THE HYDROGEN ION RESPONSE OF THE GLASS ELECTRODE IN ALKALINE SOLUTIONS

by

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Appendix of Results

November 1970

INTRODUCTION

The results for each electrode are given in chronological order and thus provide a detailed record of electrode usage. In every case this is summarised in an 'electrode history' which precedes the tables of data. When more than one series of experiments was carried out for a particular electrode on the same day, the different series are presented in separate tables. These tables are numbered and are arranged in the order in which the results were obtained. In each table the experiments are presented in the order in which they were carried out. The various solutions are indicated using abbreviations similar to those used earlier (see page 109).

Electrode Histories

1. In these summaries, experiments involving solutions in which all glass electrodes are error-free within their performance precision, have not been listed. However it may be seen from the tables of results that at least one, and usually two of the following solutions were included in each experiment run.

H_2SO_4 - 0.1m and/ or 1.0m

HBr - 0.1m

Tris Buffer
Ethanolamine Buffer
} Usually with 0.1m hydrochloride

Acetate Buffer + NaCl

2. If an electrode was tested in more than one solution of a particular type (eg. alkaline sodium or lithium solutions) during an experimental run or series of runs, then only the one which caused the largest error has been listed.

3. Some solutions cause only certain glass electrodes to show errors. For example, only soda glass electrodes show errors in concentrated solutions of HCl and HBr. All experiments with these solutions have been indicated in the electrode histories irrespective of whether the electrode in question gave an error in the solution or not.

Basic Procedure for Tabulation of Data

This will be explained with reference to the first table, namely that giving the results obtained for electrode No. 1 on 2/6/64. This table gives the results of two tests in tris buffers with added NaCl using 0.1m HCl as standard solution.

1. The first three columns give the results of the first of the experiments. The electrode was transferred from 0.1m HCl, in which it was placed initially, to tris + 0.5m NaCl, and the data for this test solution are given in the second column. The electrode was then transferred back to the HCl and the time-dependence of the e.m.f. for this solution is presented in the third column.

2. The data for both solutions are given as the errors shown by the electrode relative to the final e.m.f. observed for the standard solution immediately before the electrode was transferred to the test solution.

3. Columns 1, 4 and 5 of the table give the results of the second experiment in which the procedure was similar to the first, the electrode being transferred directly to the tris buffer with added NaCl at the end of the 15 minutes in the 0.1m HCl which concluded the first experiment.

4. The results for this second experiment, both for the test solution and the standard solution, are given as errors relative to the final e.m.f. observed for the second period in 0.1m HCl corresponding to the foot of column 3. Hence at this point the HCl served both as standard solution 2 for the first experiment and standard solution 1 for the second.

5. As in earlier tables, when a value is given with a number in brackets beside it, this number is the time in minutes to which the value refers. The number in brackets alongside the 'final' value for a solution, is therefore the total time for which the electrode was placed in that solution.

6. In some instances it will be observed that values have not been recorded for all the times listed in the table at which the glass electrode remained in the solution in question. This was because at these times, either measurements were being made with another electrode or the measuring circuit was being standardised.

Extensions of Basic Procedure

1. In several tables more than one solution is given at the top of a column of data. In such cases, the results for the solutions listed have been treated together, as if the glass electrode had been placed in

the same solution for the whole period.

2. With very few exceptions this procedure has only been applied to standard solutions. It was adopted for two reasons:

a) In some experiments when the glass electrode was transferred from the test solution back to a standard solution, a transient was observed, and the electrode was transferred to another standard solution before this transient had completely died away.

b) It was thought to be unnecessary to give full details of all transfers between standard solutions. Typical results for transfers of the various glass electrodes between standard solutions have been given in section 6.1, and some additional examples are to be found in this Appendix. However, a given glass electrode shows similar response in all transfers between two standard solutions and hence to tabulate all such results would not provide any significant additional information.

3. With this modified procedure of presenting the data, zero time has been taken at the moment of making the initial e.m.f. reading for the first solution listed at the top of the column.

4. The data are presented as the errors calculated relative to the final e.m.f. observed with the glass electrode placed in the last solution of the previous 'standard' column.

5. The modified procedure used when the data for two or more solutions are considered together in this way will now be explained with reference to experiments with electrode No. 8.

Example 1 — Table 11/5/65 (1)

Column 4 is headed:- 0.1m Cl^-/T
p_wH 8.63
(9 min.)

0.1m H_2SO_4

Here the electrode was transferred to the 0.1m H_2SO_4 9 minutes after being placed in the tris buffer. The final value was obtained 16 minutes after transfer to the tris buffer and hence the electrode was placed in the sulphuric acid for 7 minutes.

Example 2 — Table 17/5/65

Column 4 is headed:- 0.1mCl^-/T
p_wH 8.64

Except:-
0.1m HBr
(9-17 min.)

In this case the electrode was transferred to the 0.1m HBr 9 minutes after it was first placed in the tris buffer but was transferred back to the tris after a further 8 minutes. The final value was observed 24 minutes after the electrode was first placed in the tris buffer and hence when the electrode was transferred back to this solution it remained there for 7 minutes.

Column 6:- (Test 102)	0.1m Br^-/E 1.0m KBr p_wH 10.01 (9 min.)	Column 3:- (Test 101)	0.1mBr^-/E 1.0m KBr p_wH 10.01
	0.1m Cl^-/E 1.0m KCl p_wH 10.09		Except:- 0.1m Cl^-/E 1.0m KCl p_wH 10.09 (7-16 min.)

Here the procedures used for standard solutions illustrated above by examples 1 and 2 respectivaly, are applied to two solutions in which this glass electrode showed an error. The principal difference between these solutions was that they contained different anions. In other respects they were identical except for a slight difference in p_wH, and the electrode gave the same error in both.

Electrode No. 1. E.I.L. GG 33.

				E_7
5/6/63	Mounted and placed in deionised water.			
14/6/63 to 18/3/64	HCl	0.1m		0.394 to 0.408
	Tris Buffers			
	$MgCl_2$	1.1m	p_wH 9.11	
	$MgSO_4$	1.7m	p_wH 9.02	
17/4/64*	HCl	0.1m		0.408
	Sodium Solution	1.0m	p_wH 8.12	
	Lithium Solution	1.0m	p_wH 9.12	
2/6/64 to 18/6/64	HCl	0.1m		0.403
	Sodium Solution	1.0m	p_wH 8.83	
		2.0m	p_wH 8.46	
9/7/64 and 10/7/64	HCl	0.1m + 1.0m NaCl		0.404
	Sodium Solution	1.0m	p_wH 8.43	
17/5/65	HCl	0.5m		0.408
	Sodium Solution	1.0m	p_wH 8.83	
1/6/65 and 13/6/65	Potassium Solution	1.0m	p_wH 10.54	0.409
		2.0m	p_wH 10.65	
29/7/65 and 4/8/65	HCl	1.0m		0.411
	Sodium Solution	1.0m	p_wH 10.49	
10/12/65 and 17/12/65	HBr	11.0m		0.413
	HCl	0.5m		
	Lithium Solution	1.0m	p_wH 10.74	
	Potassium Solution	1.0m	p_wH 9.04	
14/4/66	HCl	1.0m		0.417
5/5/66	Sodium Solution	1.0m	p_wH 10.55	0.417
Resistance	190 Megohms.			

* Preliminary experiments - results not tabulated.

Electrode No. 1 2/6/64 Initial Standard Solution

0.1m HCl

Solution	Test 249 0.1m Cl^-/T 0.5m NaCl p_wH 8.78	Standard 0.1m HCl	Test 250 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m HCl
Time (min.)				
0	+4.6	-2.8	+7.3	-2.6
1	+2.5	-1.2	+4.0	-1.4
2	+2.1	-0.7	+3.3	-0.8
5	+1.8	-0.4	+2.8	-0.3
10	+1.7	-0.2	+2.6	-0.1
15	+1.6	-0.2		0.0
20				0.0
Final	+1.6 (15)	-0.2 (15)	+2.6 (14)	0.0 (21)

Electrode No. 1 | 11/6/64 | Initial Standerd Solution 0.1m HCl

Solution	Standard 0.1mCl^-/T p_wH 8.21	Test 255 0.1mCl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl (35 min.) 0.1mCl^-/T p_wH 8.21	Test 256 0.1mCl^-/T 2.0mNaCl p_wH 8.46	Standard 0.1mCl^-/T p_wH 8.21
Time (min.)					
0	+0.5	+2.0	-2.2	+4.2	-2.1
1	0.0	+1.5	-0.9	+3.4	-1.3
2	0.0	+1.5	-0.6	+3.0	-0.9
5		+1.4	-0.3	+2.6	-0.5
10			-0.3	+2.4	-0.3
15					-0.2
20					
25					
30			-0.3		
35			-0.3		
40			-0.1		
Final	0.0 (4)	+1.4 (6)	-0.1 (42)	+2.4 (14)	-0.2(15)

This was the last date upon which this electrode was error-free in 0.1m HCl. However in a few subsequent experimental runs the electrode was tested using 0.1m HCl as a standard solution. For the purpose of tabulation, the data for these tests has been treated as if 0.1m NCl were a standard solution but the word "standard" has been omitted from the columns.

Electrode No. 1 16/6/64 Initial Standard Solution 0.1m HCl

Solution	Test 267 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl	Test 268 0.1m Cl^-/T 2.0m NaCl p_wH 8.46	0.1m HCl
Time (min.)				
0	+3.0	-2.2	+6.0	-2.8
1	+1.9	-0.7	+3.0	-1.2
2	+1.8	-0.4	+2.6	-0.7
5	+1.7	-0.2	+2.3	-0.3
10	+1.6	-0.1	+2.2	-0.2
15				-0.1
Final	+1.6 (10)	-0.1 (11)	+2.2 (14)	-0.1 (16)

Electrode No. 1 — 18/6/64 (1) — Initial Solution 0.1m HCl

Solution	Test 271 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl	Test 272 0.1m Cl^-/T 2.0m NaCl p_wH 8.46	0.1m HCl
Time (min.)				
0	+5.3	-2.4	+7.2	-3.6
1	+3.2	-1.3	+5.0	-2.1
2	+2.7	-0.9	+4.2	-1.5
5	+2.1	-0.5	+3.3	-0.7
10	+1.8	-0.3	+3.0	-0.3
15	+1.8	-0.2	+2.8	-0.1
20			+2.8	
Final	+1.8 (16)	-0.2 (16)	+2.7 (24)	-0.1 (18)

Electrode No. 1 | 18/6/64 (2) | Initial Solution 0.1m HCl (Test 346)

Solution	Standard $0.1m Cl^-/T$ p_wH 8.21	Test 282 $0.1m Cl^-/T$ 1.0m NaCl p_wH 8.43	Standard $0.1m Cl^-/T$ p_wH 8.21	Test 283 $0.1m Cl^-/T$ 1.0m NaCl p_wH 8.43
Time (min.)				
0	+0.8	+2.0	-1.5	+1.9
1	+0.3	+2.0	-0.6	+1.9
2	+0.3	+1.9	-0.5	+1.9
5	+0.3	+1.7	-0.3	+1.8
10		+1.5		
15				
Final	+0.3 (6)	+1.5 (11)	-0.3 (8)	+1.8 (7)

Electrode No. 1 9/7/64 Initial Solution 0.1m HCl

Solution	Test 284 0.1m HCl 1.0m NaCl	0.1m HCl	Test 285 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	286 0.1m HCl	Standard 0.1m Cl^-/T p_wH 8.23
Time (min.)					
0	-2.6	+2.0	+5.4	-2.6	+0.7
1	-1.3	+0.1	+3.1	-1.4	+0.4
2	-1.1	0.0	+2.5	-0.8	+0.4
5	-1.0	-0.1	+2.0	-0.3	+0.4
10			+1.7	-0.1	
15			+1.6		
20			+1.6		
Final	-1.0 (7)	-0.1 (8)	+1.6 (20)	-0.1 (14)	+0.4 (9)

Electrode No. 1 9/7/64 (Cont.)

Solution	286 0.1m HCl	Test 287 0.1m HCl 1.0m NaCl	Test 288 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl
Time (min.)				
0	-1.6	-2.6	+7.4	-3.6
1	-0.5	-1.2	+4.7	-2.2
2	-0.4	-1.0	+3.7	-1.5
5	-0.3	-0.9	+2.6	-0.7
10			+2.2	-0.3
15			+2.0	-0.1
20			+1.9	
Final	-0.3 (9)	-0.9 (8)	+1.9 (24)	-0.1 (15)

Electrode No. 1 10/7/64 Initial Solution 0,1m HCl

Solution	Test 312 0.1m HCl 1.0m NaCl	313 0.1m HCl	Standard 0.1m Cl^-/T p_wH 8.23	Test 314 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m Cl^-/T p_wH 8.23
Time (min)					
0	-2.8	+1.7	+0.8	+2.8	-1.6
1	-1.3	+0.2	+0.4	+3.0	-1.1
2	-1.1	+0.1	+0.4	+2.7	-0.8
5	-1.0	0.0	+0.4	+2.2	-0.5
10			+0.4	+1.7	-0.4
15				+1.6	
20				+1.5	
Final	-1.0 (8)	0.0 (7)	+0.4 (10)	+1.5 (21)	-0.3 (12)

Electrode No. 1 10/7/64 (Cont.)

Solution	315	Test 316	
	0.1m HCl	0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl
Time (min.)			
0	-1.7	+5.1	-2.2
1	-0.7	+3.7	-1.4
2	-0.6	+3.3	-1.1
5	-0.4	+2.7	-0.6
10		+2.4	-0.2
15		+2.3	
20		+2.3	
Final	-0.4 (7)	+2.3 (21)	-0.2 (12)

Electrode No. 1 — 17/5/65 — Initial Standard Solution 0.1m HBr

Solution	Standard $0.1mCl^-/T$ p_wH 8.64	Test 84 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1mCl^-/T$ p_wH 8.64 Except:- 0.1m HBr (8-15 min.)	Test 85 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1mCl^-/T$ (8 min.) 0.1m HBr
Time (min.)					
0	-0.1	+2.3	-0.8	+1.9	-1.2
1	0.0	+2.0	-0.2	+1.8	-0.3
2	+0.1	+2.0	0.0	+1.9	-0.1
5	+0.1	+2.1	0.0	+2.0	-0.1
10			-0.2	+2.1	-0.3
15			-0.2		-0.2
20			0.0		
25			0.0		
30			0.0		
Final	+0.1 (8)	+2.1 (9)	+0.1 (55)	+2.1 (10)	-0.2 (15)

Electrode No. 1 17/5/65 (Cont.)

