

Method:	Iodine	Iodine Titer with EQP	8/15/2012 1:52:42 PM
Start time:	8/15/2012 2:24:16 PM		

Sample data

No.	Comment / ID	Start time	Sample size	Corr. f	Density
1/6	As2O3	8/15/2012 2:24:16 PM	0.02506 g	1.0	0 g/mL
2/6	As2O3	8/15/2012 2:33:40 PM	0.02442 g	1.0	0 g/mL
3/6	As2O3	8/15/2012 2:43:44 PM	0.02845 g	1.0	0 g/mL
4/6	As2O3	8/15/2012 2:54:59 PM	0.02961 g	1.0	0 g/mL
5/6	As2O3	8/15/2012 3:07:24 PM	0.02209 g	1.0	0 g/mL
6/6	As2O3	8/15/2012 3:17:38 PM	0.02296 g	1.0	0 g/mL

Results

No.	Comment / ID	Start time	Sample size and results			
1/6	As2O3	8/15/2012 2:24:16 PM	0.02506	g		
			R1 = 0.99371	--		Titer
2/6	As2O3	8/15/2012 2:33:40 PM	0.02442	g		
			R1 = 0.99384	--		Titer
3/6	As2O3	8/15/2012 2:43:44 PM	0.02845	g		
			R1 = 0.99310	--		Titer
4/6	As2O3	8/15/2012 2:54:59 PM	0.02961	g		
			R1 = 0.99387	--		Titer
5/6	As2O3	8/15/2012 3:07:24 PM	0.02209	g		
			R1 = 0.99327	--		Titer
6/6	As2O3	8/15/2012 3:17:38 PM	0.02296	g		
			R1 = 0.99360	--		Titer
-/-			R2 = 0.994	--		Mean Titer

Titer

Titer 0.99356

Statistics

Rx	Name	n	Mean value	Unit	s	srel [%]
R1	Titer	6	0.99356	--	0.00031	0.032
R2	Mean Titer	1	0.994	--	NaN	NaN

Raw data**Sample**

No. 1/6
Standard As2O3
Type of standard solid
Comment
Titration stand Rondo60/1A
Weight m = 0.02506 g
Correction factor f = 1.0
Purity p = 100.00 %
Temperature T = 25.0 oC
Sample start 8/15/2012 2:24:16 PM
Sample end 8/15/2012 2:33:40 PM

Method: Iodine Iodine Titer with EQP 8/15/2012 1:52:42 PM
Start time: 8/15/2012 2:24:16 PM

EP titration [1]

Titrant HCl c = 2.0 mol/L TITER = 1.000
 Sensor DG111-SC
 Start potential EST = 13.155 pH
 Consumption EP VEQ1 = 3.695627 mL
 Q1 = 7.391254 mmol
 EEQ1 = 6.500 pH
 Excess VEX = 0.008871 mL
 QEX = 0.017742 mmol
 End VEND = 3.704498 mL
 QEND = 7.408997 mmol
 Termination at EP
 Time t = 0:46 min

EQP titration [2]

Titrant 1/2 I2 c = 0.1 mol/L TITER = 1.00171
 Sensor DM140-SC
 Start potential EST = 102.1 mV
 Predispense EPD = 101.6 mV
 VPD = 0.0000 mL
 nEQ = 1
 No. of EQPs and cand. EQP1
 Consumption VEQ1 = 5.098780 mL
 Q1 = 0.510750 mmol
 EEQ1 = 245.0 mV
 EHN1 = 96.4 mV
 Excess VEX = 0.901220 mL
 QEX = 0.090276 mmol
 End VEND = 6.0000 mL
 QEND = 0.601026 mmol
 Termination at EQPs
 Time t = 5:28 min

Calculation

Result R1 = 0.99371 -- Titer
 Formula $R1 = m / (VEQ[2] * c[2] * C)$
 Constant $M / (10 * p * z)$
 C = 0.04946
 Molar mass $M[As_2O_3] = 197.84 \text{ g/mol}$
 Equivalent number $z[As_2O_3] = 4$
 Duration tUSE = 08:51 min

Measured values EP titration [1]

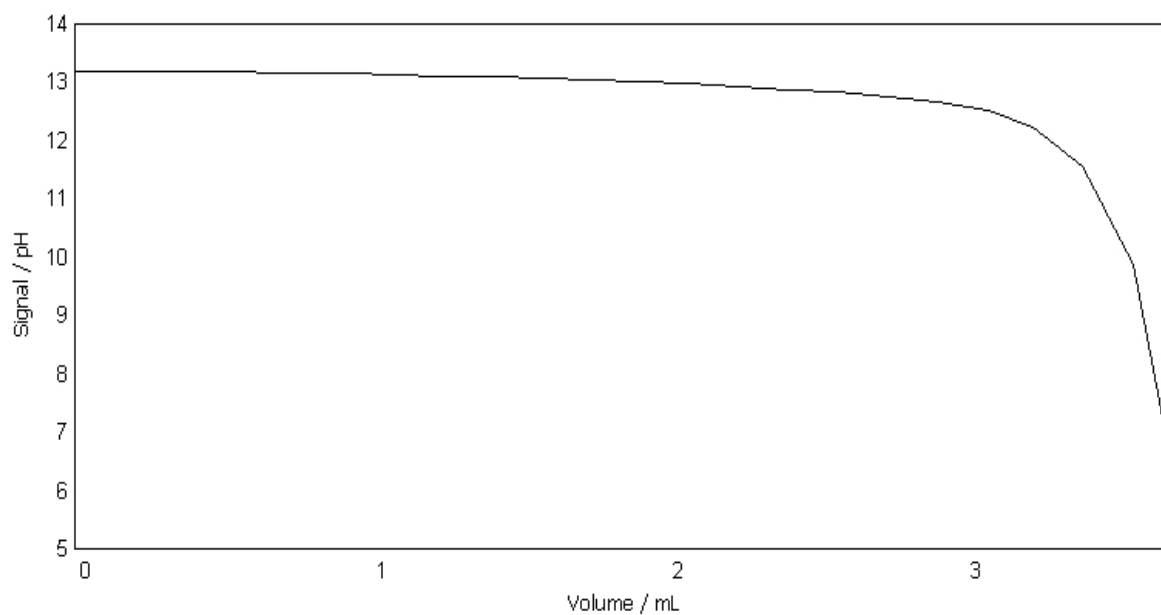
Titrant HCl c = 2.0 mol/L TITER = 1.000
 Sensor DG111-SC
 Sample 1/6

Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0000	NaN	13.155	NaN	0	25.0
0.0005	0.0005	13.172	0.017	1	25.0
0.0020	0.0015	13.176	0.004	2	25.0
0.0050	0.0030	13.174	-0.002	3	25.0
0.0085	0.0035	13.176	0.002	4	25.0
0.0150	0.0065	13.182	0.006	5	25.0
0.0250	0.0100	13.186	0.004	6	25.0
0.0405	0.0155	13.189	0.003	7	25.0
0.0615	0.0210	13.184	-0.005	8	25.0
0.0875	0.0260	13.186	0.002	9	25.0
0.1230	0.0355	13.190	0.004	10	25.0
0.1665	0.0435	13.190	0.000	11	25.0
0.2205	0.0540	13.186	-0.004	12	25.0
0.2850	0.0645	13.187	0.001	13	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

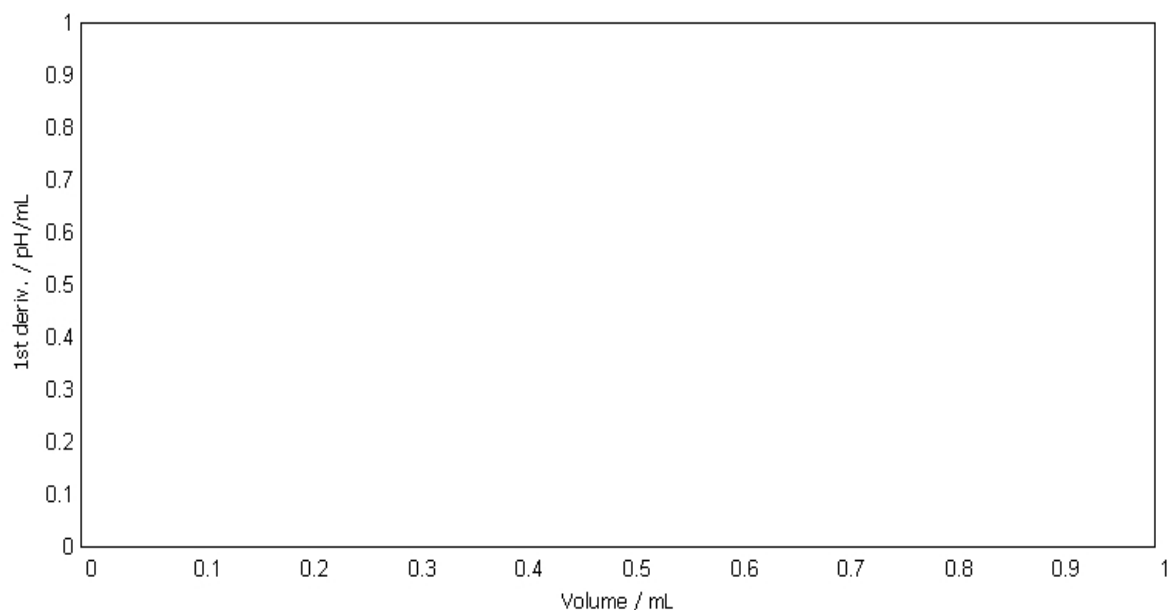
Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.3615	0.0765	13.184	-0.003	14	25.0
0.4515	0.0900	13.174	-0.010	15	25.0
0.5545	0.1030	13.175	0.001	16	25.0
0.6585	0.1040	13.166	-0.009	17	25.0
0.7855	0.1270	13.154	-0.012	18	25.0
0.9250	0.1395	13.145	-0.009	19	25.0
1.0755	0.1505	13.134	-0.011	20	25.0
1.2405	0.1650	13.113	-0.021	21	25.0
1.4095	0.1690	13.093	-0.020	22	25.0
1.5775	0.1680	13.073	-0.020	23	25.0
1.7460	0.1685	13.044	-0.029	24	25.0
1.8975	0.1515	13.014	-0.030	25	25.0
2.0665	0.1690	12.984	-0.030	26	25.0
2.2350	0.1685	12.934	-0.050	27	25.0
2.4035	0.1685	12.882	-0.052	28	25.0
2.5720	0.1685	12.839	-0.043	29	25.0
2.7415	0.1695	12.749	-0.090	30	25.0
2.9100	0.1685	12.653	-0.096	31	25.0
3.0790	0.1690	12.520	-0.133	32	25.0
3.2305	0.1515	12.238	-0.282	33	25.0
3.3995	0.1690	11.547	-0.691	34	25.0
3.5685	0.1690	9.867	-1.680	35	25.0
3.7045	0.1360	6.265	-3.602	36	25.0

E - V curve EP titration [1]
Sample 1/6



Method: Iodine Iodine Titer with EQP
Start time: 8/15/2012 2:24:16 PM 8/15/2012 1:52:42 PM

dE/dV - V curve EP titration [1]
Sample 1/6



Measured values EQP titration [2]

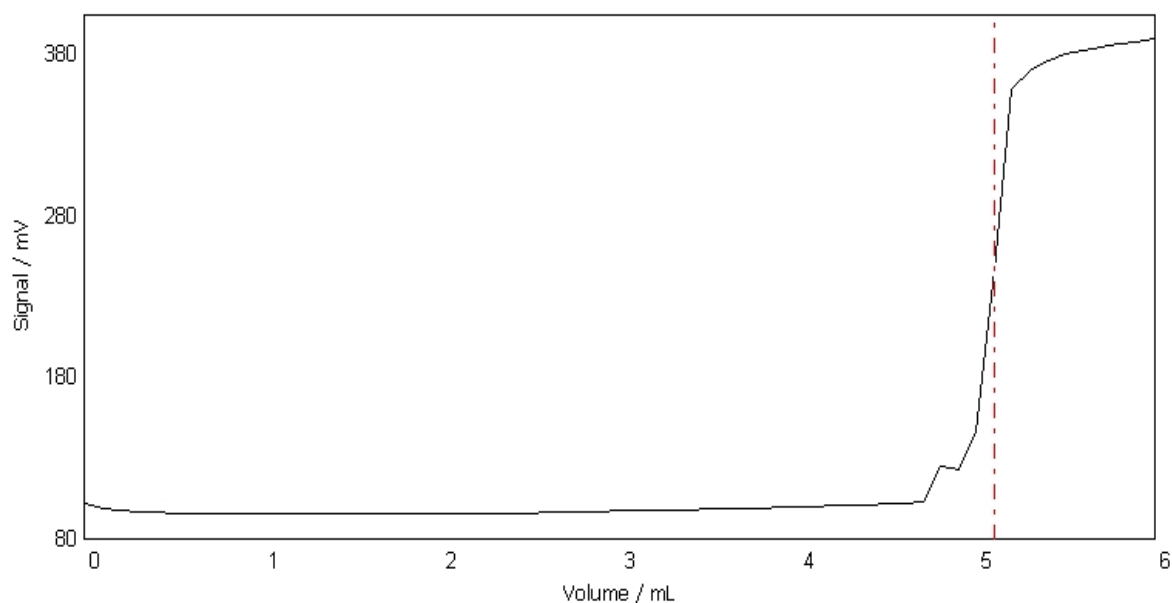
Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Sample 1/6

Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
0.0000	NaN	102.1	NaN	NaN	0	25.0
0.1000	0.1000	98.9	-3.2	NaN	16	25.0
0.2000	0.1000	97.6	-1.3	NaN	20	25.0
0.3000	0.1000	96.8	-0.8	NaN	26	25.0
0.4000	0.1000	96.4	-0.4	NaN	31	25.0
0.5000	0.1000	96.1	-0.3	-1.68	36	25.0
0.6000	0.1000	95.8	-0.3	-1.67	41	25.0
0.7000	0.1000	95.6	-0.2	-1.41	46	25.0
0.8000	0.1000	95.6	0.0	-1.09	51	25.0
0.9000	0.1000	95.4	-0.2	-0.52	56	25.0
1.0000	0.1000	95.4	0.0	-0.28	61	25.0
1.1000	0.1000	95.3	-0.1	-0.35	66	25.0
1.2000	0.1000	95.4	0.1	-0.28	71	25.0
1.3000	0.1000	95.4	0.0	-0.26	76	25.0
1.4000	0.1000	95.2	-0.2	-0.31	81	25.0
1.5000	0.1000	95.2	0.0	-0.18	86	25.0
1.6000	0.1000	95.3	0.1	-0.24	91	25.0
1.7000	0.1000	95.2	-0.1	0.20	96	25.0
1.8000	0.1000	95.3	0.1	0.41	101	25.0
1.9000	0.1000	95.3	0.0	0.63	106	25.0
2.0000	0.1000	95.3	0.0	1.06	111	25.0
2.1000	0.1000	95.6	0.3	1.18	116	25.0
2.2000	0.1000	95.6	0.0	1.61	121	25.0
2.3000	0.1000	95.9	0.3	2.15	126	25.0
2.4000	0.1000	96.0	0.1	2.08	131	25.0
2.5000	0.1000	96.1	0.1	2.01	136	25.0
2.6000	0.1000	96.7	0.6	2.13	141	25.0
2.7000	0.1000	96.7	0.0	2.01	146	25.0
2.8000	0.1000	96.7	0.0	2.07	151	25.0
2.9000	0.1000	97.1	0.4	1.91	156	25.0
3.0000	0.1000	97.3	0.2	1.91	161	25.0
3.1000	0.1000	97.5	0.2	2.42	166	25.0
3.2000	0.1000	97.7	0.2	2.36	171	25.0
3.3000	0.1000	97.9	0.2	2.34	176	25.0
3.4000	0.1000	98.2	0.3	2.62	181	25.0
3.5000	0.1000	98.5	0.3	2.60	186	25.0
3.6000	0.1000	98.7	0.2	2.44	191	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

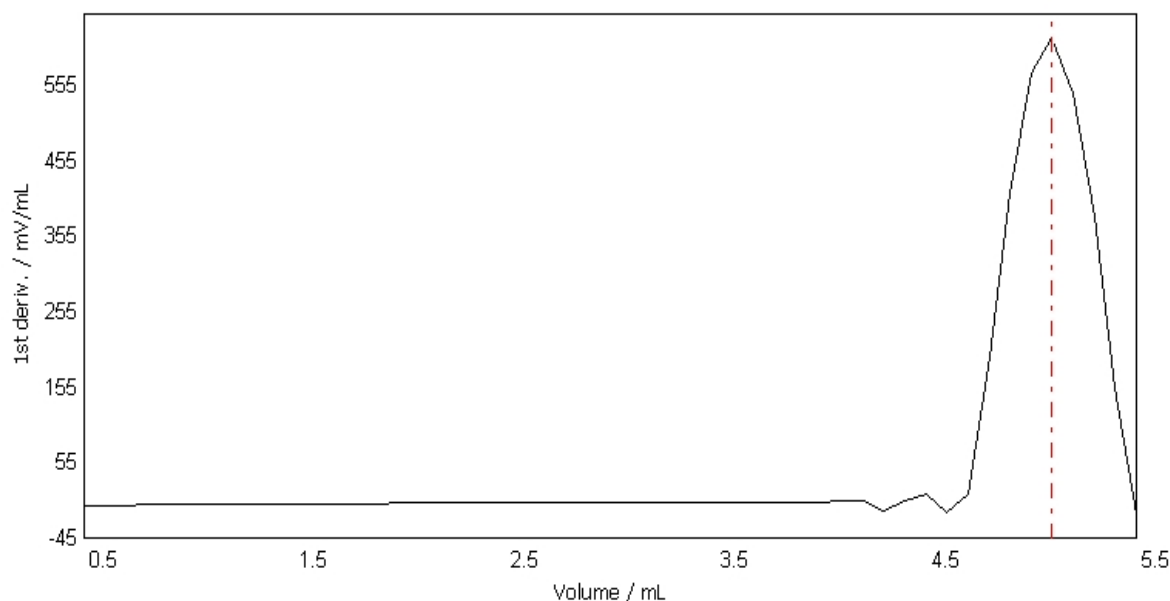
	Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
	3.7000	0.1000	99.0	0.3	2.34	196	25.0
	3.8000	0.1000	99.2	0.2	2.54	201	25.0
	3.9000	0.1000	99.4	0.2	2.67	206	25.0
	4.0000	0.1000	99.7	0.3	3.05	212	25.0
	4.1000	0.1000	100.1	0.4	3.46	216	25.0
	4.2000	0.1000	100.5	0.4	3.79	222	25.0
	4.3000	0.1000	100.7	0.2	-8.36	227	25.0
	4.4000	0.1000	101.3	0.6	5.18	232	25.0
	4.5000	0.1000	101.7	0.4	12.96	237	25.0
	4.6000	0.1000	102.1	0.4	-12.36	242	25.0
	4.7000	0.1000	102.7	0.6	13.51	247	25.0
	4.8000	0.1000	124.5	21.8	194.53	252	25.0
	4.9000	0.1000	123.1	-1.4	411.04	257	25.0
	5.0000	0.1000	146.7	23.6	569.97	262	25.0
EQP1	5.098780	NaN	245.0	NaN	617.85	NaN	NaN
	5.1000	0.1000	246.2	99.5	617.55	267	25.0
	5.2000	0.1000	358.4	112.2	543.27	272	25.0
	5.3000	0.1000	370.0	11.6	380.76	277	25.0
	5.4000	0.1000	375.9	5.9	154.41	282	25.0
	5.5000	0.1000	379.6	3.7	-13.82	287	25.0
	5.6000	0.1000	382.4	2.8	NaN	292	25.0
	5.7000	0.1000	384.5	2.1	NaN	297	25.0
	5.8000	0.1000	386.2	1.7	NaN	302	25.0
	5.9000	0.1000	387.8	1.6	NaN	307	25.0
	6.0000	0.1000	389.2	1.4	NaN	312	25.0

E - V curve EQP titration [2]
Sample 1/6



Method: Iodine Iodine Titer with EQP
Start time: 8/15/2012 2:24:16 PM 8/15/2012 1:52:42 PM

dE/dV - V curve EQP titration [2]
Sample 1/6



Raw data

Sample

No. 2/6
Standard As₂O₃
Type of standard solid
Comment
Titration stand Rondo60/1A
Weight m = 0.02442 g
Correction factor f = 1.0
Purity p = 100.00 %
Temperature T = 25.0 oC
Sample start 8/15/2012 2:33:40 PM
Sample end 8/15/2012 2:43:44 PM

EP titration [1]

Titrant HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Start potential EST = 13.180 pH
Consumption EP VEQ1 = 3.694344 mL
Q1 = 7.388687 mmol
EEQ1 = 6.500 pH
Excess VEX = 0.020656 mL
QEX = 0.041313 mmol
End VEND = 3.715000 mL
QEND = 7.430000 mmol
Termination at EP
Time t = 0:46 min

EQP titration [2]

Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Start potential EST = 94.8 mV
Predispense EPD = 93.9 mV
VPD = 0.0000 mL

Method:	Iodine	Iodine Titer with EQP	8/15/2012 1:52:42 PM
Start time:	8/15/2012 2:24:16 PM		

No. of EQPs and cand.		nEQ = 1
Consumption	EQP1	VEQ1 = 4.967919 mL Q1 = 0.497641 mmol EEQ1 = 212.7 mV EHN1 = 47.0 mV
Excess		VEX = 0.932081 mL QEX = 0.093367 mmol
End		VEND = 5.9000 mL QEND = 0.591009 mmol
Termination at Time	EQPs t = 5:22 min	

Calculation

Result	R1 = 0.99384 -- Titer
Formula	$R1 = m / (VEQ[2] * c[2] * C)$
Constant	$M / (10 * p * z)$ C = 0.04946
Molar mass	M[As2O3] = 197.84 g/mol
Equivalent number	z[As2O3] = 4
Duration	tUSE = 09:30 min

Measured values EP titration [1]

Titrant	HCl c = 2.0 mol/L TITER = 1.000
Sensor	DG111-SC
Sample	2/6

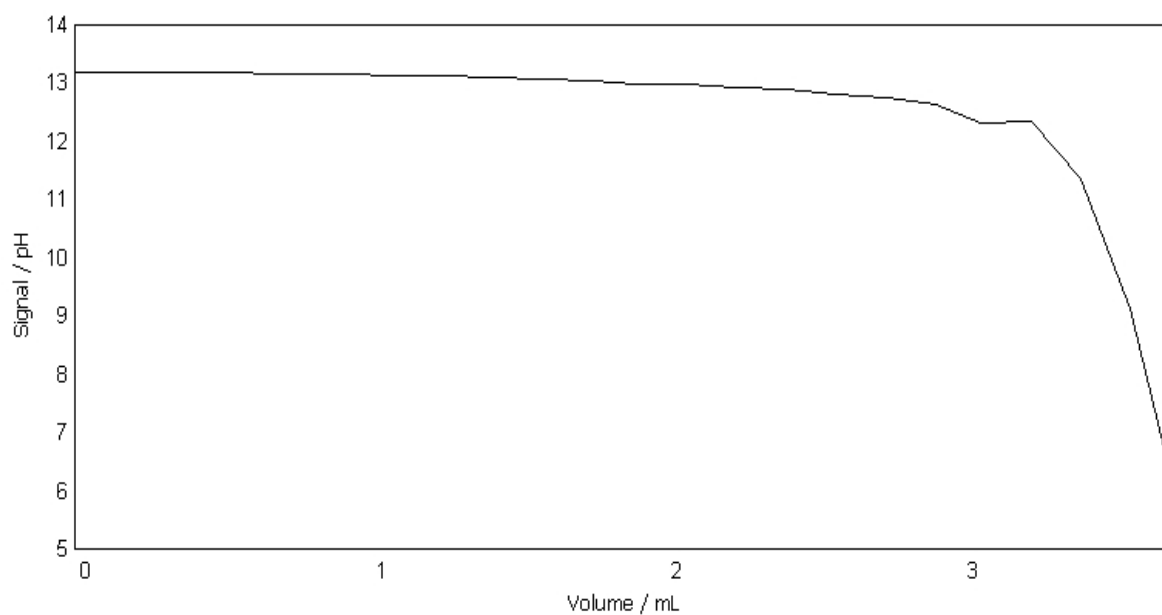
Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0000	NaN	13.180	NaN	0	25.0
0.0005	0.0005	13.191	0.011	1	25.0
0.0020	0.0015	13.192	0.001	2	25.0
0.0050	0.0030	13.195	0.003	3	25.0
0.0090	0.0040	13.194	-0.001	4	25.0
0.0150	0.0060	13.199	0.005	5	25.0
0.0250	0.0100	13.201	0.002	6	25.0
0.0405	0.0155	13.199	-0.002	7	25.0
0.0595	0.0190	13.197	-0.002	8	25.0
0.0880	0.0285	13.200	0.003	9	25.0
0.1230	0.0350	13.198	-0.002	10	25.0
0.1665	0.0435	13.197	-0.001	11	25.0
0.2205	0.0540	13.191	-0.006	12	25.0
0.2850	0.0645	13.188	-0.003	13	25.0
0.3615	0.0765	13.192	0.004	14	25.0
0.4515	0.0900	13.184	-0.008	15	25.0
0.5430	0.0915	13.180	-0.004	16	25.0
0.6580	0.1150	13.166	-0.014	17	25.0
0.7860	0.1280	13.154	-0.012	18	25.0
0.9250	0.1390	13.148	-0.006	19	25.0
1.0760	0.1510	13.134	-0.014	20	25.0
1.2405	0.1645	13.118	-0.016	21	25.0
1.4095	0.1690	13.094	-0.024	22	25.0
1.5785	0.1690	13.075	-0.019	23	25.0
1.7470	0.1685	13.038	-0.037	24	25.0
1.8990	0.1520	12.986	-0.052	25	25.0
2.0675	0.1685	12.983	-0.003	26	25.0
2.2365	0.1690	12.935	-0.048	27	25.0
2.4055	0.1690	12.891	-0.044	28	25.0
2.5740	0.1685	12.813	-0.078	29	25.0
2.7430	0.1690	12.746	-0.067	30	25.0
2.9120	0.1690	12.647	-0.099	31	25.0
3.0640	0.1520	12.316	-0.331	32	25.0
3.2325	0.1685	12.338	0.022	33	25.0
3.4015	0.1690	11.345	-0.993	34	25.0
3.5705	0.1690	9.132	-2.213	35	25.0
3.7150	0.1445	6.061	-3.071	36	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP

8/15/2012 1:52:42 PM

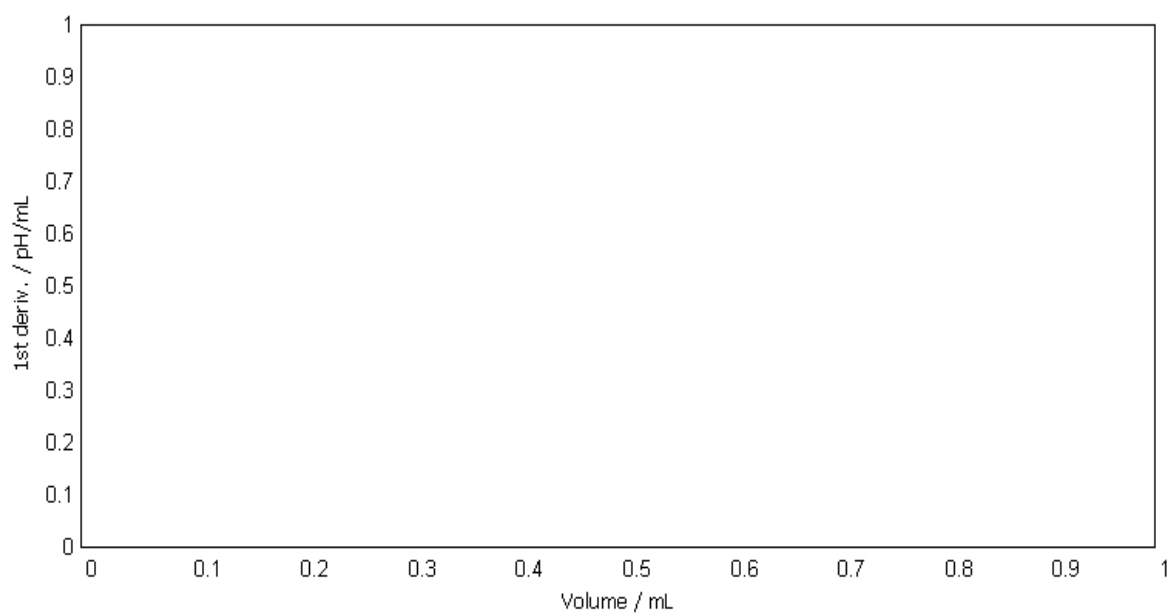
E - V curve EP titration [1]

