV)	Temp. (°C)	
0	0.000	-86.26	24.93	0.000	-86.29	24.90	0.000	-85.57	26.26
1	2.698	172.05	25.12	2.698	171.71	24.99	1.999	182.79	26.17
2	2.738	175.32	25.12	2.738	174.94	25.00	2.029	185.36	26.17
3	2.778	178.11	25.13	2.778	177.81	25.01	2.059	187.58	26.18
4	2.818	180.69	25.13	2.818	180.37	25.01	2.089	189.59	26.18
5	2.858	182.98	25.14	2.858	182.78	25.01	2.119	191.49	26.18
6	2.898	185.09	25.15	2.898	184.87	25.02	2.148	193.22	26.18
7	2.938	187.03	25.15	2.938	186.82	25.02	2.178	194.87	26.19
8	2.978	188.88	25.16	2.978	188.67	25.03	2.208	196.41	26.20
9	3.018	190.58	25.16	3.018	190.36	25.03	2.238	197.82	26.20
10	3.058	192.19	25.16	3.058	191.96	25.03	2.268	199.22	26.21
11	3.098	193.67	25.17	3.098	193.49	25.04	2.298	200.50	26.21
12	3.138	195.08	25.17	3.138	194.92	25.04	2.328	201.73	26.21
13	3.178	196.43	25.18	3.178	196.26	25.05	2.358	202.92	26.21
14	3.218	197.76	25.18	3.218	197.55	25.05	2.388	204.05	26.22
15	3.258	198.98	25.19	3.258	198.77	25.05	2.418	205.15	26.21
16	3.298	200.10	25.20	3.298	199.94	25.06	2.448	206.18	26.21
17	3.338	201.24	25.20	3.338	201.05	25.06	2.478	207.16	26.21
18	3.378	202.29	25.21	3.378	202.1	25.07	2.508	208.14	26.22
19	3.418	203.33	25.21	3.418	203.14	25.08	2.538	209.06	26.21
20	3.458	204.30	25.21	3.458	204.16	25.08	2.568	210.08	26.22
21	3.498	205.25	25.21	3.498	205.11	25.08	2.598	210.19	26.22
22	3.538	206.16	25.22	3.538	206.01	25.09	2.628	211.31	26.23
23	3.577	207.04	25.23	3.577	206.91	25.09	2.658	212.68	26.24
24	3.617	207.90	25.23	3.617	207.75	25.10	2.688	214.00	26.24

\* $k_s = 0.989$ ,  $E^\circ = 377.27$  mV, concentration of titrant = 0.1002 mol/L

Supplementary Table S3. Results of open-cell titration for CRM batch #99 using electrode No. 1\* without air bubbling.

Sample#1-4:102.87g titrant temp:26.4 °C calculated density: 998.48 kg/m <sup>3</sup>			Sample#1-5:100.38 g Titrant temp:26.8 °C calculated density: 998.37 kg/m <sup>3</sup>			
HCl (cm <sup>3</sup> )	EMF (mV)	Temp. (°C)	HCl (cm <sup>3</sup> )	EMF (mV)	Temp. (°C)	
0	0.000	-86.00	24.34	0.000	-86.02	24.76
1	2.698	171.41	24.82	2.548	162.95	24.95
2	2.738	174.59	24.82	2.588	167.27	24.95
3	2.778	177.45	24.83	2.628	171.01	24.95
4	2.818	180.00	24.84	2.668	174.30	24.96
5	2.858	182.34	24.85	2.708	177.23	24.97
6	2.898	184.47	24.86	2.748	179.85	24.97
7	2.938	186.48	24.87	2.788	182.24	24.98
8	2.978	188.32	24.88	2.828	184.46	24.98
9	3.018	190.05	24.89	2.868	186.48	24.99
10	3.058	191.66	24.90	2.908	188.35	24.99
11	3.098	193.18	24.91	2.948	190.09	24.99
12	3.138	194.62	24.92	2.988	191.74	24.99
13	3.178	195.97	24.93	3.028	193.26	24.98
14	3.218	197.29	24.95	3.068	194.76	25.00
15	3.258	198.53	24.96	3.108	196.14	25.00
16	3.298	199.70	24.97	3.148	197.45	25.00
17	3.338	200.82	24.98	3.188	198.69	25.01
18	3.378	201.89	24.99	3.228	199.90	25.01
19	3.418	202.92	25.00	3.268	201.02	25.02
20	3.458	203.92	25.01	3.308	202.13	25.03
21	3.498	204.99	25.02	3.348	203.15	25.03
22	3.538	205.80	25.03	3.388	204.15	25.03
23	3.577	206.68	25.04	3.428	205.15	25.04
24	3.617	207.60	25.04	3.468	206.06	25.04

\* $k_s = 0.997$ ,  $E^\circ = 383.75$  mV, concentration of titrant = 0.1002 mol/L