Solution	Test 86 0.1m HCl	Standard 0.1m HBr	Test 87 0.5m HCl	Standard 0.1m HBr	Test 88 0.5m HCl
Time (min.)					
0	-1.1	-0.5	-3.4	+2.3	-3.2
1	-0.5	-0.1	-3.9	+0.6	-4.2
2	-0.5	0.0	-3.9	+0.3	-4.3
5	-0.5	0.0	-3.8	0.0	-3.9
10				-0.1	-3.7
15				-0.1	
20					
Final	-0.5 (7)	0.0 (7)	-3.8 (9)	0.0 (45)	-3.7 (14)

Electrode No. 1. 17/5/65 (Cont.)

Solution	Standard 0.1m HBr (16 min.) 0.1m Cl^-/T p_wH 8.64	Test 89 0.1m Cl^-/T 1m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.64
Time (min.)			
0	+2.3	+6.0	-3.2
1	+0.8	+5.8	-2.4
2	+0.4	+5.2	-1.9
5	+0.1	+4.1	-1.2
10	0.0	+3.4	-0.7
15	0.0	+3.2	-0.4
20	+0.1	+3.1	
Final	+0.1 (23)	+2.8 (50)	-0.3 (18)

Electrode No. 1 1/6/65 Initial Standard Solution: 0.1m Cl^-/E p_wH 9.24

Solution	Standard 0.1m Cl^-/E p_wH 9.75	Standard 0.1m Cl^-/E p_wH 10.45	Standard 0.1m Cl^-/E p_wH 9.75	Test 362 0.1m Cl^-/E 1.0m KCl p_wH 10.09	Standard 0.1m Cl^-/E p_wH 9.75
Time (min.)					
0	-0.2	-0.2	+0.1	+3.7	-0.3
1	-0.1	-0.3	+0.2	+3.0	+0.3
2	-0.1	-0.2	+0.2	+3.0	+0.5
5	-0.1	-0.2	+0.2	+3.0	+0.5
10				+3.0	
15				+3.1	
Final	-0.1 (8)	-0.2 (7)	+0.2 (7)	+3.1 (15)	+0.5 (8)

Electrode No. 1 13/7/65 (1) Initial Standard Solution

0.1m H_2SO_4

Solution	Test 116 0.1m Br^-/E 1.0m KBr p_wH 10.01	Standard 0.1m H_2SO_4	Test 117 0.1m Cl^-/E 1.0m KCl p_wH 10.54	Standard 0.1m H_2SO_4
Time (min.)				
0	+4.0	-0.4	+5.7	-0.6
1	+3.4	+0.2	+4.9	-0.2
2	+3.3	+0.3	+4.7	+0.1
5	+3.3	+0.3	+4.6	+0.2
10	+3.3			
Final	3.3 (8)	+0.3 (7)	+4.6 (9)	+0.2 (9)
Final	+3.3	+0.3 (8)		

Electrode No. 1 — 13/7/65 (2) — Initial Standard Solution 0.1m H_2SO_4

Solution	Test 118 0.1m Cl^-/E 2.0m KCl p_wH 10.65	Standard 0.1m H_2SO_4	Test 119 0.1m Cl^-/E 1.0m KCl p_wH 10.54
Time (min.)			
0	+9.3	-1.0	+5.9
1	+7.6	0.0	+4.9
2	+7.2	+0.2	+4.7
5	+6.9	+0.3	+4.5
10	+6.8		
Final	+6.8 (14)	+0.3 (9)	+4.4 (9)

Electrode No. 1 — 29/7/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.08	Test 123 0.1mCl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1mCl^-/E p_wH 10.08 (13 min.) 0.1m H_2SO_4	Test 124 0.5m HCl	Standard 0.1mH_2SO_4
Time (min.)					
0	+0.2	+13.5	+0.9	-9.5	+0.9
1	+0.2	+13.7	+0.9	-7.1	-0.6
2	+0.2	+14.0	+0.9	-6.4	-0.8
5	+0.2	+14.5	+0.7	-6.2	-0.9
10		+14.9	+0.6	-6.4	-0.9 (9)
15		+15.2	+0.1	-6.5	
20		+15.3	+0.1		
25		+15.5			
30					-0.4
35					-0.4
Final	+0.2 (7)	+15.5 (26)	+0.1 (22)	-6.6 (19)	-0.4 (39)

Electrode No. 1 29/7/65 (Cont.)

Solution	Standard 0.1m Cl^-/E p_wH 10.08 (8 min.) 0.1m H_2SO_4	Test 125 1.0m HCl	Standard 0.1m H_2SO_4 (12 min.) 0.1m Cl^-/E p_wH 10.08	Test 126 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 10.08
Time (min.)					
0	+0.2	-21.5	+2.7	+32.7	-11.5
1	+0.2	-15.9	+0.5	+32.3	-11.3
2	+0.2	-14.6	+0.1	+30.7	- 9.8
5	+0.2	-13.5	-0.2	+27.4	- 6.7
10	0.0	-13.1	-0.2	+25.2	- 4.1
15	0.0	-12.9	0.0	+24.2	- 2.8
20				+23.6	- 2.0
25				+23.1	- 1.4
30				+22.8	- 1.0
35				+22.5	- 0.8
40					- 0.6
45					- 0.4
50					- 0.3
70					0.0
Final	0.0 (16)	-12.9 (19)	0.0 (19)	+21.8 (60)	0.0 (75)

Electrode No. 1 4/8/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard	Test 132	Standard	Test 133	Standard
	0.1mCl^-/E p_wH 9.41	0.1mCl^-/E 1.0m NaCl p_wH 9.85	0.1mCl^-/E p_wH 9.41 (11 min.)	0.1mCl^-/E 1.0m NaCl p_wH 10.49	0.1mCl^-/E p_wH 10.08 (11 min.)
			0.1mCl^-/E p_wH 10.08		0.1mCl^-/T p_wH 8.91
Time (min.)					
0	-0.1	+7.0	+0.2	+14.9	+0.6
1	0.0	+7.3	+0.3	+15.4	+0.5
2	+0.1	+7.5	+0.3	+15.8	+0.4
5	0.0	+7.7	+0.2	+16.2	+0.2
10		+8.0	+0.1	+16.4	+0.2
15			+0.2	+16.5	+0.1
20			+0.2		
Final	0.0 (8)	+8.0 (11)	+0.2 (20)	+16.5 (16)	+0.2 (19)

Electrode No. 1 | 10/12/65 | Initial Standard Solution 0.1m Cl^-/E p_wH 10.11

Solution	Standard 0.1m Cl^-/T p_wH 8.76	Test 168 0.1m Cl^-/T 1.0m KCl p_wH 9.04	Standard 0.1m Cl^-/T p_wH 8.76 (7 min.) 0.1m Cl^-/E p_wH 10.11	Test 169 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m Cl^-/E p_wH 10.11
Time (min.)					
0	-0.3	+1.1	-0.3	+4.3	-1.0
1	-0.2	+0.9	+0.1	+4.0	0.0
2	-0.2	+1.0	+0.2	+4.0	+0.2
5	-0.2	+1.0	+0.2	+4.1	+0.3
10			+0.3	+4.3	
15			+0.3		
Final	-0.2 (8)	+1.0 (8)	+0.3 (15)	+4.3 (12)	+0.2 (8)

Electrode No. 1 — 10/12/65 (Cont.)

Solution	Test 170 0.5m HCl	Standard 0.1m Cl^-/T p_wH 8.76	Test 171 0.1m Cl^-/T 1.0m KCl p_wH 9.04
Time (min.)			
0	-11.0	+2.1	+3.2
1	-10.0	+0.5	+3.2
2	-8.6	+0.2	+3.3
5	-7.3	-0.3	+3.3
10	-6.8	-0.5	
15		-0.6	
	+6.6 (35)		
	+6.6 (40)		
Final	+6.6 (42)	-0.6 (15)	+3.2 (8)

Electrode No. 1 — 17/12/65 (1) — Initial Standard Solution 0.1m HBr

Solution	Standard 0.1m H_2SO_4 (7 min.) 0.1m Cl^-/T p_wH 8.76	Test 172 0.1m Cl^-/T 1.0m KCl p_wH 9.04	Standard 0.1m Cl^-/T p_wH 8.76
Time (min.)			
0	0.0	+1.6	+0.3
1	0.0	+1.4	+0.8
2	0.0	+1.4	+1.0
5	0.0	+1.4	+1.0
10	+0.1		
15	-0.1		
Final	-0.1 (17)	+2.1* (1½ hrs.)	+1.0 (9)

* Final e.m.f. constant to 0.1mV for 8 min.

Electrode No. 1 | 17/12/65 (2) | Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m HBr	Test 173 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m HBr	Test 174 11m HBr	Standard 0.1m HBr (17 min.) 0.1m H_2SO_4
Time (min.)					
0	+0.3	+6.4	-2.4	-188.7	+30±2
1	-0.1	+5.2	-1.3	-190.6	+1.5
2	0.0	+4.8	-1.0	-191.2	-1.6
5	0.0	+4.3	-0.5	-191.6	-2.4
10		+4.2	-0.1	+192.4	-2.2
15			-0.1	-193.1	-2.0
				-193.5 (18)	
20					-1.8
25					-1.7
Final	0.0 (7)	+4.2 (14)	-0.1 (15)	-197.0 (50)	-1.7 (26)

Electrode No. 1 17/12/65 (2) (Cont.)

Solution	Test 175 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m H_2SO_4 (22 min.) 0.1m HBr
Time (min.)		
0	+14.8	-8.5
1	+13.3	-4.9
2	+12.0	-3.5
5	+10.2	-1.7
10	+ 9.1	-0.5
15	+ 8.6	-0.1
20	+ 8.3	+0.1
25	+ 8.1	+0.1
30		+0.2
Final	+8.0 (29)	+0.2 (32)

Electrode No. 1 — 14/4/66 — Initial Standard Solution 0.1m H_2SO_4

Solution	Test 201 1m HCl	Standard 0.1m H_2SO_4	Test 202 1m HCl	Standard 0.1m H_2SO_4
Time (min.)				
0	-7.2	+6.5	-14.9	+9.8
1	-13.4	+1.6	-19.4	+1.9
2	-16.5	+0.6	-18.2	+0.8
5	-15.9	-0.1	-16.5	0.0
10	-15.4	-0.4	-15.9	-0.2
15	-15.2	-0.4	-15.7	
20	-15.3		-15.7	
25	-15.4			
30	-15.5			
Final	-15.5 (30)	-0.4 (17)	-15.7 (21)	-0.2 (14)

Electrode No. 1. 6/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.01	Test 377 0.1mCl^-/E 1.0m NaCl p_wH 10.55
Time (min.)		
0	+0.9	+15.7
1	+0.9	+16.1
2	+0.8	+16.6
5	+0.4	+17.2
10	+0.2	+17.6
15		+17.8
20		+18.0
Final	+0.2 (11)	+18.0 (20)

Electrode No. 3. Beckman E2

13/8/63 Mounted and placed in deionised water.

			E_7
10/10/63 to 8/4/64	HCl Tris Buffers	0.1m	-0.147 to -0.135
14/4/64 to 12/5/64	HCl Sodium Solution	0.1m 1.0m p_wH 9.16 2.0m p_wH 8.58	-0.135
15/7/64 to 24/7/64	HCl Sodium Solution Lithium Solution	0.1m + 1.0m NaCl 1.0m p_wH 8.43 1.0m p_wH 9.27	-0.130
25/11/65	Sodium Solution	1.0m p_wH 13.00	+0.603

Resistance 450 Megohms.

The reason for the change in calibration e.m.f. shown by this electrode is not known. However the electrode was observed to have a crack in its stem and it is possible that, during the year (7/64 to 11/65) when the electrode was not used, water passed through this crack to change the composition of the inner solution.

Electrode No. 3 — 25/11/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.11	Test 72 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E p_wH 10.11	Test 73 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m Cl^-/E p_wH 10.11 (12 min.) 0.1m H_2SO_4
Time (min.)					
0	0.0	+2.9	-0.8	+6.5	-2.3
1	0.0	+2.2	-0.1	+5.0	-0.5
2	+0.1	+2.0	+0.1	+4.6	0.0
5	+0.1	+1.7	+0.2	+4.2	+0.4
10		+1.6		+3.9	+0.5
15				+3.8	+0.6
				+3.5 (35)	
Final	+0.1 (7)	+1.6 (10)	+0.2 (8)	+3.4 (43)	+0.7 (19)

Electrode No. 3 25/11/65 (Cont.)

Solution	Standard 0.5m HCl (8 min.) 0.1m Cl^-/E p_wH 10.11
Time (min.)	
0	-0.2
1	0.0
2	+0.1
5	+0.1
10	+0.2
15	+0.2
Final	+0.2 (15)

Electrode No. 4. **Radiometer B.**

4/11/63	Mounted and placed in deionised water.			
				E_7
19/11/63 to 8/4/64	HCl Tris Buffers Ethanolamine Buffers	0.1m		0.623 to 0.624
15/7/64 to 6/8/64	HCl Sodium Solution Lithium Solution	0.1m + 1.0m NaCl 1.0m 1.0m	 p_wH 8.43 p_wH 9.27	0.625
18/8/64	HCl	0.1m		0.623
9/11/64	HCl	0.5m		0.627
17/5/65	HCl Sodium Solution	0.5m 1.0m	 p_wH 8.83	0.628
30/7/65 and 5/8/65	HCl Sodium Solution	1.0m 1.0m	 p_wH 10.49	0.629
19/8/65	Lithium Solution	1.0m	p_wH 10.59	0.628
22/11/65	Sodium Solution	1.0m	p_wH 13.00	0.631
9/8/66	Sodium Solution Fluoride Solution	1.0m 0.1m	p_wH 9.16 approx. p_wH 4.8	0.632
10/8/66	Sodium Solution	1.0m	p_wH 9.16	0.628

Resistance 520 Megohms.

Electrode No. 4. 19/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.52	Standard 0.1m H_2SO_4	Test 378 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m H_2SO_4	Standard 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 9.56
Time (min.)					
0	-1.4	+2.6	+1.4	+2.2	+1.7
1	-0.3	+0.2	+0.5	+0.1	+0.2
2	-0.1	+0.1	+0.5	0.0	+0.2
5	0.0	0.0	+0.5	0.0	+0.2
10	+0.2	-0.1	+0.5	+0.1	
Final	+0.2 (10)	-0.1 (12)	+0.5 (10)	+0.1 (12)	+0.2 (8)

Electrode No. 4 — 22/11/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.11	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Standard 0.1m Cl^-/E p_wH 10.11	Test 12 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E p_wH 10.11
Time (min.)					
0	+2.2	+2.2	-0.4	+3.5	-1.7
1	0.0	+0.2	-0.3	+2.1	-0.4
2	-0.1	+0.1	-0.2	+1.9	-0.3
5	-0.2	0.0	-0.3	+1.6	-0.2
10				+1.5	
15					
Final	-0.3 (8)	-0.1 (8)	-0.3 (8)	+1.5 (13)	-0.2 (8)

Electrode No. 4 22/11/65 (Cont.)