Sample 2/6



dE/dV - V curve EP titration [1]

Sample 2/6



Measured values EQP titration [2]

Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Sample 2/6

Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature °C
0.0000	NaN	94.8	NaN	NaN	0	25.0
0.1000	0.1000	57.0	-37.8	NaN	16	25.0
0.2000	0.1000	49.1	-7.9	NaN	21	25.0
0.3000	0.1000	45.5	-3.6	NaN	26	25.0
0.4000	0.1000	43.5	-2.0	NaN	31	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

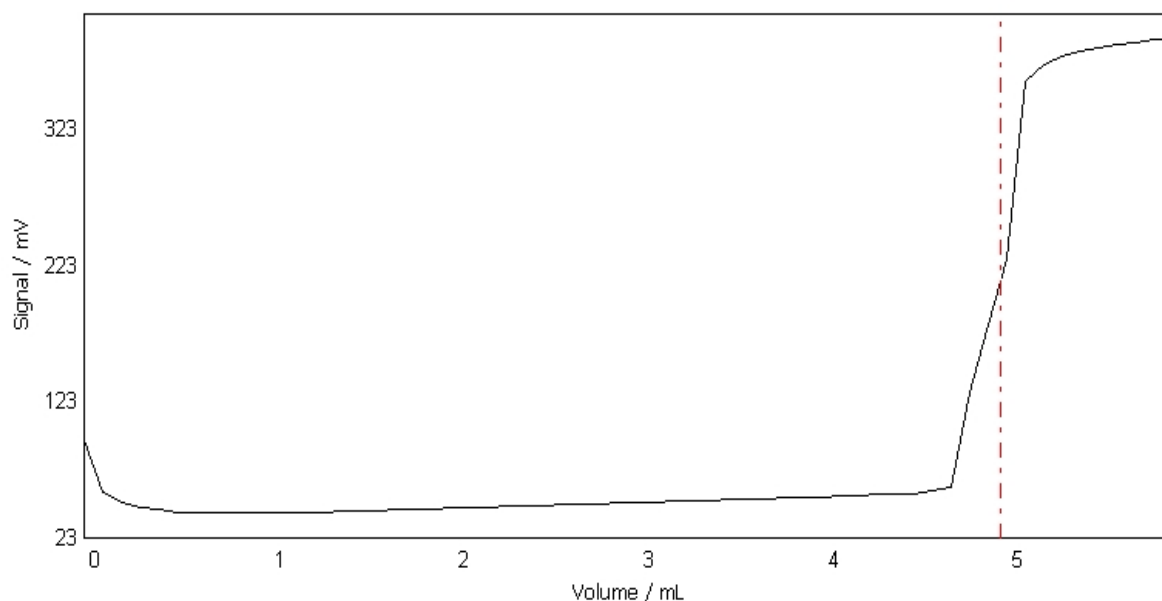
Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
0.5000	0.1000	42.2	-1.3	8.42	36	25.0
0.6000	0.1000	41.6	-0.6	-2.73	41	25.0
0.7000	0.1000	41.1	-0.5	-1.46	46	25.0
0.8000	0.1000	41.2	0.1	0.30	51	25.0
0.9000	0.1000	41.1	-0.1	1.34	56	25.0
1.0000	0.1000	41.5	0.4	2.01	61	25.0
1.1000	0.1000	41.5	0.0	2.49	66	25.0
1.2000	0.1000	41.9	0.4	2.71	71	25.0
1.3000	0.1000	42.0	0.1	3.11	76	25.0
1.4000	0.1000	42.5	0.5	3.46	81	25.0
1.5000	0.1000	42.8	0.3	3.91	86	25.0
1.6000	0.1000	43.2	0.4	3.94	91	25.0
1.7000	0.1000	43.6	0.4	4.23	96	25.0
1.8000	0.1000	44.1	0.5	4.24	101	25.0
1.9000	0.1000	44.4	0.3	4.46	106	25.0
2.0000	0.1000	44.9	0.5	4.36	111	25.0
2.1000	0.1000	45.4	0.5	4.41	116	25.0
2.2000	0.1000	45.8	0.4	4.23	121	25.0
2.3000	0.1000	46.2	0.4	4.31	126	25.0
2.4000	0.1000	46.6	0.4	4.15	131	25.0
2.5000	0.1000	47.1	0.5	4.30	136	25.0
2.6000	0.1000	47.4	0.3	4.24	141	25.0
2.7000	0.1000	48.0	0.6	4.31	146	25.0
2.8000	0.1000	48.3	0.3	4.24	151	25.0
2.9000	0.1000	48.8	0.5	4.30	156	25.0
3.0000	0.1000	49.1	0.3	4.20	161	25.0
3.1000	0.1000	49.7	0.6	4.20	166	25.0
3.2000	0.1000	50.0	0.3	4.36	172	25.0
3.3000	0.1000	50.5	0.5	4.24	176	25.0
3.4000	0.1000	50.8	0.3	4.15	182	25.0
3.5000	0.1000	51.4	0.6	4.04	186	25.0
3.6000	0.1000	51.7	0.3	4.08	192	25.0
3.7000	0.1000	52.1	0.4	4.14	196	25.0
3.8000	0.1000	52.5	0.4	4.47	202	25.0
3.9000	0.1000	53.0	0.5	4.43	207	25.0
4.0000	0.1000	53.4	0.4	4.55	212	25.0
4.1000	0.1000	54.0	0.6	3.69	217	25.0
4.2000	0.1000	54.4	0.4	3.91	222	25.0
4.3000	0.1000	54.7	0.3	-33.96	227	25.0
4.4000	0.1000	55.3	0.6	-20.08	232	25.0
4.5000	0.1000	55.9	0.6	53.29	237	25.0
4.6000	0.1000	57.9	2.0	125.18	242	25.0
4.7000	0.1000	59.7	1.8	329.48	247	25.0
4.8000	0.1000	129.4	69.7	540.48	252	25.0
4.9000	0.1000	179.1	49.7	665.99	257	25.0
EQP1 4.967919	NaN	212.7	NaN	670.47	NaN	NaN
5.0000	0.1000	228.5	49.4	660.14	262	25.0
5.1000	0.1000	358.4	129.9	528.53	267	25.0
5.2000	0.1000	370.9	12.5	325.83	272	25.0
5.3000	0.1000	376.8	5.9	160.23	277	25.0
5.4000	0.1000	380.6	3.8	16.92	282	25.0
5.5000	0.1000	383.5	2.9	NaN	287	25.0
5.6000	0.1000	385.7	2.2	NaN	292	25.0
5.7000	0.1000	387.4	1.7	NaN	297	25.0
5.8000	0.1000	389.0	1.6	NaN	302	25.0
5.9000	0.1000	390.2	1.2	NaN	307	25.0

Method: Iodine Iodine Titer with EQP

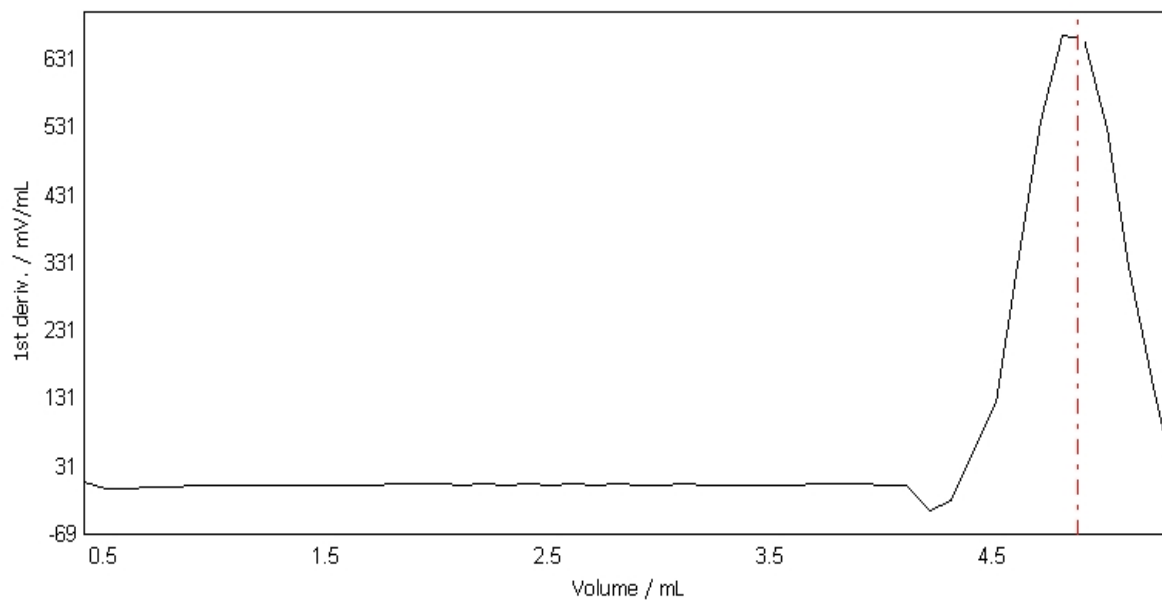
8/15/2012 1:52:42 PM

Start time: 8/15/2012 2:24:16 PM

E - V curve EQP titration [2]
Sample 2/6



dE/dV - V curve EQP titration [2]
Sample 2/6



Raw data

Sample

No.	3/6
Standard	As2O3
Type of standard	solid
Comment	
Titration stand	Rondo60/1A
Weight	m = 0.02845 g
Correction factor	f = 1.0
Purity	p = 100.00 %

Method: Iodine Iodine Titer with EQP 8/15/2012 1:52:42 PM
Start time: 8/15/2012 2:24:16 PM

Temperature T = 25.0 oC
Sample start 8/15/2012 2:43:44 PM
Sample end 8/15/2012 2:54:58 PM

EP titration [1]

Titrant HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Start potential EST = 13.140 pH
Consumption EP VEQ1 = 3.574013 mL
Q1 = 7.148026 mmol
EEQ1 = 6.500 pH
Excess VEX = 0.013487 mL
QEX = 0.026973 mmol
End VEND = 3.587500 mL
QEND = 7.174999 mmol
Termination at EP
Time t = 0:46 min

EQP titration [2]

Titrant 1/2 I2 c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Start potential EST = 86.7 mV
Predispense EPD = 85.4 mV
VPD = 0.0000 mL
nEQ = 1
No. of EQPs and cand. EQP1 VEQ1 = 5.792064 mL
Consumption Q1 = 0.580197 mmol
EEQ1 = 224.6 mV
EHN1 = 68.8 mV
Excess VEX = 0.907936 mL
QEX = 0.090949 mmol
End VEND = 6.7000 mL
QEND = 0.671146 mmol
Termination at EQPs
Time t = 6:04 min

Calculation

Result R1 = 0.99310 -- Titer
Formula $R1 = m / (VEQ[2] \cdot c[2] \cdot C)$
Constant $M / (10 \cdot p \cdot z)$
C = 0.04946
Molar mass $M[As_2O_3] = 197.84 \text{ g/mol}$
Equivalent number $z[As_2O_3] = 4$
Duration tUSE = 10:40 min

Measured values EP titration [1]

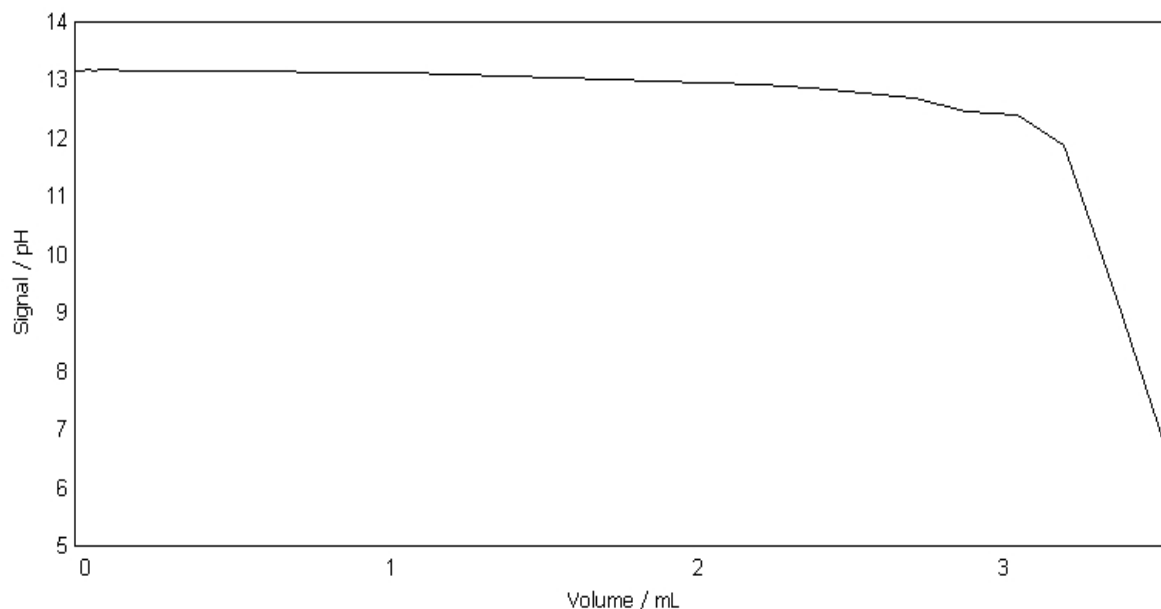
Titrant HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Sample 3/6

Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0000	NaN	13.140	NaN	0	25.0
0.0005	0.0005	13.156	0.016	1	25.0
0.0025	0.0020	13.161	0.005	2	25.0
0.0050	0.0025	13.157	-0.004	3	25.0
0.0090	0.0040	13.158	0.001	4	25.0
0.0150	0.0060	13.168	0.010	5	25.0
0.0250	0.0100	13.166	-0.002	6	25.0
0.0405	0.0155	13.173	0.007	7	25.0
0.0595	0.0190	13.163	-0.010	8	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

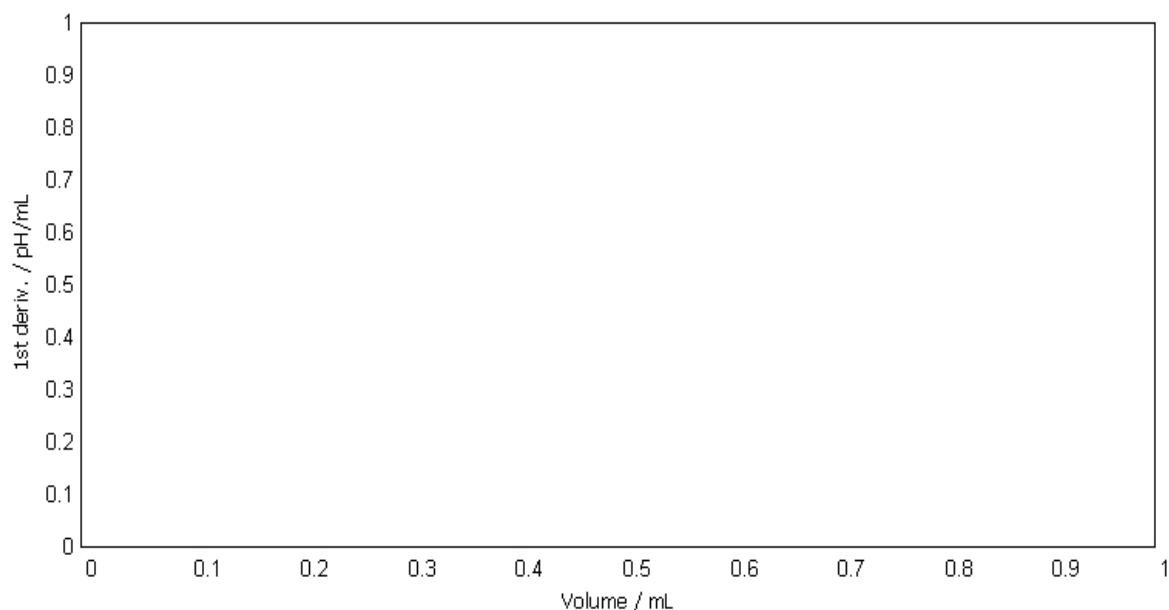
Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0880	0.0285	13.174	0.011	9	25.0
0.1230	0.0350	13.173	-0.001	10	25.0
0.1665	0.0435	13.166	-0.007	11	25.0
0.2200	0.0535	13.172	0.006	12	25.0
0.2850	0.0650	13.168	-0.004	13	25.0
0.3615	0.0765	13.156	-0.012	14	25.0
0.4515	0.0900	13.158	0.002	15	25.0
0.5435	0.0920	13.152	-0.006	16	25.0
0.6580	0.1145	13.147	-0.005	17	25.0
0.7855	0.1275	13.136	-0.011	18	25.0
0.9245	0.1390	13.120	-0.016	19	25.0
1.0755	0.1510	13.116	-0.004	20	25.0
1.2405	0.1650	13.097	-0.019	21	25.0
1.4090	0.1685	13.061	-0.036	22	25.0
1.5775	0.1685	13.049	-0.012	23	25.0
1.7460	0.1685	13.018	-0.031	24	25.0
1.8980	0.1520	12.983	-0.035	25	25.0
2.0665	0.1685	12.964	-0.019	26	25.0
2.2355	0.1690	12.913	-0.051	27	25.0
2.4045	0.1690	12.865	-0.048	28	25.0
2.5735	0.1690	12.790	-0.075	29	25.0
2.7425	0.1690	12.681	-0.109	30	25.0
2.9110	0.1685	12.466	-0.215	31	25.0
3.0795	0.1685	12.405	-0.061	32	25.0
3.2320	0.1525	11.877	-0.528	33	25.0
3.4000	0.1680	9.274	-2.603	34	25.0
3.5875	0.1875	6.285	-2.989	35	25.0

E - V curve EP titration [1]
Sample 3/6



Method: Iodine **Iodine Titer with EQP** **8/15/2012 1:52:42 PM**
Start time: 8/15/2012 2:24:16 PM

dE/dV - V curve **EP titration [1]**
Sample 3/6



Measured values **EQP titration [2]**

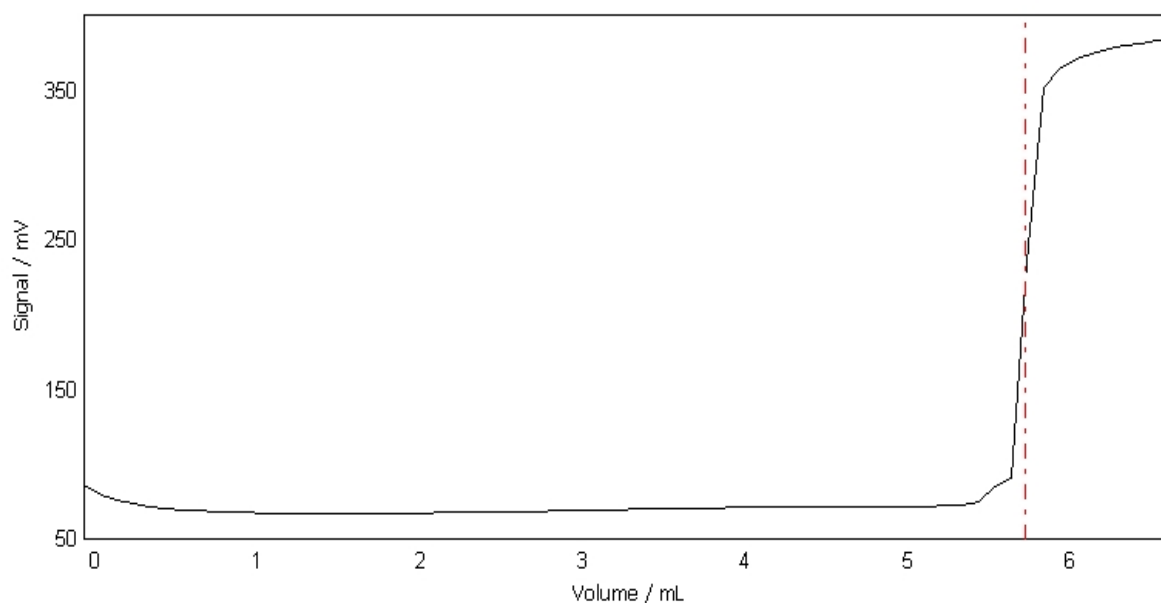
Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Sample 3/6

Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
0.0000	NaN	86.7	NaN	NaN	0	25.0
0.1000	0.1000	78.9	-7.8	NaN	16	25.0
0.2000	0.1000	75.5	-3.4	NaN	21	25.0
0.3000	0.1000	73.3	-2.2	NaN	26	25.0
0.4000	0.1000	71.6	-1.7	NaN	31	25.0
0.5000	0.1000	70.3	-1.3	-8.67	36	25.0
0.6000	0.1000	69.4	-0.9	-7.82	41	25.0
0.7000	0.1000	68.7	-0.7	-6.07	46	25.0
0.8000	0.1000	68.1	-0.6	-4.44	51	25.0
0.9000	0.1000	67.7	-0.4	-3.12	56	25.0
1.0000	0.1000	67.6	-0.1	-2.32	61	25.0
1.1000	0.1000	67.2	-0.4	-1.63	66	25.0
1.2000	0.1000	67.2	0.0	-1.16	71	25.0
1.3000	0.1000	67.1	-0.1	-0.75	76	25.0
1.4000	0.1000	66.9	-0.2	-0.41	81	25.0
1.5000	0.1000	67.0	0.1	0.19	86	25.0
1.6000	0.1000	67.0	0.0	0.40	91	25.0
1.7000	0.1000	67.1	0.1	0.70	96	25.0
1.8000	0.1000	67.1	0.0	0.87	101	25.0
1.9000	0.1000	67.3	0.2	0.85	106	25.0
2.0000	0.1000	67.3	0.0	1.10	111	25.0
2.1000	0.1000	67.4	0.1	1.20	116	25.0
2.2000	0.1000	67.6	0.2	1.29	121	25.0
2.3000	0.1000	67.7	0.1	1.50	126	25.0
2.4000	0.1000	67.9	0.2	1.76	131	25.0
2.5000	0.1000	68.0	0.1	1.80	136	25.0
2.6000	0.1000	68.2	0.2	1.80	141	25.0
2.7000	0.1000	68.5	0.3	2.01	146	25.0
2.8000	0.1000	68.6	0.1	1.93	151	25.0
2.9000	0.1000	68.8	0.2	2.06	156	25.0
3.0000	0.1000	69.0	0.2	2.16	161	25.0
3.1000	0.1000	69.3	0.3	2.34	166	25.0
3.2000	0.1000	69.4	0.1	2.57	171	25.0
3.3000	0.1000	69.8	0.4	2.42	176	25.0
3.4000	0.1000	70.0	0.2	2.19	181	25.0
3.5000	0.1000	70.2	0.2	1.95	186	25.0
3.6000	0.1000	70.4	0.2	1.92	192	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

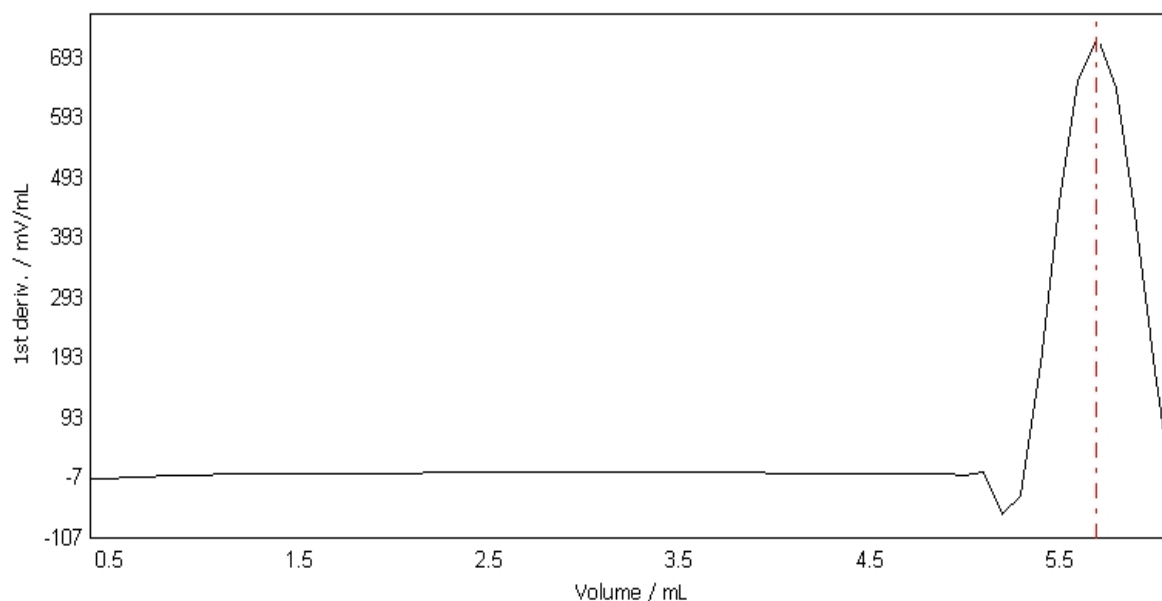
	Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
	3.7000	0.1000	70.5	0.1	1.63	196	25.0
	3.8000	0.1000	70.7	0.2	1.71	202	25.0
	3.9000	0.1000	70.9	0.2	1.56	207	25.0
	4.0000	0.1000	71.1	0.2	1.52	212	25.0
	4.1000	0.1000	71.1	0.0	1.10	217	25.0
	4.2000	0.1000	71.3	0.2	0.59	222	25.0
	4.3000	0.1000	71.3	0.0	0.30	227	25.0
	4.4000	0.1000	71.4	0.1	0.03	232	25.0
	4.5000	0.1000	71.2	-0.2	-0.16	237	25.0
	4.6000	0.1000	71.3	0.1	-0.36	242	25.0
	4.7000	0.1000	71.3	0.0	-0.44	247	25.0
	4.8000	0.1000	71.2	-0.1	-0.62	252	25.0
	4.9000	0.1000	71.2	0.0	-0.14	257	25.0
	5.0000	0.1000	71.2	0.0	0.16	262	25.0
	5.1000	0.1000	71.2	0.0	-3.18	267	25.0
	5.2000	0.1000	71.5	0.3	2.13	272	25.0
	5.3000	0.1000	72.2	0.7	-67.27	277	25.0
	5.4000	0.1000	72.8	0.6	-35.69	282	25.0
	5.5000	0.1000	74.5	1.7	184.15	287	25.0
	5.6000	0.1000	84.7	10.2	451.53	292	25.0
	5.7000	0.1000	90.4	5.7	654.88	297	25.0
EQP1	5.792064	NaN	224.6	NaN	725.98	NaN	NaN
	5.8000	0.1000	236.2	145.8	725.98	302	25.0
	5.9000	0.1000	352.6	116.4	642.99	307	25.0
	6.0000	0.1000	365.3	12.7	433.32	312	25.0
	6.1000	0.1000	371.2	5.9	171.93	317	25.0
	6.2000	0.1000	375.2	4.0	-38.23	322	25.0
	6.3000	0.1000	378.1	2.9	NaN	327	25.0
	6.4000	0.1000	380.3	2.2	NaN	332	25.0
	6.5000	0.1000	382.2	1.9	NaN	337	25.0
	6.6000	0.1000	383.7	1.5	NaN	342	25.0
	6.7000	0.1000	385.0	1.3	NaN	347	25.0