Solution	Test 13 0.1m NaOH 0.9m NaCl p_wH 13.00	Solution 0.1m Cl^-/E p_wH 10.11
Time (min.)		
0	+6.2	-2.7
1	+5.4	-0.6
2	+4.9	-0.3
5	+4.3	0.0
10	+3.9	+0.1
15	+3.7	+0.2
20	+3.5	
Final	+3.5 (21)	+0.2 (16)

Electrode No. 4 9/8/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.29	Standard Borax 1.0m Na^+ p_wH 9.16	Standard 0.1m Cl^-/E p_wH 10.29	Standard 0.1m H_2SO_4	Test 350* Acetate 0.1m F^- Approx. p_wH 4.8
Time (min.)					
0	-4.3	+0.9	-3.4	-1.3	-0.4
1	-0.2	0.0	-0.3	-0.2	-0.8
2	0.0	0.0	-0.1	-0.1	-1.7
5	0.0	0.0	-0.1	-0.1	-2.4
10					-9.6
Final	+0.1 (9)	0.0 (8)	-0.1 (9)	-0.1 (7)	-15.7 (13)

* On account of the instability of the potential of the hydrogen electrode for this solution these are observed rather than true values. They have been included to illustrate the time variation of the glass electrode potential. (See Chapter 9).

Electrode No. 4 9/8/66 (Cont.)

Solution	Standard $0.1mCl^-/E$ p_wH 10.29	Standard $0.1m\ H_2SO_4$
Time (min.)		
0	-11.6	-4.5
1	-10.4	-2.9
2	-10.0	-2.8
5	- 9.4	-2.3
10	- 8.9	-1.7
15		-1.3
20	- 8.2	-1.0
25	- 8.1	
Final	-9.0 (28)	-0.9 (23)

Electrode No. 5. E.I.L. GG 33

3/3/64 Mounted and placed in deionised water.

E_7

9/3/64* to 12/5/64	HCl	0.1m		0.390 to 0.393
	Lithium Solution	1.0m	p_wH 9.15	
	Sodium Solution	1.0m	p_wH 9.16	
		2.0m	p_wH 8.58	
28/5/64 to 10/7/64	HCl	0.1m + 1.0m NaCl		0.393
	Sodium Solution	1.0m	p_wH 8.83	
		2.0m	p_wH 8.46	
18/8/64 and 5/11/64	HCl	0.1m and 0.5m		0.394
11/5/65	HCl	0.5m		0.396
	Sodium Solution	1.0m	p_wH 8.83	
18/6/65 and 13/7/65	Potassium Solution	1.0m	p_wH 10.56	0.398
		2.0m	p_wH 10.65	
29/7/65 to 24/8/65	HCl	1.0m		0.399
	Sodium Solution	1.0m	p_wH 10.49	
	Lithium Solution	1.0m	p_wH 10.59	
21/12/65	HBr	5.0m		0.404
	Sodium Solution	1.0m	p_wH 9.84	
	Lithium Solution	1.0m	p_wH 10.74	
19/4/66	HCl	1.0m		0.407
6/5/66	Sodium Solution	1.0m	p_wH 10.55	0.408
3/8/66	Fluoride Solution	0.1m	approx. p_wH 4.8	0.411
17/8/66	Potassium Solution	1.0m	p_wH 10.05	0.411

Resistance 90 Megohms.

* Preliminary experiments - results not tabulated.

Electrode No. 5 | 28/5/64 | Initial Standard Solution 0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.62	Standard 0.1m HCl	Test 245 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m HCl
Time (min.)				
0	+0.2	-2.3	+6.4	-3.2
1	+0.3	-0.4	+4.4	-2.1
2	+0.2	-0.3	+3.8	-1.6
5	+0.2	-0.3	+2.9	-1.1
10			+2.5	-0.7
15			+2.3	-0.5
20			+2.2	-0.5
Final	+0.2 (5)	-0.3 (6)	+2.1 (23)	-0.5 (20)

Electmde No. 5 2/6/64 Initial Standard Solution
0.1m HCl

Solution	Standard $0.1mCl^-/T$ p_wH 8.62	Test 251 $0.1mCl^-/T$ 0.5m NaCl p_wH 8.78	Standard $0.1mCl^-/T$ p_wH 8.62	Test 252 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1mCl^-/T$ p_wH 8.62
Time (min.)					
0	+0.7	+1.9	-1.2	+2.1	-2.1
1	0.0	+1.3	-0.8	+1.7	-1.2
2	0.0	+1.2	-0.6	+1.6	-1.0
5		+1.0	-0.7	+1.5	-0.8
10		+0.6	-0.8		
Final	0.0 (4)	+0.5 (13)	-0.8 (10)	+1.5 (9)	-0.7 (7)

Electrode No. 5 | 11/6/64 | Initial Standard Solution 0.1m HCl

Solution	Test 257 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m Cl^-/T p_wH 8.21	Standard 0.1m HCl (10 min.) 0.1m Cl^-/T p_wH 8.21	Test 258 0.1m Cl^-/T 2.0m NaCl p_wH 8.46	Standard 0.1m Cl^-/T p_wH 8.21
Time (min.)					
0	+4.6	-0.9	-1.9	+3.2	-1.5
1	+1.7	-0.2	-0.4	+2.4	-0.7
2	+1.4	-0.1	-0.2	+2.1	-0.5
5	+1.2	0.0	-0.1	+1.8	-0.2
10	+1.1		-0.1	+1.7	-0.1
15			+0.1		
Final	+1.1 (13)	0.0 (9)	+0.1 (17)	+1.6 (13)	-0.1 (11)

This was the last date upon which this electrode was error-free in 0.1m HCl. However in a few subsequent experimental runs the electrode was tested using 0.1m HCl as a standard solution. For the purpose of tabulation, the data for these tests has been treated as if 0.1m HCl were a standard solution but the word "standard" has been omitted from the columns.

Electrode No. 5 | 16/6/64 | Initial Standard Solution 0.1m HCl

Solution	Test 265 0.1m Cl^-/T 2.0m NaCl p_wH 8.46	0.1m HCl	Test 266 0.1m Cl^-/T 1.0m NaCl p_wH 8.43
Time (min.)			
0	+8.0	-1.9	+5.8
1	+3.5	-1.3	+4.2
2	+2.6	-0.9	+3.4
5	+2.0	-0.6	+2.3
10	+1.7	-0.4	+1.8
15	+1.6	-0.3	+1.6
20	+1.5		+1.5
25			+1.4
Final	+1.5 (21)	-0.1 (40)	+1.4 (29)

Electrode No. 5 18/6/64 Initial Solution

0.1m HCl

Solution	Test 273 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl	Test 274 0.1m Cl^-/T 2.0m NaCl p_wH 8.46
Time (min.)			
0	+5.4	-3.0	+5.3
1	+2.6	-1.7	+3.8
2	+2.0	-1.2	+3.1
5	+1.5	-0.8	+2.6
10	+1.2	-0.7	+2.5
15	+1.0	-0.7	
Final	+1.0 (18)	-0.7 (16)	+2.4 (13)

Electrode No. 5. 9/7/64 (1) Initial Solution 0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.23	295 0.1m HCl	Test 296 0.1m HCl 1.0m NaCl	0.1m HCl	Test 297 0.1m HCl 1.0m NaCl
Time (min.)					
0	+0.9	-2.6	-3.4	+2.6	-4.8
1	+0.4	-0.6	-2.3	+0.5	-2.5
2	+0.4	-0.4	-2.1	+0.3	-2.2
5	+0.3	-0.4	-2.0	+0.1	-2.1
10			-1.9	0.0	-2.0
Final	+0.3 (8)	-0.4 (8)	-1.9 (10)	0.0 (13)	-2.0 (11)

Electrode No. 5 | 9/7/64 (1) (Cont.) | Initial Solution 0.1m HCl

Solution	0.1m HCl	Test 298 0.1m Cl^-/T 1.0m NaCl p_wH 8.43
Time (min.)		
0	+2.6	+7.3
1	+0.5	+6.2
2	+0.3	+5.3
5	+0.1	+3.6
10	0.0	+2.4
15		+2.0
20		+1.8
40		+1.5
Final	0.0 (11)	+1.4 (45)

Electrode No. 5 — 9/7/64 (2) — Initial Solution: 0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.23	299 0.1m HCl	Test 300 0.1m HCl 1.0m NaCl	0.1m HCl	Test 301 0.1m Cl^-/T 1.0m NaCl p_wH 8.43
Time (min.)					
0	+1.0	-2.5	-3.5	+2.4	+6.9
1	+0.5	-0.6	-2.5	+0.2	+5.6
2	+0.5	-0.5	-2.3	+0.1	+4.7
5	+0.4	-0.5	-2.2	-0.1	+3.3
10					+2.4
15					+2.0
20					+1.9
25					
Final	+0.3 (8)	-0.5 (7)	-2.2 (7)	-0.2 (9)	+1.8 (23)

Electrode No. 5 9/7/64 (3) Initial Solution

0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.23	302 0.1m HCl	Test 303 0.1m Cl^-/T 1.0m NaCl p_wH.8.43
Time (min.)			
0	+0.8	-2.4	+5.9
1	+0.6	-0.7	+4.8
2	+0.7	-0.6	+4.2
5	+0.7	-0.5	+3.2
10		-0.4	+2.5
15			+2.2
20			+2.0
Final	+0.8 (8)	-0.4 (12)	+1.9 (22)

Electrode No. 5 10/7/64 Initial Solution

$0.1mCl^-/T$, 1.0m NaCl p_wH 8.43.

Test 304

Final e.m.f. constant for 5 mins.

Solution	Standard* $0.1mCl^-/T$ p_wH 8.23	305 0.1m HCl	Test 306 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43	Standard $0.1mCl^-/T$ p_wH 8.23	Test 307 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43
Time (min.)					
0	-1.2	-1.8	+5.2	-0.1	+1.3
1	-1.1	-0.6	+3.0	+0.2	+1.8
2	-1.0	-0.6	+2.6	+0.3	+1.8
5	-1.1	-0.6	+2.3	+0.4	+1.6
10			+2.0	+0.6	+1.4
15			+1.9		
20			+1.9		
25			+1.9		
30			+1.9		
Final	-1.1 (9)	-0.6 (8)	+1.9 (30)	+0.6 (15)	+1.4 (14)

* Values relative to final e.m.f. in test solution.

Electrode No. 5 10/7/64 (Cont.)

Solution	Standard 0.1m Cl^-/T p_wH 8.23	Test 308 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl	Test 309 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	0.1m HCl
Time (min.)					
0	-0.3	+0.9	-1.3	+5.9	-2.3
1	0.0	+1.4	-0.9	+3.5	-1.2
2	0.0	+1.5	-0.8	+3.0	-0.9
5	0.0	+1.4	-0.7	+2.5	-0.5
10		+1.3	-0.7	+2.2	-0.2
15				+2.1	-0.1
20				+2.0	
Final	+0.1 (35)	+1.3 (10)	-0.7 (10)	+2.0 (20)	0.0 (17)

Electrode No. 5 10/7/64 (Cont.)

Solution	Test 310 0.1m HCl 1.0m NaCl	0.1m HCl	Test 311 0.1m HCl 1.0m NaCl
Time (min.)			
0	-4.3	+1.5	-3.8
1	-2.5	+0.2	-2.5
2	-2.4	+0.1	-2.4
5	-2.4	+0.1	-2.3
10		+0.1	
Final	-2.4 (9)	+0.1 (10)	-2.3 (7)

Electrode No. 5 — 18/8/64 — Initial Standard Solution 1.00m H_2SO_4

Solution	Standard 0.1m H_2SO_4	Test 333 0.1m HCl	Standard 0.1m Cl^-/T p_wH 8.31	Test 334 0.1m HCl	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.2	-1.7	+0.4	-2.7	+1.1
1	-0.1	-1.1	-0.1	-1.0	+0.2
2	0.0	-0.7	-0.1	-0.6	+0.1
5	0.0	-0.5	0.0	-0.4	0.0
10	0.0	-0.4		-0.5	-0.1
15				-0.4	
Final	0.0 (13)	-0.4 (10)	+0.1 (8)	-0.4 (15)	-0.1 (10)

Electrode No. 5 — 5/11/64 — Initial Standard Solution 1.0m H_2SO_4

Solution	Standard 0.1m H_2SO_4	Test 340 0.1m HCl	Standard 1.0m H_2SO_4	Test 341 0.1m HCl	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.2	-0.9	0.0	-1.2	+0.6
1	-0.1	-1.1	-0.1	-1.1	+0.2
2	0.0	-1.1	-0.1	-0.9	+0.1
5	0.0	-0.8	0.0	-0.7	0.0
10	0.0	-0.5			
15	-0.1				
Final	-0.1 (18)	-0.5 (13)	0.0 (8)	-0.6 (7)	0.0 (7)

Electrode No. S 5/11/64 (Cont.)

Solution2	Test 342 0.5m HCl	Standard 0.1m H_2SO_4
Time (min.)		
0	-7.9	+1.3
1	-8.3	+0.6
2	-7.4	+0.4
5	-6.6	+0.2
10	-6.3	+0.1
15	-6.3	
Final	-6.2 (15)	+0.1 (11)

Electrode No. 5 — 11/5/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/T p_wH 8.63	Test 79 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m H_2SO_4	Test 80 0.5m HCl	Standard 0.1m H_2SO_4 (11 min.) 0.1m Cl^-/T p_wH 8.63
Time (min.)					
0	-0.5	+1.8	-1.0	-2.1	+2.8
1	-0.2	+1.0	-0.3	-3.2	+0.5
2	-0.1	+1.1	-0.2	-4.5	+0.1
5	-0.1	+1.2	0.0	-8.2	-0.1
10		+1.3		-9.3	-0.1
15				-9.5	-0.1
20				-9.5	
25					
Final	-0.1 (7)	+1.3 (11)	0.0 (9)	-9.5 (20)	-0.1 (18)

Electrode No. 5 11/5/65 (Cont.)