E - V curve EQP titration [2]
Sample 3/6



Method: Iodine **Iodine Titer with EQP** **8/15/2012 1:52:42 PM**
Start time: 8/15/2012 2:24:16 PM

dE/dV - V curve **EQP titration [2]**
Sample 3/6



Raw data

Sample

No. 4/6
Standard As₂O₃
Type of standard solid
Comment
Titration stand Rondo60/1A
Weight m = 0.02961 g
Correction factor f = 1.0
Purity p = 100.00 %
Temperature T = 25.0 oC
Sample start 8/15/2012 2:54:59 PM
Sample end 8/15/2012 3:07:24 PM

EP titration [1]

Titrant HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Start potential EST = 13.164 pH
Consumption EP VEQ1 = 3.699783 mL
Q1 = 7.399566 mmol
EEQ1 = 6.500 pH
Excess VEX = 0.011216 mL
QEX = 0.022431 mmol
End VEND = 3.710999 mL
QEND = 7.421997 mmol
Termination at EP
Time t = 0:46 min

EQP titration [2]

Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Start potential EST = 96.7 mV
Predispense EPD = 95.5 mV
VPD = 0.0000 mL

Method: Iodine Iodine Titer with EQP 8/15/2012 1:52:42 PM
Start time: 8/15/2012 2:24:16 PM

No. of EQPs and cand.		nEQ = 1
Consumption	EQP1	VEQ1 = 6.023604 mL Q1 = 0.603390 mmol EEQ1 = 227.1 mV EHN1 = 88.2 mV
Excess		VEX = 0.976396 mL QEX = 0.097807 mmol
End		VEND = 7.0000 mL QEND = 0.701197 mmol
Termination at Time	EQPs t = 6:19 min	

Calculation

Result	R1 = 0.99387 -- Titer
Formula	$R1 = m / (VEQ[2] * c[2] * C)$
Constant	$M / (10 * p * z)$ C = 0.04946
Molar mass	M[As2O3] = 197.84 g/mol
Equivalent number	z[As2O3] = 4
Duration	tUSE = 11:50 min

Measured values EP titration [1]

Titrant	HCl c = 2.0 mol/L TITER = 1.000
Sensor	DG111-SC
Sample	4/6

Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0000	NaN	13.164	NaN	0	25.0
0.0005	0.0005	13.177	0.013	1	25.0
0.0020	0.0015	13.179	0.002	2	25.0
0.0045	0.0025	13.183	0.004	3	25.0
0.0080	0.0035	13.183	0.000	4	25.0
0.0145	0.0065	13.185	0.002	5	25.0
0.0240	0.0095	13.185	0.000	6	25.0
0.0385	0.0145	13.186	0.001	7	25.0
0.0595	0.0210	13.188	0.002	8	25.0
0.0835	0.0240	13.187	-0.001	9	25.0
0.1175	0.0340	13.183	-0.004	10	25.0
0.1595	0.0420	13.175	-0.008	11	25.0
0.2110	0.0515	13.173	-0.002	12	25.0
0.2730	0.0620	13.171	-0.002	13	25.0
0.3480	0.0750	13.175	0.004	14	25.0
0.4340	0.0860	13.170	-0.005	15	25.0
0.5340	0.1000	13.167	-0.003	16	25.0
0.6360	0.1020	13.159	-0.008	17	25.0
0.7605	0.1245	13.144	-0.015	18	25.0
0.8970	0.1365	13.133	-0.011	19	25.0
1.0465	0.1495	13.125	-0.008	20	25.0
1.2090	0.1625	13.109	-0.016	21	25.0
1.3770	0.1680	13.094	-0.015	22	25.0
1.5465	0.1695	13.070	-0.024	23	25.0
1.6985	0.1520	13.046	-0.024	24	25.0
1.8675	0.1690	13.008	-0.038	25	25.0
2.0365	0.1690	12.970	-0.038	26	25.0
2.2050	0.1685	12.928	-0.042	27	25.0
2.3740	0.1690	12.853	-0.075	28	25.0
2.5430	0.1690	12.831	-0.022	29	25.0
2.7115	0.1685	12.747	-0.084	30	25.0
2.8805	0.1690	12.680	-0.067	31	25.0
3.0325	0.1520	12.500	-0.180	32	25.0
3.2015	0.1690	12.279	-0.221	33	25.0
3.3705	0.1690	11.804	-0.475	34	25.0
3.5400	0.1695	9.705	-2.099	35	25.0
3.7110	0.1710	6.275	-3.430	36	25.0

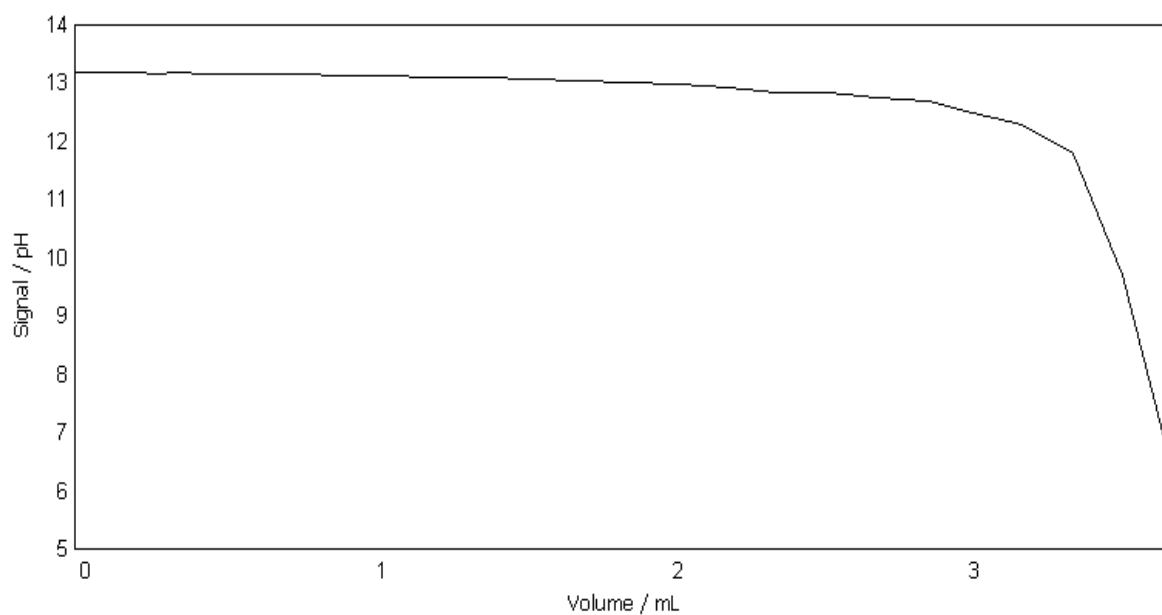
Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP

8/15/2012 1:52:42 PM

E - V curve EP titration [1]

Sample

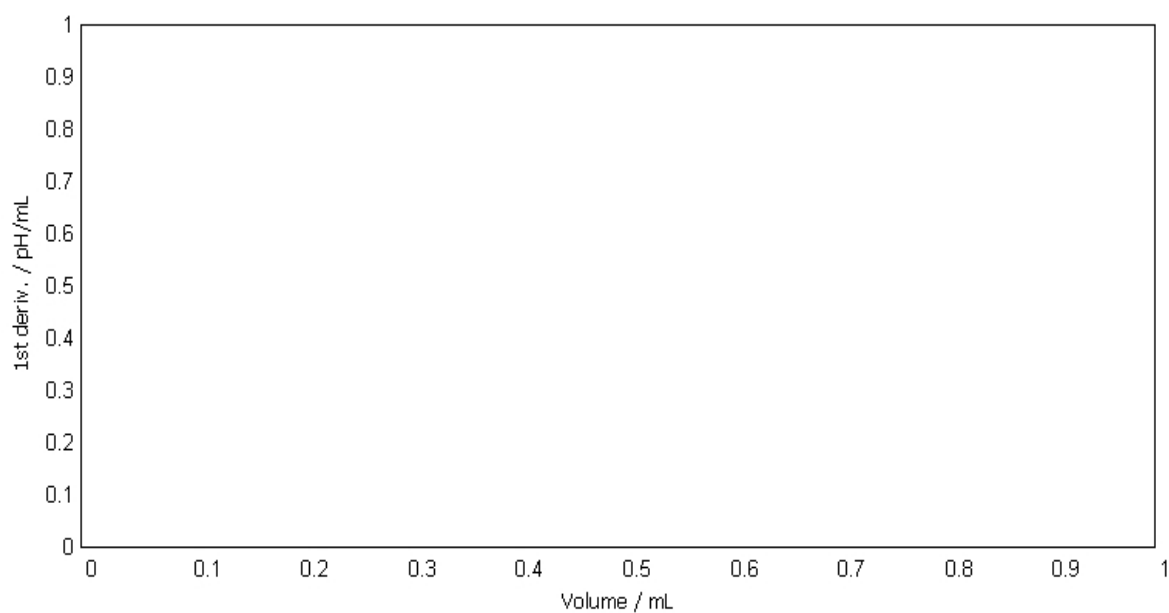
4/6



dE/dV - V curve EP titration [1]

Sample

4/6



Measured values EQP titration [2]

Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Sample 4/6

Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature °C
0.0000	NaN	96.7	NaN	NaN	0	25.0
0.1000	0.1000	92.4	-4.3	NaN	16	25.0
0.2000	0.1000	91.2	-1.2	NaN	20	25.0
0.3000	0.1000	90.3	-0.9	NaN	26	25.0
0.4000	0.1000	90.0	-0.3	NaN	30	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

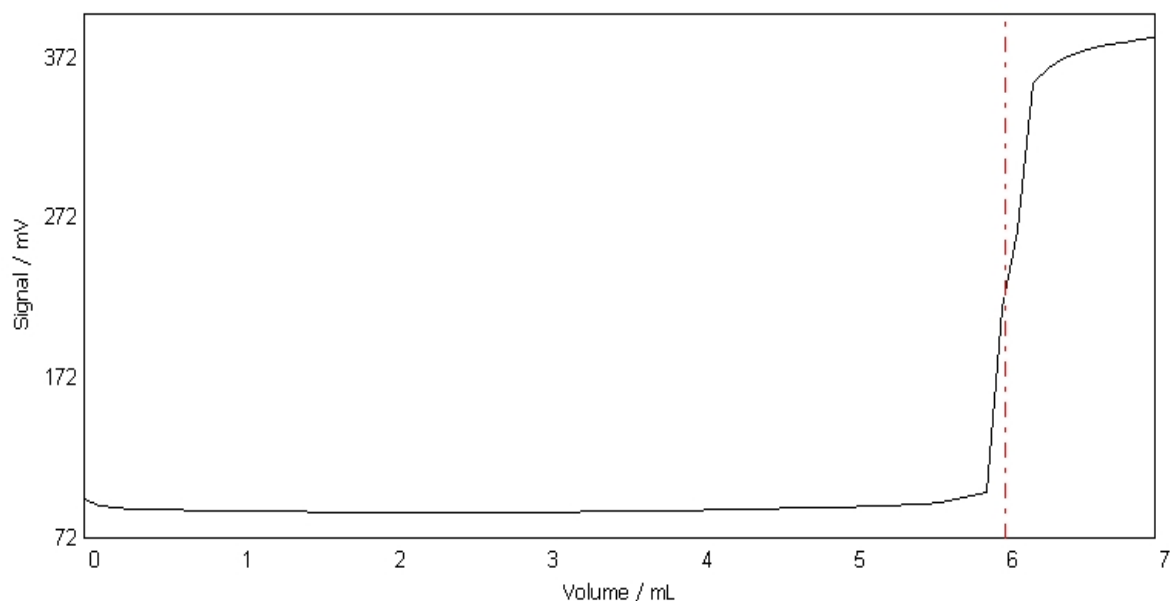
Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
0.5000	0.1000	89.8	-0.2	-0.68	36	25.0
0.6000	0.1000	89.5	-0.3	-1.51	41	25.0
0.7000	0.1000	89.4	-0.1	-1.45	46	25.0
0.8000	0.1000	89.1	-0.3	-1.59	51	25.0
0.9000	0.1000	89.1	0.0	-1.60	56	25.0
1.0000	0.1000	88.9	-0.2	-1.45	61	25.0
1.1000	0.1000	88.7	-0.2	-1.51	66	25.0
1.2000	0.1000	88.6	-0.1	-1.35	71	25.0
1.3000	0.1000	88.4	-0.2	-1.26	76	25.0
1.4000	0.1000	88.4	0.0	-0.94	81	25.0
1.5000	0.1000	88.2	-0.2	-0.84	86	25.0
1.6000	0.1000	88.2	0.0	-0.96	91	25.0
1.7000	0.1000	88.1	-0.1	-0.91	96	25.0
1.8000	0.1000	88.0	-0.1	-0.75	101	25.0
1.9000	0.1000	87.9	-0.1	-0.56	106	25.0
2.0000	0.1000	87.8	-0.1	-0.40	111	25.0
2.1000	0.1000	87.9	0.1	-0.08	116	25.0
2.2000	0.1000	87.9	0.0	0.04	121	25.0
2.3000	0.1000	87.8	-0.1	0.16	126	25.0
2.4000	0.1000	87.9	0.1	0.16	131	25.0
2.5000	0.1000	87.9	0.0	0.18	136	25.0
2.6000	0.1000	87.9	0.0	0.46	141	25.0
2.7000	0.1000	88.0	0.1	0.56	146	25.0
2.8000	0.1000	88.0	0.0	0.48	151	25.0
2.9000	0.1000	88.1	0.1	0.66	156	25.0
3.0000	0.1000	88.2	0.1	0.86	161	25.0
3.1000	0.1000	88.2	0.0	0.94	166	25.0
3.2000	0.1000	88.3	0.1	0.96	171	25.0
3.3000	0.1000	88.5	0.2	0.95	176	25.0
3.4000	0.1000	88.6	0.1	0.99	181	25.0
3.5000	0.1000	88.6	0.0	1.10	186	25.0
3.6000	0.1000	88.7	0.1	1.10	191	25.0
3.7000	0.1000	88.9	0.2	1.30	196	25.0
3.8000	0.1000	89.0	0.1	1.50	201	25.0
3.9000	0.1000	89.2	0.2	1.56	206	25.0
4.0000	0.1000	89.3	0.1	1.44	212	25.0
4.1000	0.1000	89.5	0.2	1.54	216	25.0
4.2000	0.1000	89.6	0.1	1.74	222	25.0
4.3000	0.1000	89.8	0.2	2.00	227	25.0
4.4000	0.1000	90.0	0.2	2.32	232	25.0
4.5000	0.1000	90.3	0.3	2.40	237	25.0
4.6000	0.1000	90.5	0.2	2.46	242	25.0
4.7000	0.1000	90.8	0.3	2.40	247	25.0
4.8000	0.1000	91.0	0.2	2.38	252	25.0
4.9000	0.1000	91.2	0.2	2.37	257	25.0
5.0000	0.1000	91.5	0.3	2.74	262	25.0
5.1000	0.1000	91.8	0.3	3.29	267	25.0
5.2000	0.1000	92.1	0.3	2.95	272	25.0
5.3000	0.1000	92.5	0.4	3.79	277	25.0
5.4000	0.1000	93.1	0.6	6.04	282	25.0
5.5000	0.1000	93.6	0.5	-57.01	287	25.0
5.6000	0.1000	94.1	0.5	-15.30	292	25.0
5.7000	0.1000	96.4	2.3	79.70	297	25.0
5.8000	0.1000	98.2	1.8	287.42	302	25.0
5.9000	0.1000	100.0	1.8	494.49	307	25.0
6.0000	0.1000	215.7	115.7	618.06	312	25.0
EQP1 6.023604	NaN	227.1	NaN	622.63	NaN	NaN
6.1000	0.1000	263.8	48.1	615.64	317	25.0
6.2000	0.1000	355.4	91.6	488.66	322	25.0
6.3000	0.1000	365.6	10.2	279.23	327	25.0
6.4000	0.1000	371.1	5.5	76.48	332	25.0
6.5000	0.1000	374.7	3.6	14.20	337	25.0
6.6000	0.1000	377.5	2.8	NaN	342	25.0
6.7000	0.1000	379.7	2.2	NaN	347	25.0
6.8000	0.1000	381.5	1.8	NaN	352	25.0
6.9000	0.1000	382.8	1.3	NaN	357	25.0
7.0000	0.1000	384.2	1.4	NaN	362	25.0