Solution	Test 81 0.1mCl^-/l 1.0m NaCl p_wH 8.83	Standard 0.1mCl^-/l p_wH 8.63
Time (min.)		
0	+6.5	-4.0
1	+6.8	-3.4
2	+6.5	-3.0
5	+5.1	-2.1
10	+3.8	-1.2
15	+3.1	-0.8
20	+2.8	
25	+2.6	
	+2.3 (46)	-0.3 (40)
Final	+2.2 (55)	-0.3 (42)

Electrode No. 5. 18/6/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Br^-/E p_wH 9.75 (13 min.) 0.1mCl^-/E p_wH 10.34	Test 108 0.1mCl^-/E 1.0m KCl p_wH 10.56	Standard 0.1mCl^-/E p_wH 10.34	Test 109 0.1mCl^-/E 2.0m KCl p_wH 10.65	Standard 0.1mCl^-/E p_wH 10.34 (11 min.) 0.1m Br^-/E p_wH 9.75
Time (min.)					
0	-0.5	+9.9	-2.1	+15.3	-2.9
1	-0.3	+8.0	-0.4	+12.0	-0.4
2	-0.3	+7.5	-0.1	+11.1	-0.1
5	-0.1	+7.1	0.0	+10.3	+0.1
10	0.0	+7.0	+0.1	+10.0	+0.2
15	-0.1			+10.0	+0.2
20	0.0				+0.3
Final	0.0 (21)	+7.0 (13)	+0.1 (10)	+10.0 (17)	+0.3 (21)

Electrode No. 3. 13/7/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Test 120 0.1m Cl^-/E 2.0m KCl p_wH 10.65	Standard 0.1m H_2SO_4	Test 121 0.1m Br^-/E 1.0m KBr p_wH 10.01	Standard 0.1m H_2SO_4 (9 min.) 0.1m Br^-/E p_wH 9.75	Test 122 0.1m Br^-/E 1.0m KBr p_wH 10.01
Time (min.)					
0	+15.8	-1.5	+5.8	-1.1	+6.5
1	+12.0	-0.4	+4.5	-0.3	+4.7
2	+11.3	-0.2	+4.2	-0.1	+4.4
5	+10.5	0.0	+3.9	0.0	+4.0
10	+10.2	0.0	+3.9	-0.1	+3.9
15	+10.1			0.0	
Final	+10.1 (15)	+0.1 (35)	+3.9 (10)	0.0 (17)	+3.9 (12)

Electrode No. 5 | 29/7/65 | Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.08	Test 127 0.1m Cl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1m Cl^-/E p_wH 10.08	Test 128 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 10.08 (10 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.3	+6.5	-1.3	+15.3	-1.5
1	-0.3	+6.2	-0.1	+14.6	-0.2
2	-0.2	+6.2	+0.1	+14.6	+0.1
5	-0.2	+6.3	+0.2	+14.7	+0.2
10		+6.4		+14.9	+0.1
15					+0.2
20					
Final	-0.2 (8)	+6.4 (10)	+0.2 (9)	+15.0 (13)	+0.2 (18)

Electrode No. 5 29/7/65 (Cont.)

Solution	Test 129 0.5m HCl	Standard 0.1m H_2SO_4	Test 130 1.0m HCl	Standard 0.1m H_2SO_4	Standard 0.1m Cl^-/E p_wH 10.08
Time (min.)					
0	-23.5	+4.0	-44.7	+10.0	-0.4
1	-18.5	+0.3	-36.9	+2.6	-0.4
2	-16.8	-0.2	-34.0	+1.5	-0.3
5	-15.6	-0.6	-32.3	+0.6	-0.3
10	-15.0	-0.6	-29.8	+0.2	
15	-14.8		-29.0	+0.1	
20	-14.6		-28.6		
25			-28.3		
30			-28.2		
Final	-14.5 (21)	-0.6 (11)	-28.1 (32)	+0.1 (16)	-0.3 (9)

Electrode No. 5 29/7/65 (Cont.)

Solution	Test 131 0.1mCl^-/E +1m NaCl p_wH 10.49
Time (min.)	
0	+35.0
1	+37.7
2	+38.4
5	+37.5
10	+34.3
15	
20	
25	+28.9
30	+28.1
35	+27.5
40	+27.0
Final	+26.3 (50)

Electrode No. 5 4/8/65 Initial Standard Solution

$0.1mCl^-/E$ p_wH 10.08

Solution	Standard $0.1mCl^-/E$ p_wH 9.41	Test 134 $0.1mCl^-/E$ 1.0m NaCl p_wH 10.49	Standard $0.1mCl^-/E$ p_wH 10.08 (12 min.) $0.1mCl^-/E$ p_wH 9.41	Test 135 $0.1mCl^-/E$ 1.0m NaCl p_wH 9.85	Standard $0.1mCl^-/E$ p_wH 9.41
Time (min.)					
0	-0.2	+16.4	-0.7	+7.8	-0.3
1	0.0	+16.5	+0.2	+7.7	+0.2
2	0.0	+16.7	+0.2	+7.8	+0.2
5	0.0	+17.1	0.0	+8.0	+0.1
10		+17.4	-0.1	+8.1	
15		+17.4	-0.2	+8.1	
20		+17.4			
25		+17.4			
Final	0.0 (7)	+17.4 (25)	-0.2 (18)	+8.1 (15)	+0.1 (8)

Electrode No. 5 — 11/8/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.41	Test 146 0.1m Cl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1m Cl^-/E p_wH 9.41	Test 147 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 9.41
Time (min.)					
0	+0.5	+7.7	-0.4	+16.1	-0.8
1	+0.2	+6.2	+0.3	+15.2	+0.1
2	+0.2	+6.3	+0.3	+15.3	+0.1
5	+0.3	+6.5	+0.3	+15.6	0.0
10		+6.7	+0.2	+15.8	-0.1
15		+6.9			
20					
Final	+0.3 (8)	+6.9 (18)	+0.2 (10)	+15.8 (14)	-0.1 (10)

Electrode No. 5 11/8/65 (Cont.)

Solution	Test 148 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m Cl^-/E p_wH 9.41 (10 min.) 0.1m H_2SO_4	Test 149 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m H_2SO_4
Time (min.)				
0	+4.4	-1.6	+16.4	0.0
1	+4.1	-0.1	+15.2	+0.3
2	+4.0	+0.1	+15.2	+0.4
5	+4.1	+0.2	+15.7	+0.2
10		+0.1	+16.0	+0.1
15		-0.1		
Final	+4.1 (9)	-0.2 (18)	+16.0 (11)	+0.1 (10)

Electrode No. 5 24/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.52	Test 150 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 9.56	Standard 0.1m Cl^-/E p_wH 10.52	Test 151 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m Cl^-/E p_wH 10.52 (11 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.1	+1.4	-0.3	+4.2	-1.8
1	0.0	+1.2	0.0	+3.9	-0.3
2	0.0	+1.0	0.0	+3.8	0.0
5	0.0	+0.9	0.0	+3.7	+0.1
10		+0.9	+0.1	+3.7	+0.1
15					+0.1
20					+0.1
25					
Final	0.0 (7)	+0.9 (10)	+0.1 (12)	+3.7 (12)	+0.1 (20)

Electrode No. 5 24/8/65 (Cont.)

Solution	Test 152 0.5m HCl	Standard 0.1m H_2SO_4 (17 min.) 0.1mCl^-/E p_wH 10.52	Test 153 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1mCl^-/E p_wH 10.52	Standard 0.1m H_2SO_4
Time (min.)					
0	-25.7	+4.7	+7.0	-1.0	-0.3
1	-20.3	+1.7	+8.6	-1.6	-0.1
2	-17.7	+0.9	+9.7	-2.2	-0.1
5	-15.5	+0.2	+11.1	-2.8	0.0
10	-14.4	-0.1	+11.7	-2.8	0.0
15	-13.9	-0.3	+11.8	-2.6	
20	-13.6	-0.3	+11.5	-2.2	
25	-13.4	-0.3	+11.3	-2.0	
30	-13.2		+11.0	-1.7	
35			+10.8	-1.8	
50			+10.2		
Final	-12.9 (60)	-0.3 (25)	+9.3 (80)	-0.9 (60)	0.0 (10)

Electrode No. 5 24/8/65 (Cont.)

Solution	Test 154 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 9.56	Standard 0.1m H_2SO_4	Test 155 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 9.56	Standard 0.1m H_2SO_4
Time (min.)				
0	+2.4	0.0	+2.2	0.0
1	+2.3	+0.6	+2.0	+0.4
2	+2.3	+0.5	+2.1	+0.4
5	+2.5	+0.3	+2.4	+0.2
10	+2.7	+0.2	+2.6	+0.1
15	+2.8		+2.7	
20	+2.8			
Final	+2.8 (24)	+0.2 (13)	+2.7 (18)	+0.1 (12)

Electrode No. 5 21/12/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 9.83	Test 184 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1mCl^-/E p_wH 9.83	Test 185 0.1mCl^-/E 1.0m NaCl p_wH 9.84	Standard 0.1mCl^-/E p_wH 9.83 (9 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.1	+6.3	-3.1	+7.2	-2.0
1	-0.1	+5.6	-1.2	+6.1	-0.2
2	0.0	+5.3	-0.6	+6.0	-0.1
5	0.0	+4.9	-0.1	+6.1	+0.1
10		+4.8	+0.1	+6.3	0.0
15					+0.1
Final	0.0 (8)	+4.8 (11)	+0.1 (13)	+6.4 (13)	+0.1 (16)

Electrode No. 5 21/12/65 (Cont.)

Solution	Test 186 5.0m HBr	Standard 0.1m H_2SO_4 (21 min.) 0.1m Cl^-/E p_wH 9.83	Test 187 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m Cl^-/E p_wH 9.83
Time (min.)				
0	-14±2	+44±1	+12.8	-9.6
1	-86±2	+13.3	+14.0	-7.8
2	-102.3	+ 5.1	+14.5	-6.7
5	-96.2	+ 0.3	+13.9	-4.2
10	-89.3	- 0.7	+12.6	-2.2
15	-86.6	- 0.8	+11.8	-1.3
20	-83.5	- 0.8	+11.2	-0.8
25		- 0.8	+10.8	
30			+10.5	
35			+10.3	
40	-74.4			
Final	-77.2 (48)	-0.8 (29)	+10.3 (36)	-0.4 (32)

Electrode No. 5. 19/4/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 1m H_2SO_4	Test 206 1m HCl	Standard 0.1m H_2SO_4
Time (min.)			
0	-1.6	-8.3	+13.2
1	-0.3	-16.2	+ 5.9
2	-0.4	-23.7	+ 3.4
5	-0.5	-34.3	+ 1.0
10		-34.9	0.0
15		-34.2	
20		-33.9	
25		-33.6	
Final	-0.6 (7)	-33.5 (50)	0.0 (10)

Electrode No. 5 6/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.01	Test 215 0.1mCl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1mCl^-/E p_wH 10.01 (11 min.) 0.1m H_2SO_4	Test 216 0.1mCl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1m H_2SO_4 (11 min.) 0.1mCl^-/E p_wH 10.01
Time (min.)					
0	-0.3	+21.4	-5.8	+32±1	-7.3
1	+0.1	+17.7	-1.0	+19.5	-1.1
2	+0.1	+17.2	-0.3	+18.3	-0.4
5	+0.1	+17.4	0.0	+17.9	-0.1
10		+17.5	0.0	+17.9	0.0
15		+17.6	0.0		+0.2
20		+17.7			+0.2
25				+17.9	
30				+18.0	
Final	+0.1 (8)	+17.7 (23)	0.0 (19)	+18.0 (30)	+0.2 (23)

Electrode No. 5 6/5/66 (Cont.)

Solution	Test 217 0.1m Cl^-/E 0.1m NaCl p_wH 10.31
Time (min.)	
0	+4.9
1	+4.3
2	+4.1
5	+4.1
10	+4.2
Final	+4.2 (11)

Electrode No. 5. 3/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard Acetate 1.0m Na^+ p_wH 4.75	Test 379* Acetate 0.1m F^- approx. p_wH 4.8	Standard Acetate 1.0m Na^+ p_wH 4.75
Time (min.)			
0	0.0	-3.8	-2.3
1	0.0	-6.7	-1.0
2	0.0	-7.3	-0.6
5	-0.1	-7.7	-0.5
10		-7.4	
Final	-0.1 (6)	-7.3 (14)	-0.5 (8)

* On account of the instability of the potential of the hydrogen electrode for this solution, these are observed rather than true values. They have been included to indicate the time variation of the glass electrode potential (See Chapter 9).

Electrode No. 5 17/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/E p_wH 9.93	Test 233 0.1m Cl^-/E 1.0m KCl p_wH 10.05	Standard 0.5m Cl^-/E p_wH 9.93	Test 234 0.1m Cl^-/T 1.0m KCl p_wH 9.13	Standard 0.5m Cl^-/E p_wH 9.93 (10 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.3	+9.0	-2.3	+3.7	-2.7
1	-0.2	+7.0	-1.0	+2.7	-0.4
2	-0.1	+6.6	-0.6	+2.5	-0.2
5	-0.1	+6.3	-0.3	+2.4	0.0
10		+6.0	-0.2		+0.1
15		+5.8			+0.1
20		+5.8			+0.1
Final	-0.1 (7)	+5.8 (21)	-0.2 (11)	+2.3 (9)	+0.1 (20)

Electrode No. 5 17/8/66 (Cont.)

Solution	Test 235 0.1m Cl^-/E 1.0m KCl p_wH 10.05	Standard 0.1m H_2SO_4
Time (min.)		
0	+9.1	-2.2
1	+7.4	-0.9
2	+6.9	-0.6
5	+6.3	-0.3
10	+6.0	-0.1
15	+5.8	
20	+5.8	
Final	+5.7 (23)	-0.1 (12)

Electrode No. 6. E.I.L. GG 33.

				E_7
25/2/64	Mounted and placed in deionised water			
28/2/64 to 5/6/64	HCl Tris Buffers	0.1m		0.384 to 0.386
11/6/64 and 18/6/64	HCl Sodium Solution	0.1m 1.0m 2.0m	 p_wH 8.43 p_wH 8.46	0.384
19/5/65 and 21/5/65	HCl Sodium Solution	0.5m 1.0m	 p_wH 8.83	0.385
11/8/65	HCl Sodium Solution Lithium Solution	1.0m 1.0m 1.0m	 p_wH 10.49 p_wH 10.59	0.385

Resistance 45 Megohms

Electrode No. 6 — 11/6/64 — Initial Standard Solution 0.1m HCl

Solution	Standard $0.1mCl^-/T$ p_wH 8.21	Test 253 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43	Standard $0.1mCl^-/T$ p_wH 8.21	Test 254 $0.1mCl^-/T$ 2.0m NaCl p_wH 8.46	Standard $0.1mCl^-/T$ p_wH 8.21
Time (min.)					
0	+1.0	+2.6	-1.6	+2.9	-1.3
1	+0.2	+2.4	-1.0	+2.8	-0.7
2	+0.2	+2.0	-0.7	+2.6	-0.5
5	+0.2	+1.5	-0.4	+2.2	-0.3
10		+1.2		+2.0	-0.2
15		+1.1		+1.9	
20					
25					
30			-0.1		
35			-0.1		
Final	+0.2 (5)	+1.1 (16)	-0.1 (35)	+1.9 (15)	-0.1 (12)

Electrode No. 6 11/6/64 (Cont.)

Solution	0.1m HCl
Time (min.)	
0	-0.9
1	-0.7
2	-0.5
5	-0.3
10	-0.2
Final	-0.2 (10)

* This was the last data upon which this electrode was error-free in 0.1m HCl. However in a few subsequent experimental runs the electrode was tested using 0.1m HCl as a standard solution. For the purpose of tabulation, the data for these tests has been treated as if 0.1m HCl were a standard solution but the word "standard" has been omitted from the columns.

Electrode No. 6 — 18/6/64 (1) — Initial Solution 0.1m HCl

Solution	Test 278 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m Cl^-/T p_wH 8.21	Test 279 0.1m Cl^-/T 2.0m NaCl p_wH 8.46
Time (min.)			
0	+4.7	-0.6	+1.9
1	+1.7	+0.2	+1.8
2	+1.5	+0.4	+1.7
5	+1.5	+0.5	+1.5
10		+0.3	+1.3
15			
Final	+1.5 (8)	+0.3 (11)	+1.2 (14)

Electrode No. 6 — 18/6/64 (2) — Initial Standard Solution $0.1mCl^-/T$ p_wH 8.21

Solution	280 0.1m HCl	Standard $0.1mCl^-/T$ p_wH 8.21	Test 281 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43
Time (min.)			
0	-1.5	+0.8	+1.9
1	-0.9	+0.1	+1.6
2	-0.6	+0.1	+1.4
5	-0.3	+0.1	+1.2
10	-0.3		+1.0
Final	-0.3 (10)	+0.1 (6)	+1.0 (10)

Electrode No. 6 19/5/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 1.0m H_2SO_4 (7 min.) 0.1m Cl^-/T p_wH 8.63	Test 90 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.63 (10 min.) 0.1m H_2SO_4	Standard 1.0m H_2SO_4	Standard 0.1m H_2SO_4 (10 min.) 0.1m Cl^-/T p_wH 8.63
Time (min.)					
0	+0.2	+1.8	-0.5	-0.3	0.0
1	-0.2	+1.1	-0.3	-0.2	-0.1
2	-0.1	+1.1	-0.2	-0.1	-0.2
5	-0.1	+1.4	-0.1	0.0	-0.1
10	-0.3	+1.6	0.0	0.0	-0.1
15	-0.1		-0.1	+0.1	-0.1
20			0.0		-0.1
Final	-0.1 (17)	+1.7 (14)	0.0 (20)	+0.1 (40)	-0.1 (20)

Electrode No. 6 19/5/65 (Cont.)

Solution	Test 91 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.63 (7 min.) 0.1m H_2SO_4	Test 92 0.5m HCl	Standard 0.1m H_2SO_4 (13 min.) 0.1m Cl^-/T p_wH 8.83	Test 93 0.1m Cl^-/T 1.0m NaCl p_wH 8.83
Time (min.)					
0	+1.7	-0.3	-2.1	+3.3	+6.6
1	+1.3	-0.1	-3.0	+1.0	+7.0
2	+1.3	0.0	-3.9	+0.4	+6.8
5	+1.5	0.0	-6.0	0.0	+5.7
10	+1.7	-0.2	-6.3	-0.1	+4.4
15	+1.8	0.0		-0.2	+3.9
20		+0.1		-0.2	+3.5
25					+ 3.3
Final	+1.8 (15)	+0.1 (20)	-6.3 (40)	-0.2 (20)	+2.9 (50)

Electrode No. 6 19/5/65 (Cont.)

Solution	Standard $0.1m Cl^-/T$ p_wH 8.63
Time (min.)	
0	-2.9
1	-3.2
2	-2.9
5	-2.0
10	-1.2
15	-0.8
20	-0.5
Final	0.0 (70)

Electrode No. 6 21/5/65 Initial Standard Solution

0.1m HBr

Solution	Test 94 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m HBr	Test 95 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m HBr	Test 96 0.1m Cl^-/T 1.0m NaCl p_wH 8.83
Time (min.)					
0	+1.8	-1.9	+2.3	-1.7	+2.3
1	+1.9	-0.3	+1.9	-0.4	+2.0
2	+2.0	-0.2	+2.0	-0.3	+2.0
5	+2.1	-0.1	+2.1	-0.2	+2.2
10	+2.2		+2.2	-0.1	
15					
Final	+2.2 (10)	-0.1 (9)	+2.2 (10)	-0.1 (10)	+2.3 (30)

Electrode No. 6 21/5/65 (Cont.)

Solution	Standard $0.1m Cl^-/T$ p_wH 8.64	Standard 1.0m H_2SO_4	Standard 0.1m HBr (9 min.) $0.1m Cl^-/T$ p_wH 8.64	Test 97 $0.1m Cl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1m Cl^-/T$ p_wH 8.64 (9 min.) 0.1m HBr
Time (min.)					
0	-0.8	-0.2	-0.5	+2.2	-1.0
1	-0.2	-0.3	-0.2	+2.0	-0.1
2	-0.1	-0.3	-0.1	+2.0	-0.1
5	0.0	-0.3	0.0	+2.1	0.0
10	0.0		0.0	+2.2	-0.2
15			0.0		-0.1
Final	0.0 (10)	-0.2 (8)	0.0 (17)	+2.2 (10)	0.0 (17)

Electrode No. 6 21/5/65 (Cont.)

Solution	Test 98 0.5m HCl	Standard 0.1m HBr	Standard 0.1m Cl^-/T p_wH 8.64	Test 99 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.64
Time (min.)					
0	-3.4	+4.9	-0.1	+4.9	-2.4
1	-6.7	+1.4	-0.1	+5.0	-1.9
2	-7.0	+0.6	-0.1	+4.9	-1.7
5	-7.4	0.0	-0.1	+4.3	-1.2
10	-7.1	-0.1		+3.7	-0.7
15	-6.9			+3.4	-0.4
20	-6.8			+3.2	-0.2
25				+3.1	
Final	-6.8 (20)	+0.1 (40)	-0.1 (8)	+3.1 (29)	-0.2 (35)

Electrode No. 6 21/5/65 (Cont.)

Solution	Standard 1.0m H_2SO_4	Standard 0.1m Cl^-/T p_wH 8.64	Test 100 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.64
Time (min.)				
0	-0.2	-0.1	+3.3	-1.5
1	-0.1	-0.1	+3.4	-0.9
2	-0.1	-0.1	+3.5	-.0.8
5	0.0	-0.1	+3.4	-0.6
10			+3.2	-0.3
15			+3.1	
20				
25				
30	+0.3			
35	+0.3			
Final	+0.3 (36)	-0.1 (7)	+3.0 (19)	-0.2 (12)

Electrode No:6 11/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 9.41	Test 140 0.1mCl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1mCl^-/E p_wH 9.41	Test 141 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1mCl^-/E p_wH 9.41
Time (min.)					
0	+0.1	+6.1	-0.7	+4.3	-1.6
1	+0.1	+5.7	-0.1	+3.5	-0.2
2	+0.2	+5.7	0.0	+3.3	0.0
5	+0.2	+5.9	+0.1	+3.4	+0.1
10		+6.2		+3.6	+0.2
15				+3.7	
20					0.0
25					+0.1
Final	+0.3 (9)	+6.2 (11)	+0.1 (8)	+3.7 (17)	+0.1 (27)

Electrode No. 6 11/8/65 (Cont.)

Solution	Test 142 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 9.41	Standard 0.1m H_2SO_4	Test 143 1.0m HCl	Standard 0.1m H_2SO_4 (25 min.) 0.1m Cl^-/E p_wH 9.41
Time (min.)					
0	+14.0	-0.3	-0.3	-19.7	+2.5
1	+13.2	+0.6	-0.4	-29.4	-1.6
2	+13.2	+0.7	-0.4	-27.9	-1.9
5	+13.6	+0.8	-0.4	-26.6	-1.8
10	+14.2			-26.4	-1.6
15	+14.6			-26.4	-1.3
20	+14.8				-1.3
25	+15.1				
30					-0.7
35					-0.5
Final	+15.7 (60)	+0.7 (9)	-0.4 (7)	-26.4 (15)	-0.5 (36)

Electrode No. 6 11/8/65 (Cont.)

Solution	Test 144 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m Cl^-/E p_wH 9.41	Test 145 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 9.41
Time (min.)				
0	+6.0	-2.7	+23.0	-6.6
1	+7.1	-2.2	+22.8	-5.5
2	+7.4	-2.1	+21.8	-4.5
5	+7.4	-1.5	+20.0	-2.7
10	+7.1	-0.7	+19.1	-1.5
15	+6.8	-0.3	+18.7	-0.9
20		-0.1	+18.5	-0.5
25		-0.2	+18.4	
30		0.0	+18.3	
Final	+6.4 (40)	+0.1 (33)	+18.3 (31)	+0.2 (45)

Electrode No. 7. Radiometer C.

				E_7
15/5/64	Mounted and placed in deionised water.			
2/6/64	Sodium Solution	1.0m	p_wH 8.83	0.649
16/7/64	HCl	0.1m +	1.0m NaCl	0.633
	Sodium Solution	1.0m	p_wH 8.43	
	Lithium Solution	1.0m	p_wH 8.48	
21/7/64	HCl	0.1m +	1.0m NaCl	0.645
	Sodium Solution	1.0m	p_wH 8.43	
6/8/64	Lithium Solution	1.0m	p_wH 9.27	0.624
10/8/65	HCl	1.0m		0.627
	Lithium Solution	1.0m	p_wH 10.59	
	Sodium Solution	1.0m	p_wH 10.49	
11/5/66	Lithium Solution	1.0m	p_wH 11.81	0.634
9/8/66	Sodium Solution	1.0m	p_wH 9.16	0.660

Resistance 220 Megohms.

It can be seen that the value of E_7 shown by this electrode was rather erratic. The reason for this is not known. However the coaxial cable for electrode No. 7 had rubber insulation between the high impedence lead and the screening and this may not have been entirely satisfactory. The coaxial cables of all the other glass electrodes tested had polythene insulation.

Electrode No. 7 2/6/64 (1) Initial Standard Solution

0.1m HCl

Solution	Test 367 $0.1mCl^-/T$ 0.5m NaCl p_wH 8.78	Standard 0.1m HCl	Test 368 $0.1mCl^-/T$ 0.5m NaCl p_wH 8.78	Standard 0.1m HCl (13 min.) $0.1mCl^-/T$ p_wH 8.62
Time (min.)				
0	+3.2	-1.5	+3.0	-2.1
1	+0.8	-1.1	+1.0	-1.1
2	+0.5	-0.8	+0.9	-0.8
5	+0.4	-0.4	+0.8	-0.4
10		-0.2		-0.2
15		-0.2		-0.1
Final	+0.3 (9)	-0.2 (17)	+0.7 (9)	0.0 (19)

Electrode No. 7 2/6/64 (2) Initial Standard Solution

0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.62	Test 369 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.62
Time (min.)			
0	+2.5	+1.7	-3.0
1	+0.1	+0.8	-0.4
2	+0.1	+0.8	-0.3
5	+0.1	+0.9	-0.1
Final	+0.1 (6)	+0.9 (7)	0.0 (9)

Electrode No. 7 6/8/64 Initial Standard Solution

0.1m Cl^-/T p_wH 8.23

Solution	Standard 0.1m Cl^-/T 1.0m LiCl p_wH 8.48	Standard 0.1m Cl^-/T p_wH 8.23	Test 370 0.1m Cl^-/T 1.0m LiCl p_wH 9.27	Standard 0.1m Cl^-/T p_wH 8.23	Test 371 0.1m Cl^-/T 1.0m LiCl p_wH 9.27
Time (min.)					
0	-0.8	+1.0	-2.4	-0.8	-0.9
1	-0.4	-0.4	-0.2	-0.5	0.0
2	-0.2	-0.3	+0.2	-0.3	+0.3
5	-0.1	-0.2	+0.4	-0.2	+0.5
10				-0.2	+0.6
			+0.6 (30)		
Final	0.0 (9)	-0.2 (8)	+0.6 (37)	-0.1 (12)	+0.7 (14)

Electrode No. I 6/8/64 (Cont.)

Solution	Standard 0.1m Cl^-/T p_wH 8.23	Test 372 0.1m Cl^-/T 1.0m LiCl p_wH 9.27	Standard 0.1m Cl^-/T p_wH 8.23
Time (min.)			
0	+5±1	+1.0	+4±1
1	+0.3	+0.5	+0.2
2	+0.1	+0.6	+0.1
5	+0.1	+0.6	+0.1
Final	+0.1 (7)	+0.7 (8)	+0.1 (8)

Electrode No. 7 10/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 9.41	Test 61 0.1mCl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1mCl^-/E p_wH 9.41	Test 55 0.1mCl^-/E 0.5mLi_2SO_4 p_wH 10.59	Standard 0.1mCl^-/E p_wH 9.41 (10 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.6	+1.8	-2.3	+2.3	-0.7
1	+0.1	+2.5	-0.4	+2.5	-0.2
2	+0.2	+2.6	-0.1	+2.6	-0.1
5	+0.2	+2.6	0.0	+2.7	0.0
10			+0.2	+2.8	+0.1
15				+2.9	0.0
Final	+0.2 (8)	+2.7 (8)	+0.2 (11)	+2.9 (17)	0.0 (18)

Electrode No. 7 10/8/65 (Cont.)

Solution	Standard 1.0m HCl	Standard 0.1m H_2SO_4 (8 min.) 0.1m Cl^-/E p_wH 9.41	Test 62 0.1m Cl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1m Cl^-/E p_wH 9.41	Test 63 0.1m Cl^-/E 1.0m NaCl p_wH 10.49
Time (min.)					
0	-2.0	+1.1	+2.1	-1.1	+6.4
1	-0.3	-0.1	+2.6	-0.5	+5.5
2	-0.2	-0.1	+2.6	-0.2	+5.4
5	-0.1	0.0	+2.6	-0.1	+5.3
					+5.4 (8)
10		+0.1			
15		+0.2			
					+5.4 (30)
Final	0.0 (9)	+0.2 (17)	+2.6 (8)	0.0 (8)	+5.4 (35)

Electrode No. 7 10/8/65 (Cont.)

Solution	Standard 0.1mCl^-/E p_wH 9.41
Time (min.)	
0	-1.4
1	-0.8
2	-0.5
5	-0.2
10	0.0
Final	0.0 (12)

Electrode No. 7 — 11/5/66 — Initial Standard Solution 0.1m Cl^-/E p_wH 9.45

Solution	Standard 0.1m H_2SO_4	Standard 0.1m Cl^-/E p_wH 9.45	Test 53 0.1m Cl^-/E 1.0m LiCl p_wH 10.20	Standard 0.1m Cl^-/E p_wH 9.45	Test 52 0.01m LiOH 0.99m LiCl p_wH 11.81
Time (min.)					
0	-1.4	-0.2	+3.0	+0.3	+14.4
1	-0.4	-0.3	+1.8	-0.4	+16.0
2	-0.2	-0.1	+1.8	-0.2	+16.5
5	0.0	0.0	+1.9	0.0	+17.1
10					+17.6
15					+17.8
20					+18.0
25					+18.3
Final	0.0 (9)	0.0 (9)	+1.9 (9)	-0.1 (9)	+18.3 (26)

Electrode No. 7 11/5/66 (Cont.)