Method: Iodine Iodine Titer with EQP

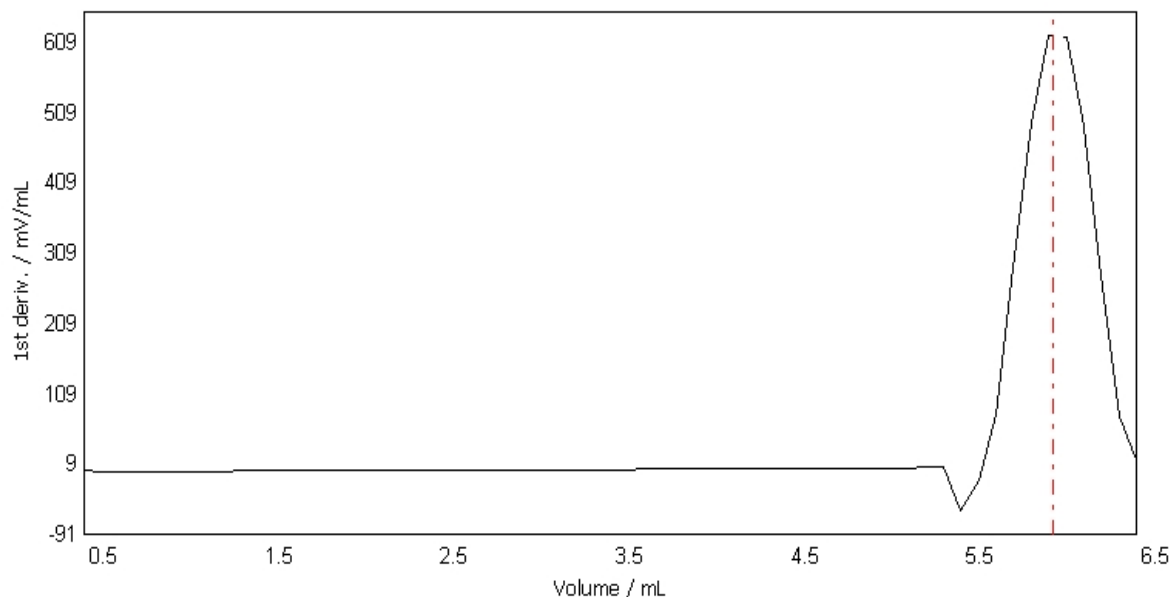
8/15/2012 1:52:42 PM

Start time: 8/15/2012 2:24:16 PM

E - V curve EQP titration [2]
Sample 4/6



dE/dV - V curve EQP titration [2]
Sample 4/6



Raw data

Sample

No.	5/6
Standard	As2O3
Type of standard	solid
Comment	
Titration stand	Rondo60/1A
Weight	m = 0.02209 g
Correction factor	f = 1.0
Purity	p = 100.00 %

Method: Iodine Iodine Titer with EQP **8/15/2012 1:52:42 PM**

Start time: 8/15/2012 2:24:16 PM

Temperature T = 25.0 oC
Sample start 8/15/2012 3:07:24 PM
Sample end 8/15/2012 3:17:38 PM

EP titration [1]

Titration HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Start potential EST = 13.125 pH
Consumption EP VEQ1 = 3.561638 mL
Q1 = 7.123275 mmol
EEQ1 = 6.500 pH
Excess VEX = 0.031862 mL
QEX = 0.063725 mmol
End VEND = 3.593500 mL
QEND = 7.187000 mmol
Termination at EP
Time t = 0:46 min

EQP titration [2]

Titration 1/2 I2 c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Start potential EST = 95.5 mV
Predispense EPD = 94.5 mV
VPD = 0.0000 mL
nEQ = 1
No. of EQPs and cand. EQP1 VEQ1 = 4.496499 mL
Consumption Q1 = 0.450419 mmol
EEQ1 = 242.5 mV
EHN1 = 86.6 mV
Excess VEX = 0.903501 mL
QEX = 0.090505 mmol
End VEND = 5.4000 mL
QEND = 0.540923 mmol
Termination at EQPs
Time t = 4:55 min

Calculation

Result R1 = 0.99327 -- Titer
Formula $R1 = m / (VEQ[2] \cdot c[2] \cdot C)$
Constant $M / (10 \cdot p \cdot z)$
C = 0.04946
Molar mass $M[As_2O_3] = 197.84 \text{ g/mol}$
Equivalent number $z[As_2O_3] = 4$
Duration tUSE = 09:37 min

Measured values EP titration [1]

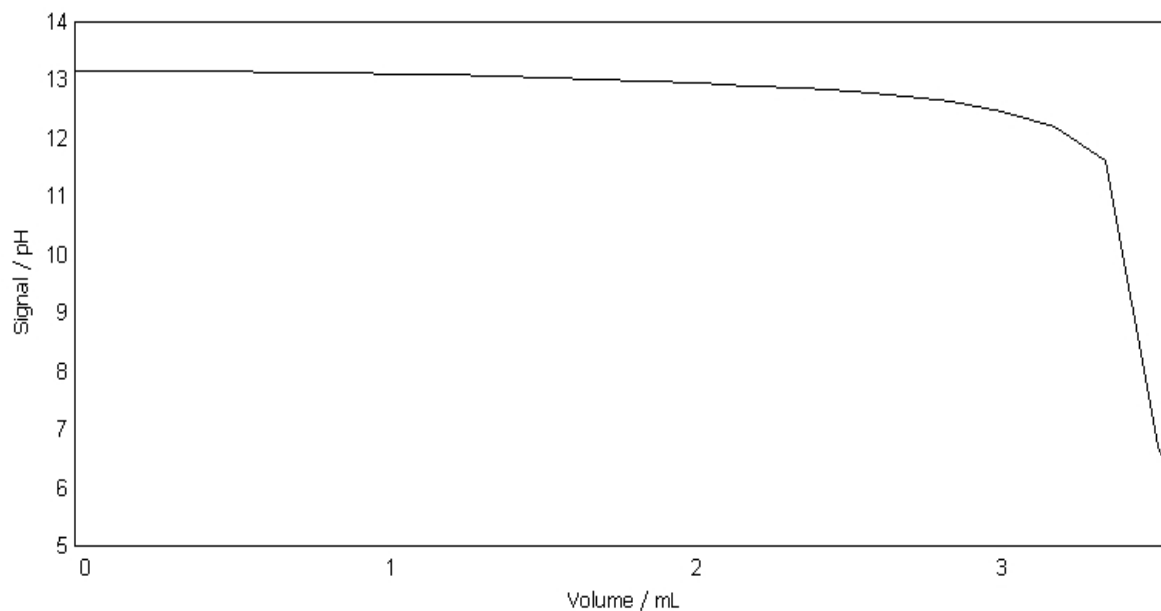
Titration HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Sample 5/6

Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0000	NaN	13.125	NaN	0	25.0
0.0005	0.0005	13.150	0.025	1	25.0
0.0025	0.0020	13.151	0.001	2	25.0
0.0045	0.0020	13.152	0.001	3	25.0
0.0085	0.0040	13.154	0.002	4	25.0
0.0145	0.0060	13.157	0.003	5	25.0
0.0240	0.0095	13.160	0.003	6	25.0
0.0385	0.0145	13.161	0.001	7	25.0
0.0570	0.0185	13.164	0.003	8	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

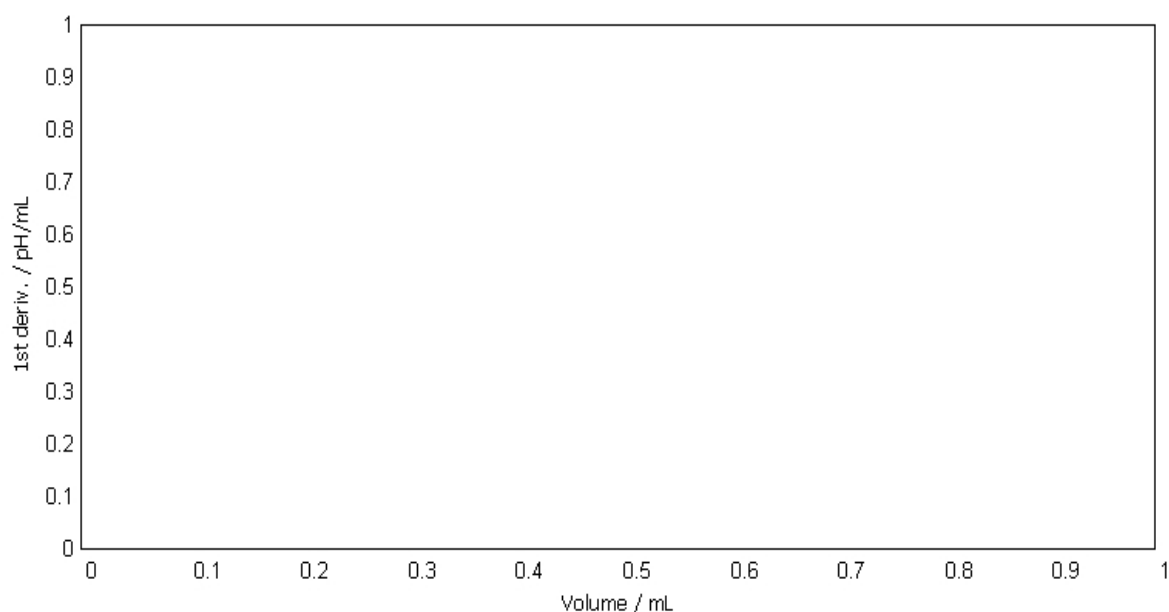
Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0840	0.0270	13.166	0.002	9	25.0
0.1175	0.0335	13.166	0.000	10	25.0
0.1595	0.0420	13.158	-0.008	11	25.0
0.2110	0.0515	13.153	-0.005	12	25.0
0.2730	0.0620	13.154	0.001	13	25.0
0.3475	0.0745	13.157	0.003	14	25.0
0.4340	0.0865	13.154	-0.003	15	25.0
0.5235	0.0895	13.147	-0.007	16	25.0
0.6360	0.1125	13.140	-0.007	17	25.0
0.7605	0.1245	13.135	-0.005	18	25.0
0.8975	0.1370	13.122	-0.013	19	25.0
1.0475	0.1500	13.108	-0.014	20	25.0
1.2100	0.1625	13.093	-0.015	21	25.0
1.3785	0.1685	13.066	-0.027	22	25.0
1.5475	0.1690	13.036	-0.030	23	25.0
1.7000	0.1525	13.017	-0.019	24	25.0
1.8685	0.1685	12.989	-0.028	25	25.0
2.0375	0.1690	12.954	-0.035	26	25.0
2.2060	0.1685	12.909	-0.045	27	25.0
2.3750	0.1690	12.865	-0.044	28	25.0
2.5440	0.1690	12.807	-0.058	29	25.0
2.7130	0.1690	12.730	-0.077	30	25.0
2.8650	0.1520	12.637	-0.093	31	25.0
3.0345	0.1695	12.455	-0.182	32	25.0
3.2035	0.1690	12.205	-0.250	33	25.0
3.3725	0.1690	11.613	-0.592	34	25.0
3.5415	0.1690	6.725	-4.888	35	25.0
3.5935	0.0520	6.144	-0.581	36	25.0