Solution	Standard 0.1m Cl^-/E p_wH 9.45 (13 min.) 0.1m H_2SO_4
Time (min.)	
0	-1.5
1	-0.8
2	-0.5
5	-0.2
10	0.0
15	0.0
20	+0.2
25	+0.3
Final	+0.3 (25)

Electrode No. 7. 9/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.29	Test 380 0.1m Cl^-/T 1.0m NaCl p_wH 9.14	Standard 0.1m Cl^-/E p_wH 10.29	Test 381 Borax 1.0m Na^+ p_wH 9.16
Time (min.)				
0	+1.5	+1.0	+2.5	0.0
1	+0.1	+1.2	-0.1	+1.4
2	+0.1	+1.2	0.0	+1.3
5	+0.1	+1.2	0.0	+1.3
Final	+0.1 (8)	+1.2 (8)	0.0 (8)	+1.3 (8)

Electrode No. 8. E.I.L. GG 33.

				E_7
15/5/64	Mounted and placed in deionised water.			
28/5/64 to 22/7/64	HCl	0.1m + 1.0m NaCl		0.388 to 0.384
	Sodium Solution	1.0m	p_wH 8.83	
		4.9m	p_wH 8.85	
24/7/64	HCl	0.1m		0.385
	Lithium Solution	1.0m	p_wH 9.27	
5/11/64	HCl	0.5m		0.383
11/5/65 and 17/5/65	HCl	0.5m		0.384
	Sodium Solution	1.0m	p_wH 8.83	
1/6/65 to 18/6/65	Potassium Solution	1.0m	p_wH 10.56	0.384
		2.0m	p_wH 10.65	
10/8/65	Sodium Solution	1.0m	p_wH 10.49	0.384
	Lithium Solution	1.0m	p_wH 10.59	
21/1/66	Tetraethylammonium Hydroxide		p_wH 13.14	0.385
14/4/66	HCl	1.0m		0.386
5/5/66	Sodium Solution	1.0m	p_wH 10.55	0.387
3/8/66	$MgSO_4$	1.9m	p_wH 4.16	0.389
	Sodium Solution	1.0m	p_wH 9.16	
	Fluoride Solution	0.1m	approx. p_wH 4.8	
17/8/66	HCl	0.5m		0.389
	Potassium Solution	1.0m	p_wH 10.05	

Resistance 180 Megohms.

Electrode No. 8 28/5/64 Initial Standard Solution

0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.62	Test 240 0.1m Cl^-/T 0.5m NaCl p_wH 8.78	Standard 0.1m Cl^-/T p_wH 8.62	Test 241 0.1m Cl^-/T 0.5m NaCl p_wH 8.78	Standard 0.1m Cl^-/T p_wH 8.62
Time (min.)					
0	-0.3	+0.5	-0.6	+0.3	-0.5
1	-0.1	+0.6	-0.2	+0.5	-0.1
2	0.0	+0.6	-0.1	+0.6	0.0
5	0.0	+0.6	-0.1	+0.6	0.0
Final	0.0 (6)	+0.6 (5)	0.0 (60)	+0.6 (5)	0.0 (8)

Electrode No. 8 28/5/64 (Cont.)

Solution	Test 242 0.1mCl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1mCl^-/T p_wH 8.62	Test 243 0.1mCl^-/T 4.9m NaCl p_wH 8.85	Standard 0.1mCl^-/T p_wH 8.62	Test 244 0.1mCl^-/T 4.9m NaCl p_wH 8.85
Time (min.)					
0	+0.7	-0.4	+4.0	-0.6	+4.1
1	+1.0	-0.1	+4.1	-0.2	+4.2
2	+1.0	0.0	+4.1	-0.1	+4.2
5	+1.0	0.0	+4.2	-0.1	+4.2
Final	+1.0 (9)	0.0 (7)	+4.2 (9)	-0.1 (5)	+4.2 (6)

Electrode No. 8 2/6/64 Initial Standard Solution 0.1m HCl

Solution	Standard 0.1m Cl^-/T p_wH 8.62 (6 min.) 0.1m HCl	Test 246 0.1m Cl^-/T 0.5m NaCl p_wH 8.78	Standard 0.1m HCl Except:- 0.1m Cl^-/T p_wH 8.62 (12-20 min.)	Test 247 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m HCl
Time (min.)					
0	-0.7	+0.9	-0.7	+2.5	-0.8
1	0.0	+0.8	-0.3	+1.5	-0.4
2	+0.1	+0.8	0.0	+1.4	-0.2
5	+0.1	+0.8	+0.1	+1.3	0.0
10	-0.1		+0.2	+1.3	+0.1
15			+0.5		
20			+0.6		
25			+0.5		
Final	-0.1 (13)	+0.8 (6)	+0.5 (26)	+1.3 (10)	+0.1 (30)

Electrode No. 8 2/6/64 (Cont.)

Solution	Standard 0.1m Cl^-/T p_wH 8.62	Test 248 0.1m Cl^-/T 4.9m NaCl p_wH 8.85	Standard 0.1m HCl
Time (min.)			
0	-0.1	+6.0	-5.0
1	+0.1	+5.1	-1.9
2	+0.1	+4.9	-1.3
5	+0.1	+4.6	-0.9
10	+0.1	+4.6	-0.6
15		+4.4	-0.5
Final	+0.1 (10)	+4.4 (18)	-0.5 (17)

Electrode No. 8 — 11/6/64 — Initial Standard Solution 0.1m HCl

Solution	Standard $0.1m Cl^-/T$ p_wH 8.21	Test 259 $0.1m Cl^-/T$ 1.0m NaCl p_wH 8.43	Standard $0.1m Cl^-/T$ p_wH 8.21	Test 260 $0.1m Cl^-/T$ 2.0m NaCl p_wH 8.46	Standard $0.1m Cl^-/T$ p_wH 8.21 (7 min.) 0.1m HCl
Time (min.)					
0	-0.1	+1.0	-0.6	+1.4	-0.5
1	-0.2	+0.7	-0.2	+1.2	-0.1
2	-0.1	+0.7	-0.1	+1.2	0.0
5	-0.1	+0.7	0.0	+1.2	+0.1
10					+0.1
Final	-0.1 (5)	+0.7 (6)	0.0 (7)	+1.2 (6)	+0.2 (13)

Electrode No. 8 16/6/64 (1) Initial Standard Solution 0.1m HCl

Solution	Test 263 0.1m Cl^-/T 2.0m NaCl p_wH 8.46	Standard 0.1m HCl	Test 264 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl
Time (min.)				
0	+3.4	-2.0	+2.5	-1.8
1	+1.7	-0.8	+1.3	-0.6
2	+1.4	-0.5	+1.1	-0.3
5	+1.1	-0.2	+0.9	-0.1
10	+1.0	-0.1	+0.8	0.0
Final	+1.0 (12)	-0.1 (14)	+0.8 (11)	0.0 (11)

Electrode No. 8 16/6/64 (2) Initial Standard Solution

0.1m HCl

Solution	Test 269 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl	Test 270 0.1m Cl^-/T 2.0m NaCl p_wH 8.46	Standard 0.1m HCl
Time (min.)				
0	+2.2	-1.5	+3.7	-2.0
1	+1.1	-0.7	+1.9	-0.9
2	+1.0	-0.4	+1.6	-0.6
5	+0.8	-0.2	+1.2	-0.2
10	+0.7	-0.1	+1.1	-0.1
15				
Final	+0.7 (11)	-0.1 (11)	+1.1 (13)	-0.1 (12)

Electrode No. 8 18/6/64 (1) Initial Standard Solution

0.1m HCl

Solution	Test 275 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl
Time (min.)		
0	+1.5	-1.2
1	+0.8	-0.5
2	+0.7	-0.3
5	+0.6	-0.2
Final	+0.5 (6)	-0.2 (7)

Electrode No. 8 | 18/6/64 (2) | Initial Standard Solution 0.1m HCl

Solution	Standard $0.1m Cl^-/T$ p_wH 8.21	Test 276 $0.1m Cl^-/T$ 2.0m NaCl p_wH 8.46	Standard $0.1m Cl^-/T$ p_wH 8.21 (11 min.) 0.1m HCl	Test 277 $0.1m Cl^-/T$ 1.0m NaCl p_wH 8.43
Time (min.)				
0	-0.2	+2.2	-1.0	+1.5
1	0.0	+1.5	-0.4	+1.1
2	+0.1	+1.4	-0.3	+1.0
5	+0.1	+1.2	-0.2	+0.8
10			-0.1	
15			-0.2	
20				
25				
30		+1.0		
Final	+0.1 (6)	+1.0 (35)	-0.2 (16)	+0.8 (8)

Electrode No. 8 — 9/7/64 — Initial Standard Solution 0.1m HCl

Solution	Standard $0.1mCl^-/T$ p_wH 8.23	Test 289 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43	Standard 0.1m HCl	Test 290 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43	Standard 0.1m HCl
Time (min.)					
0	-0.2	+0.6	-1.1	+1.6	-1.3
1	0.0	+0.6	-0.3	+0.9	-0.3
2	0.0	+0.6	-0.1	+0.8	-0.1
5	-0.1	+0.6	0.0	+0.8	+0.1
Final	-0.1 (8)	+0.6 (6)	0.0 (9)	+0.8 (7)	+0.1 (7)

Electrode No. 8 9/7/64 (Cont.)

Solution	Test 291 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl (13 min.) 0.1m Cl^-/T p_wH 8.23	Test 292 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m Cl^-/T p_wH 8.23	Test 293 0.1m HCl +1m NaCl
Time (min.					
0	+2.2	-1.5	+1.4	-0.9	-1.4
1	+1.0	-0.4	+0.9	-0.4	-0.6
2	+0.9	-0.1	+0.8	-0.2	-0.5
5	+0.8	0.0	+0.7	-0.1	-0.4
10		+0.1			
15		+0.2			
Final	+0.8 (8)	+0.2 (13)	+0.7 (7)	-0.1 (9)	-0.4 (8)

Electrode No. 8 9/7/64 (Cont.)

Solution	Standard 0.1m HCl Except:- 0.1m Cl^-/T p_H 8.23 (5-10 min)	Test 294 0.1m HCl 1.0m NaCl
Time (min.)		
0	+0.7	-1.0
1	+0.2	-0.7
2	+0.1	-0.6
5	+0.1	-0.6
10	+0.2	
15	+0.2	
Final	+0.2 (15)	-0.6 (6)

Electrode No. 8 21/7/64 Initial Standard Solution 0.1m HCl

Solution	Standard 0.01m HCl 1.0m NaCl	Test 317 0.1m HCl 1.0m NaCl	Standard 0.1m HCl	Test 318 0.1m HCl 1.0m NaCl	Standard 0.1m HCl
Time (min.)					
0	+0.2	-1.3	+0.7	-1.4	+0.8
1	0.0	-0.8	0.0	-0.8	+0.1
2	0.0	-0.7	0.0	-0.6	0.0
5	0.0	-0.7	-0.1	-0.6	0.0
10					0.0
15					0.0
Final	0.0 (5)	-0.7 (9)	-0.1 (7)	-0.6 (8)	0.0 (17)

Electrode No. 8. 21/7/64 (Cont.)

Solution	Test 319 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl	Standard 0.01m HCl 1.0m NaCl	Test 320 0.1m HCl 1.0m NaCl
Time (min.)				
0	+4.1	-2.4	0.0	-1.2
1	+2.5	-1.5	0.0	-0.7
2	+1.9	-1.1	0.0	-0.6
5	+1.2	-0.5	0.0	-0.6
10	+1.0	-0.3		
15	+0.9	-0.1		
20		-0.1		
25		-0.1		
30		0.0		
35		-0.1		
Final	+0.9 (19)	-0.1 (38)	0.0 (5)	-0.6 (7)

Electrode No. 8. 22/7/64 (1) Initial Standard Solution 0.1m HCl

Solution	Standard 0.01m HCl 1.0m NaCl	Test 323 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.01m HCl 1.0m NaCl (11 min.) 0.1m HCl	Test 324 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl (9 min.) 0.01m HCl 1.0m NaCl
Time (min.)					
0	+0.2	+1.6	-1.4	+2.2	-1.5
1	0.0	+1.0	-0.6	+1.4	-0.6
2	0.0	+0.9	-0.4	+1.2	-0.4
5	-0.1	+0.8	-0.2	+1.0	-0.1
10			-0.1	+0.9	0.0
15			0.0		
Final	-0.1 (6)	+0.7 (8)	0.0 (16)	+0.9 (10)	+0.1 (13)

Solution	Test 325 0.1mCl^-/T 1.0m NaCl p_wH 8.43
Time (min.)	
0	+2.3
1	+1.4
2	+1.2
5	+1.0
10	+0.8
Final	+0.8 (10)

Electrode No. 8 22/7/64 (2) Initial Standard Solution 0.1m HCl

Solution	Standard 0.01m HCl 1.0m NaCl	Test 326 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.01m HCl 1.0m NaCl (10 min.) 0.1m HCl	Test 327 0.1m Cl^-/T 1.0m NaCl p_wH 8.43
Time (min.)				
0	0.0	+2.4	-1.5	+4.1
1	0.0	+1.5	-0.7	+1.9
2	0.0	+1.3	-0.4	+1.5
5		+1.1	-0.2	+1.2
10		+1.0	0.0	
15			+0.1	
20			+0.1	
Final	0.0 (4)	+1.0 (10)	+0.1 (20)	+1.1 (8)

Electrode No. 8 24/7/64 Initial Standard Solution

0.1m HCl

Solution	Standard 0.1mCl^-/T p_wH 8.31	Test 331 0.1mCl^-/T 1.0m LiCl p_wH 8.48	Standard 0.1mCl^-/T p_wH 8.31	Test 332 0.1mCl^-/T 1.0m LiCl p_wH 9.27	Standard 0.1mCl^-/T p_wH 8.31
Time (min.)					
0	-0.3	0.0	-0.3	+0.5	-0.4
1	-0.1	+0.2	-0.1	+0.6	-0.2
2	0.0	+0.3	0.0	+0.6	-0.1
5	0.0	+0.3	0.0	+0.6	0.0
10					0.0
15					0.0
20					0.0
Final	0.0 (6)	+0.3 (7)	0.0 (5)	+0.6 (6)	0.0 (20)

Electrode No. 8 — 5/11/64 (1) — Initial Standard Solution 0.05m SO_4^{2-}/Tris

Solution	Standard 0.1m H_2SO_4 (5 min.) 1m H_2SO_4	Test 335 0.5m HCl	Standard 1m H_2SO_4
Time (min.)			
0	0.0	-4.2	+1.9
1	0.0	-2.3	+0.5
2	0.0	-1.9	+0.3
5	0.0	-1.6	+0.2
10	-0.1	-1.4	
15		-1.4	
20			+0.3
25			+0.3
Final	-0.1 (12)	-1.4 (16)	+0.3 (26)

Electrode No. 8 — 5/11/64 (2) — Initial Standard Solution 1.0m H_2SO_4

Solution	Test 336 0.1m HCl	Standard 1m H_2SO_4	Test 337 0.1m HCl	Standard 1m H_2SO_4	Test 338 0.5m HCl
Time (min.)					
0	-0.6	+0.1	-0.6	0.0	-4.1
1	-0.4	+0.1	-0.3	0.0	-2.3
2	-0.2	+0.1	-0.2	0.0	-1.9
5	-0.1	0.0	-0.1	0.0	-1.6
10					-1.6
15					
20					
Final	-0.1 (8)	0.0 (6)	-0.1 (7)	0.0 (6)	-1.6 (10)

Solution	Standard 1m H_2SO_4 (12 min.) 0.1m H_2SO_4	Test 339 0.1m HCl
Test (min.)		
0	+1.8	-0.8
1	+0.3	-0.5
2	+0.1	-0.3
5	0.0	-0.2
10	0.0	
15	0.0	
20	0.0	
Final	0.0 (22)	-0.1 (9)

Electrode No. 8 | 11/3/65 (1) | Initial Standard Solution 0.1m H_2SO_4

Solution	Standard $0.1mCl^-/T$ p_wH 8.63	Test 75 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.63	Standard $0.1mCl^-/T$ p_wH 8.63 ($\frac{1}{2}$ min.) 0.1m H_2SO_4	Test 76 0.5m HCl	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.3	+0.9	-0.1	-3.2	+2.3
1	-0.2	+1.0	0.0	-4.2	+0.8
2	-0.2	+1.1	+0.1	-3.6	+0.3
5	-0.2	+1.2	+0.1	-3,0	0.0
10		+1.2	+0.1	-2.9	0,0
15			+0.3		
Final	-0.2 (7)	+1.2 (10)	+0.3 (16)	-2.9 (11)	0.0 (12)

Electrode No. B 11/5/65 (1) (Cont.)

Solution	Test 77 0.5m HCl
Time (min.)	
0	-4.6
1	-4.5
2	-3.6
5	-3.0
10	-2.8
15	
Final	-2.8 (13)

Electrode No. 8 — 11/5/65 (2) — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard $0.1mCl^-/T$ p_wH 8.63	Test 78 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1mCl^-/E$ p_wH 8.63
Time (min.)			
0	+0.4	+3.5	-1.8
2	-0.1	+4.0	-1.5
2	0.0	+3.6	-1.1
5	0.0	+2.7	-0.6
10		+2.2	-0.2
15		+2.1	0.0
Final	0.0 (7)	2.0 (17)	0.0 (17)

Electrode No. 8 — 17/5/65 — Initial Standard Solution 0.1m HBr

Solution	Standard $0.1mCl^-/T$ p_wH 8.64	Test 82 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1mCl^-/T$ p_wH 8.64 Except:- 0.1m HBr (9-17 min)	Test 83 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.83	Standard $0.1mCl^-/T$ p_wH 8.64
Time (min.)					
0	-0.2	+0.9	-0.3	+1.0	-0.1
1	-0.1	+1.1	+0.3	+1.1	0.0
2	0.0	+1.2	+0.4	+1.2	0.0
5	0.0	+1.3	+0.4	+1.3	0.0
10		+1.5	+0.5	+1.4	
15		+1.6	+0.6		
20			+0.5		
Final	+0.1 (9)	+1.7 (18)	+0.6 (24)	+1.4 (10)	0.0 (8)

Electrode No. 8 — 1/6/65 (1) — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.24 (8 min.) 0.1m Cl^-/E p_wH 9.75	Standard 0.1m Cl^-/E p_wH 10.45	Test 359 0.1m Cl^-/E 1.0m KCl	Standard 0.1m Cl^-/E p_wH 9.75 (7 min.) 0.1m H_2SO_4
Time (min.)				
0	-1.0	-1.0	+2.6	-0.5
1	-0.1	-0.2	+2.5	+0.4
2	0.0	-0.1	+2.5	+0.5
5	0.0	-0.1	+2.5	+0.5
10	-0.1			+0.6
15	0.0			+0.6
Final	0.0 (15)	0.0 (8)	+2.6 (9)	+0.6 (15)

Electrode No. 8 — 1/6/65 (2) — Initial Standard Solution 0.1m H_2SO_4

Solution	Test 360 0.1m HCl	Standard 0.1m H_2SO_4	Standard 0.1mCl^-/E p_wH 9.75	Test 361 0.1mCl^-/E 1.0m KCl p_wH 10.09	Standard 0.1mCl^-/E p_wH 9.75
Time (min.)					
0	-2.6	+0.2	-0.6	+3.8	-1.4
1	-0.7	+0.1	0.0	+3.1	-0.4
2	-0.6	0.0	0.0	+2.8	-0.2
5	-0.3	0.0	0.0	+2.6	-0.1
10	-0.3			+2.5	
Final	-0.3 (10)	0.0 (9)	0.0 (7)	+2.5 (12)	-0.1 (9)

Electrode No. 8 — 14/6/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m HBr (7 min.) 0.1m Br^-/E p_wH 9.72	Test 101 0.1m Br^-/E 1.0m KBr p_wH 10.01 Except:- 0.1m Cl^-/E 1.0m KCl p_wH 10.09 (7-16 min)	Standard 0.1m Br^-/E p_wH 9.72	Standard 0.1m HBr (7 min.) 0.1m H_2SO_4 (7-15 min) 0.1m Br^-/E p_wH 9.72	Test 102 0.1m Br^-/E 1.0m KBr p_wH 10.01 (9 min.) 0.1m Cl^-/E 1.0m KCl p_wH 10.09
Time (min.)					
0	-0.2	+2.5	-0.2	-0.1	+3.3
1	-0.1	+2.3	+0.2	-0.1	+2.4
2	-0.1	+2.3	+0.3	-0.1	+2.3
5	-0.1	+2.3	+0.4	0.0	+2.3
10	-0.1	+2.4	+0.4	0.0	+2.3
15	-0.1	+2.5		0.0	+2.4
20		+2.4		-0.1	
25		+2.5			
Final	-0.1 (15)	+2.5 (25)	+0.6 (35)	-0.1 (23)	+2.4 (18)

Electrode No. 8 14/6/65 (Cont.)

Solution	Test 103*	Test 102	Standard	Test 104	Standard
	$0.1mCl^-/E$ 1.0m KCl p_wH 10.56	$0.1mCl^-/E$ 1.0m KCl p_wH 10.09 (8 min.) $0.1mBr^-/E$ 1.0m KBr p_wH 10.01	$0.1m H_2SO_4$	$0.1mCl^-/E$ 1.0m KCl p_wH 10.56	$0.1m H_2SO_4$
Time (min.)					
0	+4.3	+2.0	+0.2	+5.9	-0.4
1	+4.1	+2.4	+0.4	+4.4	0.0
2	+4.1	+2.5	+0.5	+4.1	0.0
5	+4.1	+2.6	+0.5	+3.8	+0.1
10		+2.5		+3.8	
15		+2.6			
Final	+4.1 (9)	+2.6 (16)	+0.5 (7)	+3.8 (11)	+0.1 (8)

*Test 103: Errors are given relative to the final e.m.f. in the previous standard solution $0.1mBr^-/E$ p_wH 9.72

Electrode No. 8 14/6/65 (Cont.)

Solution	Test 105 $0.1m Cl^-/E$ 1.0m KCl p_wH 10.09	Standard 0.1m H_2SO_4 (8 min.) 0.1m HBr (8-17 min) $0.1m Br^-/E$ p_wH 9.72	Test 106 $0.1m Br^-/E$ 1.0m KBr p_wH 10.01	Standard $0.1m Br^-/E$ p_wH 9.72 (11 min.) 0.1m HBr	Test 107 $0.1m Br^-/E$ 1.0m KBr p_wH 10.01
Time (min.)					
0	+3.7	-0.3	+3.9	-0.9	+5.3
1	+2.6	+0.1	+2.8	-0.2	+3.5
2	+2.4	+0.1	+2.7	-0.1	+3.1
5	+2.3	+0.1	+2.4	0.0	+2.7
10	+2.3	0.0	+2.4	0.0	+2.6
15	+2.3	0.0		-0.1	
20		0.0			
25		0.0			
Final	+2.3 (40)	0.0 (25)	+2.4 (10)	0.0 (19)	+2.6 (12)

Electrode No. 8 14/6/65 (Cont.)

Solution	Standard 0.1m HBr Except:- 0.1mBr^-/E p_wH 9.72 (10-18 min)
Time (min.)	
0	-1.1
1	-0.3
2	-0.1
5	0.0
10	0.0
15	+0.1
20	-0.1
25	-0.1
Final	-0.1 (26)

Electrode No. 8 — 18/6/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1mBr^-/E p_wH 9.75 (8 min.) 0.1mCl^-/E p_wH 10.34	Test 110 0.1mCl^-/E 1.0m KCl p_wH 10.56	Standard 0.1mCl^-/E p_wH 10.34	Test 111 0.1mCl^-/E 2.0m KCl p_wH 10.65	Standard 0.1mCl^-/E p_wH 10.34 (9 min.) 0.1m H_2SO_4
Time (min.)					
0	0.0	+5.2	-0.5	+6.7	-0.7
1	+0.1	+4.3	+0.2	+5.8	0.0
2	+0.2	+4.2	+0.2	+5.6	+0.2
5	+0.2	+4.2	+0.2	+5.4	+0.2
10	0.0			+5.4	+0.3
15	0.0				+0.4
Final	0.0 (16)	+4.2 (9)	+0.2 (7)	+5.4 (12)	+0.4 (17)

Electrode No. 8 — 10/8/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 9.41	Test 136 0.1mCl^-/E +1m NaCl p_wH 9.85	Standard 0.1mCl^-/E p_wH 9.41	Test 137 0.1mCl^-/E +1m NaCl p_wH 10.49	Standard 0.1mCl^-/E p_wH 9.41
Time (min.)					
0	0.0	+4.7	+0.6	+11.5	+1.1
1	0.0	+4.9	+0.6	+12.0	+1.0
2	0.0	+5.0	+0.6	+12.2	+0.9
5	0.0	+5.3	+0.5	+12.6	+0.6
10		+5.6		+12.9	+0.5
15				+13.1	
20					
25					
					+0.4 (30)
Final	0.0 (7)	+5.6 (12)	+0.4 (8)	+13.2 (19)	+0.4 (37)

Electrode No. 8 10/8/65 (Cont.)

Solution	Test 138 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m Cl^-/E p_wH 9.41 (7 min.) 0.1m H_2SO_4	Test 139 0.1m Cl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1m H_2SO_4
Time(Min.)				
0	+2.7	-0.1	+4.8	+0.3
1	+2.8	+0.3	+4.9	+0.3
2	+2.8	+0.3	+5.0	+0.3
5	+2.9	+0.2	+5.2	+0.2
10	+3.0	+0.1	+5.4	+0.1
15		+0.1		
Final	+3.0 (10)	+0.1 (15)	+5.5 (13)	+0.1 (10)

Electrode No. 8 14/4/66 Initial Standard Solution

$0.1mCl^-/T$ p_wH 8.68

Solution	Standard $0.1m\ H_2SO_4$	Test 203 1.0m HCl	Test 204 0.1m HCl	Standard $0.1m\ H_2SO_4$ Except:- $0.1mCl^-/T$ p_wH 8.68 (10-20 min)	Test 205 0.1m HCl
Time (min.)					
0	+0.2	-12.3	+7.2	+3.7	-5.8
1	0.0	-17.4	+1.0	+0.5	-1.3
2	0.0	-15.9	+0.2	+0.4	-1.0
5	+0.1	-14.6	-0.2	+0.3	-0.6
10		-14.1	-0.3		-0.5
15		-13.9		+0.3	-0.5
20		-13.9		+0.3	
25				+0.3	
Final	+0.1 (8)	-13.9 (20)	-0.3 (13)	+0.3 (29)	-0.5 (15)

Electrode No. 8 5/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.01	Test 213 0.1m Cl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1m Cl^-/E p_wH 10.01	Test 214 0.1m Cl^-/E 0.1m NaCl p_wH 10.31	Standard 0.1m Cl^-/E p_wH 10.01
Time (min.)					
0	0.0	+13.5	+1.9	+3.6	+0.2
1	-0.2	+14.0	+1.7	+3.4	+0.2
2	-0.1	+14.4	+1.5	+3.5	+0.2
5	-0.1	+15.0	+1.3	+3.6	+0.1
10		+15.3	+1.2		
15		+15.6			
		+17.2 (85)			
Final	-0.1 (8)	+17.2 (91)	+1.2 (12)	+3.6 (8)	+0.1 (7)

Electrode No. 8 3/8/66. Initial Standard Solution

Acetate Buffer + 2m $MgSO_4$

Solution	Test 218 Borax 1.0m Na^+ p_wH 9.16	Standard Acetate 1.0m Na^+ p_wH 4.75	Test 219* Acetate 0.1m F^- Approx. p_wH 4.8	Standard Acetate 1.0m Na^+ p_wH 4.75	Test 220 Borax 1.0m Na^+ p_wH 9.16
Time (min.)					
0	+2.1	-0.4	-3.7	-1.9	+6.5
1	+2.1	+0.1	-4.5	-0.4	+5.5
2	+2.1	+0.1	-4.4	-0.3	+4.6
5	+2.1	+0.1	-4.3	-0.2	+3.6
10			-4.2		+3.3
15					+3.0
20					+3.0
Final	+2.1 (8)	+0.1 (8)	-4.2 (10)	-0.1 (9)	+3.0 (23)

* On account of the instability of the potential of the hydrogen electrode for this solution these are observed rather than true values. They have been included to indicate the time variation of the glass electrode potential (See Chapter 9).

Solution	Standard Acetate 1.0m Na^+ p_wH 4.75 (23 min.) 0.1m H_2SO_4
Time (min.)	
0	-4.7
1	-3.2
2	-2.1
5	-0.8
10	-0.2
15	0.0
20	+0.1
25	+0.2
30	+0.2
Final	+0.2 (31)

Electrode No. 8 — 17/8/66 (1) — Initial Standard Solution 0.5mCl^-/E p_wH 9.93

Solution	Standard 0.1m H_2SO_4 (7 min.) Acetate 1.0m K^+	Test 229 0.1mCl^-/T 1.0m KCl p_wH 9.13	Standard Acetate 1.0m K^+ (9 min.) 0.5mCl^-/E p_wH 9.93	Test 230 0.1mCl^-/E 1.0m KCl p_wH 10.05	Standard 0.5mCl^-/E p_wH 9.93 (7 min.) 0.1m H_2SO_4
Time (min.)					
0	0.0	+1.0	-0.2	+3.9	-0.5
1	+0.1	+0.8	-0.1	+3.2	0.0
2	+0.1	+0.8	0.0	+3.1	+0.1
5	+0.1	+0.8	0.0	+3.1	+0.1
10	+0.1		-0.1		+0.1
15			-0.1		
Final	+0.1 (14)	+0.8 (7)	-0.1 (16)	+3.1 (8)	+0.1 (14)

Electrode No. 8 17/8/66 (1) (Cont.)