E - V curve EP titration [1]
Sample 5/6



Method: Iodine **Iodine Titer with EQP** **8/15/2012 1:52:42 PM**
Start time: 8/15/2012 2:24:16 PM

dE/dV - V curve **EP titration [1]**
Sample 5/6



Measured values **EQP titration [2]**

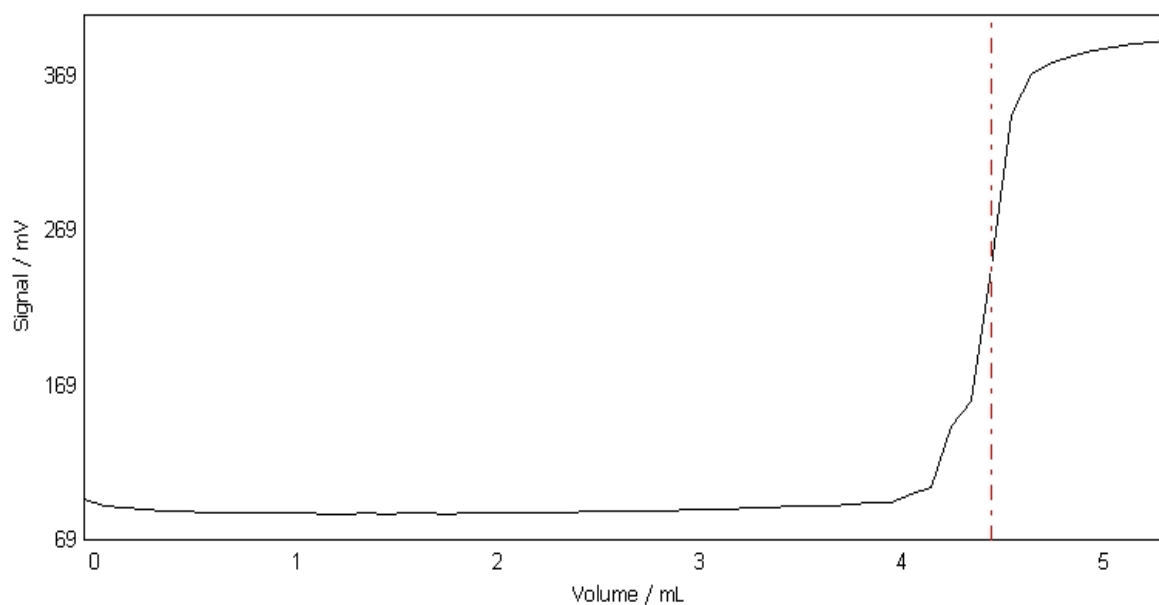
Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Sample 5/6

Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
0.0000	NaN	95.5	NaN	NaN	0	25.0
0.1000	0.1000	91.2	-4.3	NaN	16	25.0
0.2000	0.1000	89.6	-1.6	NaN	21	25.0
0.3000	0.1000	88.5	-1.1	NaN	26	25.0
0.4000	0.1000	87.8	-0.7	NaN	31	25.0
0.5000	0.1000	87.3	-0.5	-3.01	36	25.0
0.6000	0.1000	86.8	-0.5	-3.02	41	25.0
0.7000	0.1000	86.6	-0.2	-2.28	46	25.0
0.8000	0.1000	86.5	-0.1	-1.77	51	25.0
0.9000	0.1000	86.2	-0.3	-1.55	56	25.0
1.0000	0.1000	86.1	-0.1	-1.17	61	25.0
1.1000	0.1000	86.0	-0.1	-0.96	66	25.0
1.2000	0.1000	85.9	-0.1	-0.46	71	25.0
1.3000	0.1000	85.8	-0.1	0.09	76	25.0
1.4000	0.1000	86.0	0.2	0.04	81	25.0
1.5000	0.1000	85.9	-0.1	0.19	86	25.0
1.6000	0.1000	86.0	0.1	0.31	91	25.0
1.7000	0.1000	86.0	0.0	0.60	96	25.0
1.8000	0.1000	85.9	-0.1	0.73	101	25.0
1.9000	0.1000	86.2	0.3	1.17	106	25.0
2.0000	0.1000	86.3	0.1	1.40	111	25.0
2.1000	0.1000	86.5	0.2	1.71	116	25.0
2.2000	0.1000	86.5	0.0	1.76	121	25.0
2.3000	0.1000	86.8	0.3	1.80	126	25.0
2.4000	0.1000	87.0	0.2	2.16	131	25.0
2.5000	0.1000	87.2	0.2	2.25	136	25.0
2.6000	0.1000	87.4	0.2	2.20	141	25.0
2.7000	0.1000	87.7	0.3	2.30	146	25.0
2.8000	0.1000	87.9	0.2	2.53	151	25.0
2.9000	0.1000	88.1	0.2	2.90	156	25.0
3.0000	0.1000	88.4	0.3	3.10	161	25.0
3.1000	0.1000	88.9	0.5	3.49	166	25.0
3.2000	0.1000	89.1	0.2	3.91	172	25.0
3.3000	0.1000	89.6	0.5	4.04	176	25.0
3.4000	0.1000	89.9	0.3	4.35	182	25.0
3.5000	0.1000	90.5	0.6	4.75	186	25.0
3.6000	0.1000	90.9	0.4	2.34	192	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

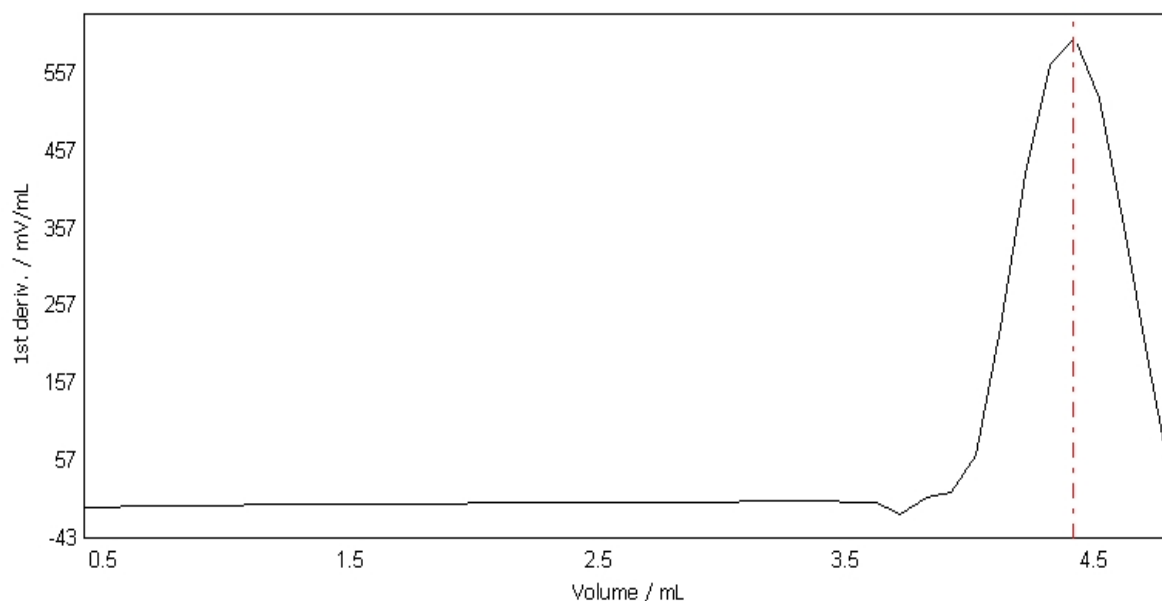
	Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
EQP1	3.7000	0.1000	91.4	0.5	3.25	197	25.0
	3.8000	0.1000	92.1	0.7	-11.89	202	25.0
	3.9000	0.1000	92.6	0.5	10.19	207	25.0
	4.0000	0.1000	93.2	0.6	15.72	212	25.0
	4.1000	0.1000	98.8	5.6	64.27	217	25.0
	4.2000	0.1000	103.1	4.3	228.82	222	25.0
	4.3000	0.1000	142.7	39.6	425.91	227	25.0
	4.4000	0.1000	158.7	16.0	567.36	232	25.0
	4.496499	NaN	242.5	NaN	603.24	NaN	NaN
	4.5000	0.1000	245.5	86.8	602.48	237	25.0
	4.6000	0.1000	343.5	98.0	524.64	242	25.0
	4.7000	0.1000	369.4	25.9	359.21	247	25.0
	4.8000	0.1000	377.2	7.8	181.37	252	25.0
	4.9000	0.1000	381.7	4.5	16.59	257	25.0
	5.0000	0.1000	385.1	3.4	NaN	262	25.0
	5.1000	0.1000	387.3	2.2	NaN	267	25.0
	5.2000	0.1000	389.5	2.2	NaN	272	25.0
	5.3000	0.1000	391.0	1.5	NaN	277	25.0
	5.4000	0.1000	392.2	1.2	NaN	282	25.0

E - V curve EQP titration [2]
Sample 5/6



Method: Iodine **Iodine Titer with EQP** **8/15/2012 1:52:42 PM**
Start time: 8/15/2012 2:24:16 PM

dE/dV - V curve **EQP titration [2]**
Sample 5/6



Raw data

Sample

No. 6/6
Standard As₂O₃
Type of standard solid
Comment
Titration stand Rondo60/1A
Weight m = 0.02296 g
Correction factor f = 1.0
Purity p = 100.00 %
Temperature T = 25.0 oC
Sample start 8/15/2012 3:17:38 PM
Sample end 8/15/2012 3:27:48 PM

EP titration [1]

Titrant HCl c = 2.0 mol/L TITER = 1.000
Sensor DG111-SC
Start potential EST = 13.226 pH
Consumption EP VEQ1 = 3.691481 mL
Q1 = 7.382963 mmol
EEQ1 = 6.500 pH
Excess VEX = 0.004518 mL
QEX = 0.009035 mmol
End VEND = 3.695999 mL
QEND = 7.391998 mmol
Termination at EP
Time t = 0:46 min

EQP titration [2]

Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Start potential EST = 97.8 mV
Predispense EPD = 97.5 mV
VPD = 0.0000 mL

Method:	Iodine	Iodine Titer with EQP	8/15/2012 1:52:42 PM
Start time:	8/15/2012 2:24:16 PM		

No. of EQPs and cand.		nEQ = 1
Consumption	EQP1	VEQ1 = 4.672051 mL Q1 = 0.468004 mmol EEQ1 = 245.0 mV EHN1 = 92.7 mV
Excess		VEX = 0.927949 mL QEX = 0.092954 mmol
End		VEND = 5.6000 mL QEND = 0.560958 mmol
Termination at Time	EQPs t = 5:07 min	

Calculation

Result	R1 = 0.99360 -- Titer
Formula	$R1 = m / (VEQ[2] * c[2] * C)$
Constant	$M / (10 * p * z)$ C = 0.04946
Molar mass	M[As2O3] = 197.84 g/mol
Equivalent number	z[As2O3] = 4
Duration	tUSE = 09:34 min

Measured values EP titration [1]

Titrant	HCl c = 2.0 mol/L TITER = 1.000
Sensor	DG111-SC
Sample	6/6

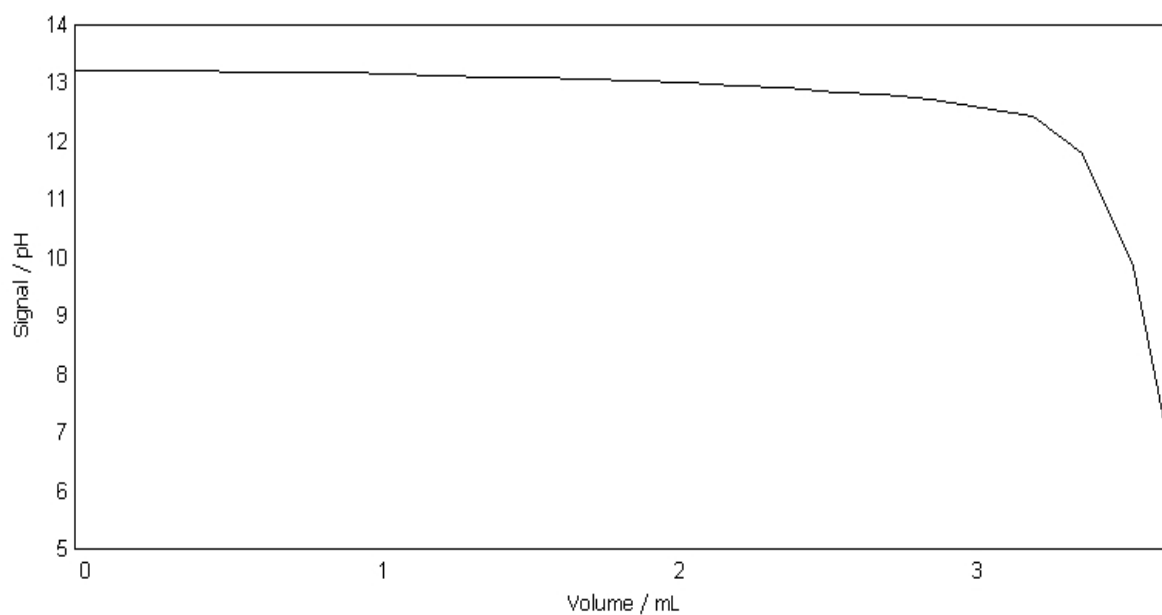
Volume mL	Increment mL	Signal pH	Change pH	Time s	Temperature oC
0.0000	NaN	13.226	NaN	0	25.0
0.0005	0.0005	13.220	-0.006	1	25.0
0.0020	0.0015	13.220	0.000	2	25.0
0.0050	0.0030	13.218	-0.002	3	25.0
0.0090	0.0040	13.223	0.005	4	25.0
0.0150	0.0060	13.225	0.002	5	25.0
0.0255	0.0105	13.223	-0.002	6	25.0
0.0380	0.0125	13.222	-0.001	7	25.0
0.0585	0.0205	13.222	0.000	8	25.0
0.0860	0.0275	13.220	-0.002	9	25.0
0.1200	0.0340	13.214	-0.006	10	25.0
0.1630	0.0430	13.215	0.001	11	25.0
0.2160	0.0530	13.209	-0.006	12	25.0
0.2795	0.0635	13.209	0.000	13	25.0
0.3555	0.0760	13.208	-0.001	14	25.0
0.4345	0.0790	13.204	-0.004	15	25.0
0.5335	0.0990	13.198	-0.006	16	25.0
0.6475	0.1140	13.187	-0.011	17	25.0
0.7740	0.1265	13.179	-0.008	18	25.0
0.9130	0.1390	13.173	-0.006	19	25.0
1.0645	0.1515	13.152	-0.021	20	25.0
1.2280	0.1635	13.131	-0.021	21	25.0
1.3970	0.1690	13.111	-0.020	22	25.0
1.5485	0.1515	13.099	-0.012	23	25.0
1.7175	0.1690	13.073	-0.026	24	25.0
1.8860	0.1685	13.041	-0.032	25	25.0
2.0550	0.1690	13.006	-0.035	26	25.0
2.2240	0.1690	12.968	-0.038	27	25.0
2.3925	0.1685	12.923	-0.045	28	25.0
2.5625	0.1700	12.844	-0.079	29	25.0
2.7145	0.1520	12.800	-0.044	30	25.0
2.8835	0.1690	12.730	-0.070	31	25.0
3.0525	0.1690	12.585	-0.145	32	25.0
3.2215	0.1690	12.419	-0.166	33	25.0
3.3905	0.1690	11.799	-0.620	34	25.0
3.5595	0.1690	9.859	-1.940	35	25.0
3.6960	0.1365	6.385	-3.474	36	25.0

Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP

8/15/2012 1:52:42 PM

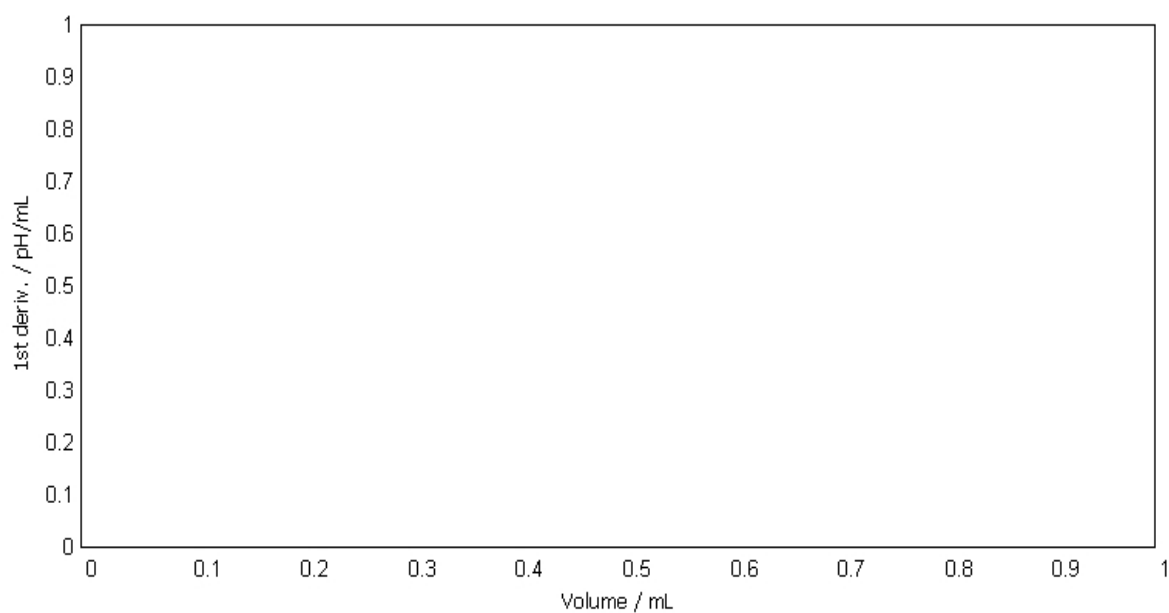
E - V curve EP titration [1]

Sample 6/6



dE/dV - V curve EP titration [1]

Sample 6/6



Measured values EQP titration [2]

Titrant 1/2 I₂ c = 0.1 mol/L TITER = 1.00171
Sensor DM140-SC
Sample 6/6

Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
0.0000	NaN	97.8	NaN	NaN	0	25.0
0.1000	0.1000	95.0	-2.8	NaN	16	25.0
0.2000	0.1000	94.2	-0.8	NaN	21	25.0
0.3000	0.1000	93.7	-0.5	NaN	26	25.0
0.4000	0.1000	93.4	-0.3	NaN	31	25.0

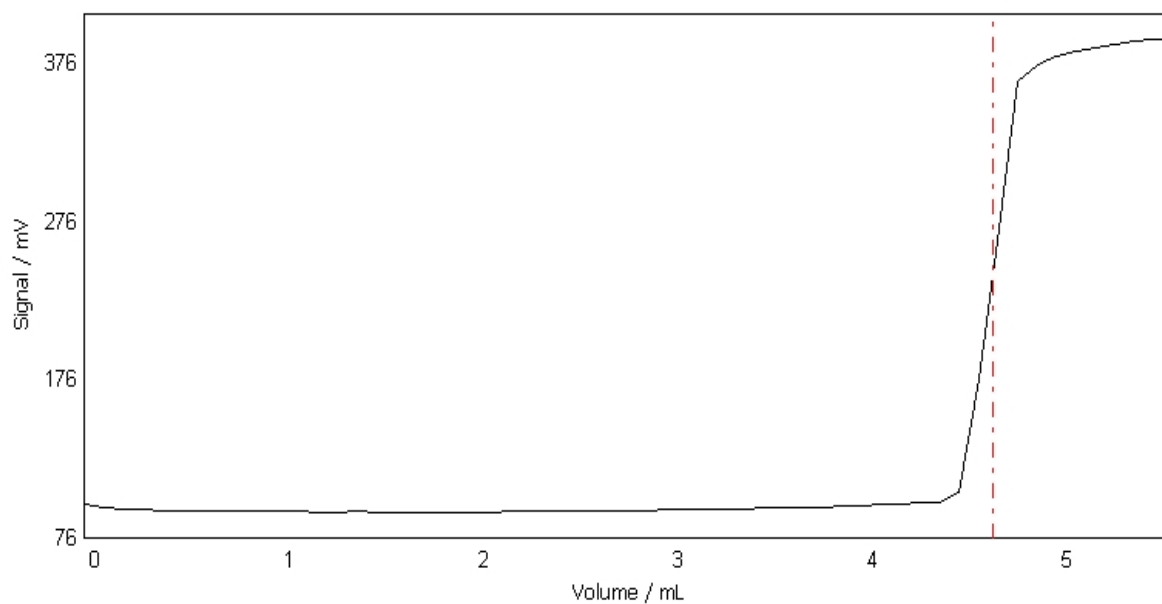
Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP
8/15/2012 1:52:42 PM

	Volume mL	Increment mL	Signal mV	Change mV	1st deriv. mV/mL	Time s	Temperature oC
	0.5000	0.1000	93.2	-0.2	-0.18	36	25.0
	0.6000	0.1000	93.1	-0.1	-0.44	41	25.0
	0.7000	0.1000	93.0	-0.1	-0.24	46	25.0
	0.8000	0.1000	93.2	0.2	-0.53	51	25.0
	0.9000	0.1000	93.0	-0.2	-1.02	56	25.0
	1.0000	0.1000	92.9	-0.1	-1.19	61	25.0
	1.1000	0.1000	92.7	-0.2	-1.22	66	25.0
	1.2000	0.1000	92.5	-0.2	-1.25	71	25.0
	1.3000	0.1000	92.5	0.0	-0.62	76	25.0
	1.4000	0.1000	92.6	0.1	-0.39	81	25.0
	1.5000	0.1000	92.4	-0.2	-0.37	86	25.0
	1.6000	0.1000	92.3	-0.1	-0.27	91	25.0
	1.7000	0.1000	92.5	0.2	-0.37	96	25.0
	1.8000	0.1000	92.3	-0.2	0.08	101	25.0
	1.9000	0.1000	92.3	0.0	0.43	106	25.0
	2.0000	0.1000	92.5	0.2	0.49	111	25.0
	2.1000	0.1000	92.4	-0.1	0.74	116	25.0
	2.2000	0.1000	92.7	0.3	1.12	121	25.0
	2.3000	0.1000	92.6	-0.1	1.19	126	25.0
	2.4000	0.1000	92.8	0.2	1.37	131	25.0
	2.5000	0.1000	93.0	0.2	1.51	136	25.0
	2.6000	0.1000	93.1	0.1	1.33	141	25.0
	2.7000	0.1000	93.3	0.2	1.52	146	25.0
	2.8000	0.1000	93.4	0.1	1.49	151	25.0
	2.9000	0.1000	93.5	0.1	1.74	156	25.0
	3.0000	0.1000	93.7	0.2	2.01	161	25.0
	3.1000	0.1000	94.0	0.3	1.98	166	25.0
	3.2000	0.1000	94.2	0.2	2.31	172	25.0
	3.3000	0.1000	94.4	0.2	2.41	176	25.0
	3.4000	0.1000	94.6	0.2	2.32	182	25.0
	3.5000	0.1000	94.8	0.2	2.55	187	25.0
	3.6000	0.1000	95.3	0.5	2.90	192	25.0
	3.7000	0.1000	95.4	0.1	3.12	197	25.0
	3.8000	0.1000	95.7	0.3	3.07	202	25.0
	3.9000	0.1000	96.2	0.5	3.65	207	25.0
	4.0000	0.1000	96.5	0.3	1.22	212	25.0
	4.1000	0.1000	96.9	0.4	-36.04	217	25.0
	4.2000	0.1000	97.4	0.5	-43.79	222	25.0
	4.3000	0.1000	98.4	1.0	35.43	227	25.0
	4.4000	0.1000	98.9	0.5	252.68	232	25.0
	4.5000	0.1000	105.1	6.2	483.25	237	25.0
	4.6000	0.1000	176.9	71.8	634.74	242	25.0
EQP1	4.672051	NaN	245.0	NaN	657.76	NaN	NaN
	4.7000	0.1000	271.4	94.5	655.90	247	25.0
	4.8000	0.1000	364.4	93.0	540.11	252	25.0
	4.9000	0.1000	374.5	10.1	326.27	257	25.0
	5.0000	0.1000	379.8	5.3	101.47	262	25.0
	5.1000	0.1000	383.3	3.5	-14.01	267	25.0
	5.2000	0.1000	385.9	2.6	NaN	272	25.0
	5.3000	0.1000	388.1	2.2	NaN	277	25.0
	5.4000	0.1000	389.8	1.7	NaN	282	25.0
	5.5000	0.1000	391.3	1.5	NaN	287	25.0
	5.6000	0.1000	392.3	1.0	NaN	292	25.0

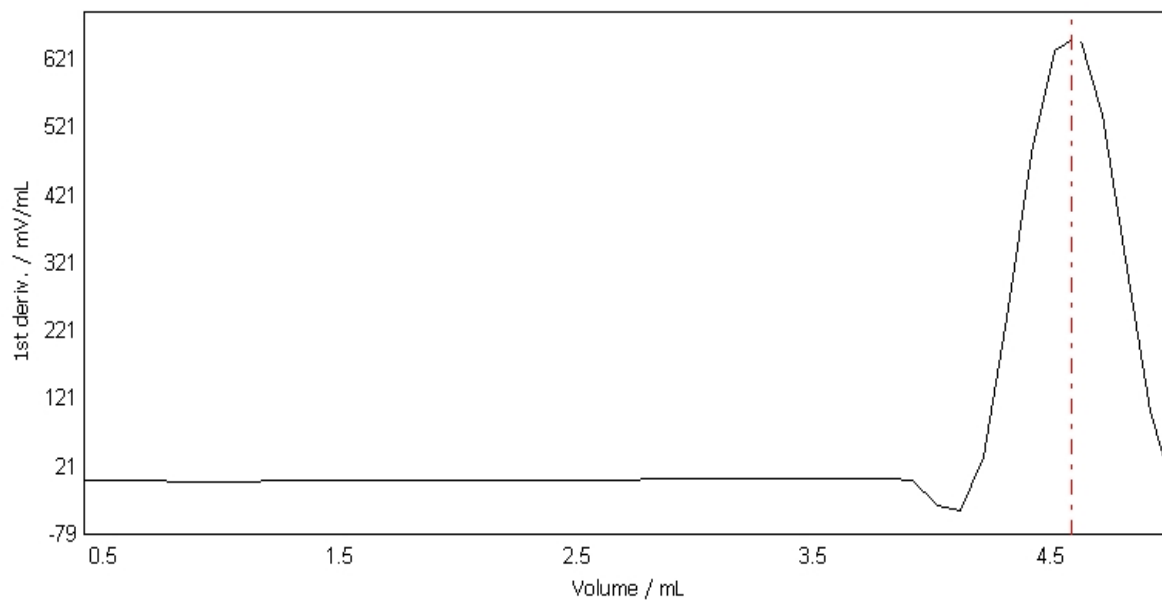
Method: Iodine
Start time: 8/15/2012 2:24:16 PM
Iodine Titer with EQP

8/15/2012 1:52:42 PM

E - V curve EQP titration [2]
Sample 6/6



dE/dV - V curve EQP titration [2]
Sample 6/6



Raw data

Calculation

Result	R2 = 0.994 -- Mean Titer
Formula	R2=Mean[R1]
Constant	1
	C = 1
Molar mass	M[None] = 1 g/mol
Equivalent number	z[None] = 1

Method:	Iodine	Iodine Titer with EQP	8/15/2012 1:52:42 PM
Start time:	8/15/2012 2:24:16 PM		

Titer

Titrant	1/2 I ₂ c = 0.1 mol/L
Titer	0.99356

-
- (1) Modified
 - (2) Excluded
 - (3) Outside limits
 - (4) Resource expired
 - (5) srel above max srel
 - (6) srel above max srel for multiple determination
 - (7) Value outside limits, not saved in setup
 - (8) Sample data outside limits
 - (9) Standard evaluation used
 - (10) Result from buffer

Created: **Development Administrator (admin), 8/15/2012 2:33:45 PM**