Solution	Test 231 0.5m HCl	Standard 0.1m H_2SO_4 (38 min.) 0.5m Cl^-/E p_wH 9.93	Test 232 0.1m Cl^-/E 1.0m KCl p_wH 10.05	Standerd 0.5m Cl^-/E p_wH 9.93
Time (min.)				
0	-14.4	+3.1	+6.0	-0.9
1	-10.3	0.0	+5.4	-0.4
2	- 9.1	-0.2	+5.2	-0.3
5	- 8.4	-0.3	+5.1	-0.3
10	- 8.2	-0.3	+4.8	-0.2
15	- 8.2		+4.7	
20	- 8.2			
25				
30		0.0		
35		0.0		
40		-0.1		
45		-0.1		
Final	-8.2 (20)	-0.1 (45)	+4.7 (16)	-0.2 (13)

Electrode No. 8 — 17/8/66 (2) — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/E p_wH 9.93	Test 347 0.1m Cl^-/E 1.0m KCl p_wH 10.05	Standard 0.5m Cl^-/E p_wH 9.93	Test 348 0.1m Cl^-/T 1.0m KCl p_wH 9.13	Standard 0.5m Cl^-/E p_wH 9.93 (6 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.2	+4.8	-0.3	+1.5	-0.5
1	-0.1	+4.2	0.0	+1.3	0.0
2	0.0	+4.1	+0.1	+1.3	0.0
5	0.0	+4.0	+0.1	+1.3	0.0
10					0.0
Final	0.0 (7)	+4.0 (8)	+0.1 (7)	+1.3 (7)	0.0 (13)

Electrode No. 9. Jena H

This electrode was conditioned and stored in deionised water and tested in certain standard solutions between May 1964 and May 1965. However, the observed e.m.f's. were erratic and the electrode was withdrawn, stored dry, and subsequently remounted in the manner described in section 4.4.

8/10/65 Mounted and placed in deionised water.

				E_7
12/11/65	Sodium Solution	1.0m	p_wH 10.04	0.371
22/12/65	HBr	5.0m		0.381
	Sodium Solution	1.0m	p_wH 9.84	
	Lithium Solution	1.0m	p_wH 10.74	
24/4/66	Sodium Solution	1.0m	p_wH 10.55	0.400

Resistance 90 Megohms.

Electrode No. 9 12/11/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.94	Test 239 0.1m Cl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1m Cl^-/E p_wH 9.94 (8 min.) 0.1m H_2SO_4
Time (min.)			
0	+0.4	+5.2	-0.5
1	+0.1	+5.2	-0.1
2	0.0	+5.2	0.0
5	0.0	+5.2	+0.1
10			+0.1
15			+0.1
Final	0.0 (7)	+5.2 (7)	+0.1 (15)

Electrode No. 9 | 22/12/65 (1) | Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.83	Test 188 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m Cl^-/E p_wH 9.83	Test 189 0.1m Cl^-/E 1.0m NaCl p_wH 9.84	Standard 0.1m H_2SO_4
Time (min.)					
0	0.0	+3.3	-0.2	+4.1	0.0
1	+0.1	+2.8	-0.1	+4.2	-0.1
2	+0.1	+2.9	0.0	+4.2	0.0
5	+0.2	+3.0	0.0	+4.4	+0.1
10		+3.1	0.0	+4.5	
Final	+0.2 (9)	+3.1 (10)	0.0 (11)	+4.5 (12)	+0.1 (8)

Electrode No. 9 22/12/65 (1) (Cont.)

Solution	Test 190 0,1mCl⁻/E 1.0m NaCl p_wH 9.84	Standard 0.1mCl⁻/E p_wH 9.83
Time (min.)		
0	+4.2	-0.4
1	+4.3	-0.3
2	+4.3	-0.2
5	+4.4	-0.1
10	+4.5	0.0
Final	+4.5 (10)	0.0 (10)

Electrode No. 9 22/12/65 (2) Initial Standard Solution 0.1m H_2SO_4

Solution	Test 191 5.0m HBr	Standard 0.1m H_2SO_4 (9 min.) 0.1m Cl^-/E p_wH 8.83	Test 192 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m Cl^-/E p_wH 9.83
Time (min.)				
0	-3.5	+1.9	+7.5	-3.8
1	-10.4	+0.3	+6.3	-1.5
2	-12.8	0.0	+5.7	-0.9
5	-14.2	-0.2	+5.2	-0.3
10	-14.2	0.0	+4.9	0.0
15		0.0	+4.7	0.0
Final	-14.2 (13)	0.0 (17)	+4.6 (17)	0.0 (16)

Electrode No. 9 22/4/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/T p_wH 8.68	Test 207 0.1m Cl^-/T 1.0m NaCl p_wH 9.04	Standard 0.1m Cl^-/T p_wH 8.68	Test 208 0.1m Cl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1m Cl^-/T p_wH 8.68 Except:- 0.1m H_2SO_4 (10-19 min)
Time (min.)					
0	-0.4	-4±1	-2.3	+10.6	-1.6
1	0.0	+1.2	-0.1	+10.6	+0.1
2	0.0	+1.3	0.0	+10.7	+0.2
5	0.0	+1.3	0.0	+10.9	+0.3
10				+11.1	
15				+11.2	+0.4
20				+11.3	+0.4
25					+0.4
Final	0.0 (8)	+1.3 (9)	+0.1 (9)	+11.3 (20)	+0.3 (60)

Electrode No. 9 22/4/66 (Cont.)

Solution	Test 209 0.1m Cl^-/T 0.1m NaCl p_wH 10.31	Standard 0.1m Cl^-/T p_wH 8.68	Test 210 0.01m HCl 1.0m NaCl
Time (min.)			
0	+2.2	-0.4	-0.5
1	+2.1	-0.2	-0.3
2	+2.2	-0.2	-0.2
5	+2.2	-0.2	-0.1
Final	+2.2 (8)	-0.2 (8)	-0.1 (7)

Electrode No. 10. Pye Ingold.

28/5/65	Mounted and placed in deionised water.			
				E_7
1/6/65 to 13/7/65	Potassium Solution	1.0m	p_wH 10.09	0.345
		2.0m	p_wH 10.65	
30/7/65 to 5/8/65	HCl	1.0m		0.345
	Sodium Solution	1.0m	p_wH 10.49	
25/11/65	HCl	0.5m		0.346
14/9/66	$MgSO_4$	1.85m	p_wH 8.43	0.347
	Lithium Solution	1.0m	p_wH 12.81	
	Sodium Solution	1.0m	p_wH 13.00	
Resistance	270 Megohms.			

Electrode No. 10 30/7/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5m HCl (12 min.) 0.1m H_2SO_4	Standard 1.0m HCl	Standard 0.1m H_2SO_4	Test 64 0.1m Cl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1m H_2SO_4
Time (min.)					
0	-1.0	-2.1	+5.0	+2.3	-1.0
1	-0.4	-0.5	+0.3	+1.2	-0.9
2	-0.3	-0.4	+0.1	+1.0	-0.6
5	-0.1	-0.2	+0.2	+0.9	-0.2
10	-0.1	-0.1	+0.1	+0.8	0.0
15	-0.2				
20	-0.2				
				+0.8 (30)	
Final	-0.2 (24)	-0.1 (13)	+0.1 (11)	+0.8 (37)	0.0 (13)

Electrode No. 10 30/7/65 (Cont.)

Solution	Standard 0.1mCl^-/E p_wH 10.08
Time (min.)	
0	+0.4
1	-0.4
2	-0.4
5	-0.2
10	-0.1
15	-0.1
Final	-0.1 (16)

Electrode No. 10 4/8/65 Initial Standard Solution

$0.1mCl^-/E$ p_wH 9.41

Solution	Standard $0.1mCl^-/E$ p_wH 10.08	Test 65 $0.1mCl^-/E$ 1.0m NaCl p_wH 10.49	Standard $0.1mCl^-/E$ p_wH 10.08 (9 min.) $0.1m\ H_2SO_4$
Time (min.)			
0	0.0	+3.8	-1.5
1	+0.1	+2.6	-0.5
2	+0.2	+2.4	-0.3
5	+0.2	+2.1	-0.5
10	-0.1	+1.8	-0.6
15			-0.3
Final	-0.1 (10)	+1.8 (10)	-0.3 (18)

Electrode No. 10 5/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/T p_wH 8.91	Standard 0.1m Cl^-/E p_wH 10.08	Test 68 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 10.08	Standard 0.1m H_2SO_4 (12 min.) 0.1m Cl^-/T p_wH 8.91
Time (min.)					
0	+0.2	-0.4	+3.4	-2.0	0.0
1	-0.1	-0.5	+2.7	-1.0	0.0
2	0.0	-0.4	+2.5	-0.7	0.0
5	+0.1	-0.3	+2.3	-0.4	+0.2
10			+2.1	-0.3	+0.3
15			+2.0	-0.3	+0.4
20			+1.9	-0.2	+0.4
Final	+0.1 (9)	-0.3 (8)	+1.9 (23)	-0.2 (24)	+0.4 (20)

Electrode No. 10 14/9/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15	Test 29 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/T p_wH 8.15	Test 30 0.1m LiOH 0.9m LiCl p_wH 12.81	Standard 0.5m Cl^-/T p_wH 8.15
Time (min.)					
0	+0.5	+35.0	-7.2	+30.1	-5.9
1	0.0	+32.1	-3.8	+28.8	-2.6
2	0.0	+31.1	-2.9	+28.1	-1.5
5	+0.1	+29.7	-1.8	+27.1	-0.5
	+0.1 (7)				
10		+28.9	-1.3	+26.3	0.0
					+0.1 (13)
15		+28.4	-1.1	+25.8	
			-1.0 (18)		
20		+28.2		+25.5	
25		+27.9			
30		+27.8			
35		+27.6	-0.9		
40		+27.5	-0.9	+24.9	
45		+27.4			+0.3
	+0.1 (60)			+24.7 (65)	
		+26.2 (80)			
		+26.1 (85)		+24.6 (90)	
		+25.7 (120)			
Final	+0.1 (65)	+25.7 (124)	-0.9 (40)	+24.6 (97)	+0.3 (50)

Electrode No. 10. 14/9/66 (Cont.)

Solution	Standard 1.85m $MgSo_4$ p_wH 8.43
Time (min.)	
0	-2.6
1	-0.1
2	0.0
5	0.0
Final	0.0 (6)

Electrode No. 11. E.I.L. GHS 33

				E_7
2/6/65	Mounted and placed in deionised water			
18/6/65 and 13/7/65	Potassium Solution	1.0m	p_wH 10.65	0.356 to 0.353
		2.0m	p_wH 10.65	
30/7/65	HCl	1.0m		0.353
	Sodium Solution	1.0m	p_wH 9.85	

Resistance not measured.

Electrode No. 12. E.I.L. GG 33

				E_7
20/7/64	Mounted and placed in deionised water			
21/7/64 and 22/7/64	HCl	0.1m + 1.0m NaCl		0.389
	Sodium Solution	1.0m	p_wH 8.43	0.386
26/8/64	HCl	0.1m		0.388
9/11/64	HCl	0.5m		0.387
29/4/65	HCl	0.1m		0.388
13/7/65	Potassium Solution	1.0m	p_wH 10.54	0.389
4/11/65	HCl	1.0m		0.392
	Sodium Solution	1.0m	p_wH 13.00	
12/11/65	HCl	0.5m		0.392
	Sodium Solution	1.0m	p_wH 10.04	
21/12/65	HBr	5.0m		0.393
	Lithium Solution	1.0m	p_wH 10.74	
	Sodium Solution	1.0m	p_wH 9.84	
10/8/66	Sodium Solution	1.0m	p_wH 9.16	0.398
17/8/66	HCl	0.5m		0.398
	Potassium Solution	1.0m	p_wH 10.05	

Resistance 120 Megohms.

Electrode No. 12 21/7/64 Initial Standard Solution 0.1m HCl

Solution	Standard 0.01m HCl 1.0m NaCl	Test 321 0.1m HCl 1.0m NaCl	Standard 0.01m HCl 1.0m NaCl	Test 322 $0.1mCl^-/T$ 1.0m NaCl p_wH 8.43	Standard 0.1m HCl
Time (min.)					
0	+1.3	+0.1	+1.5	+6.0	-0.4
1	0.0	-0.7	+0.1	+3.1	-1.2
2	0.0	-0.7	0.0	+2.5	-0.8
5	0.0	-0.7	0.0	+2.0	-0.3
10				+1.9	-0.1
15				+1.8	
Final	0.0 (6)	-0.7 (8)	+0.1 (6)	+1.8 (16)	0.0 (14)

Electrode No. 12 22/7/64 Initial Standard Solution 0.1m HCl

Solution	Standard 0.01m HCl 1.0m NaCl	Test 328 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.01m HCl 1.0m NaCl (9 min.) 0.1m HCl	Test 329 0.1m Cl^-/T 1.0m NaCl p_wH 8.43	Standard 0.1m HCl
Time (min.)					
0	+0.3	+2.9	-1.3	+3.8	-1.6
1	+0.1	+1.8	-0.8	+2.2	-1.0
2	0.0	+1.7	-0.5	+1.9	-0.7
5	0.0	+1.5	-0.3	+1.6	-0.4
10		+1.4	-0.2	+1.5	-0.3
15					
20					
25					
Final	0.0 (5)	+1.4 (11)	-0.1 (14)	+1.5 (13)	-0.3 (12)

Electrode No. 12 22/7/64 (Cont.)

Solution	Test 330 0,1mCl⁻/T 1,0m NaCl p_wH 8,43
Time (min.	
0	+4,1
1	+2,5
2	+2,1
5	+1,8
10	
Final	+1,8 (8)

Electrode No. 12 — 9/11/64 (1) — Initial Standard Solution 0.05m SO_4^{2-}/Tris.

Solution	Standard 0.1m H_2SO_4	Test 343 0.5m HCl	Standard 0.1m H_2SO_4	Test 344 0.1m HCl	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.1	-10.0	+2.6	-1.7	+0.6
1	0.0	- 5.3	+0.3	-0.9	0.0
2	+0.1	- 4.3	+0.1	-0.6	0.0
5	+0.1	- 3.4	-0.1	-0.4	0.0
10		- 3.0	-0.1	-0.3	
15		- 3.0			
Final	+0.1 (6)	-3.0 (40)	-0.1 (10)	-0.3 (10)	0.0 (7)

Electrode No. 12 9/11/64 (2) Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.05m SO_4^{2-} Tris (9 min.) 0.1m H_2SO_4	Test 345 0.1m HCl	Standard 0.05m SO_4^{2-} Tris (10 min.) 0.1m H_2SO_4
Time (min.)			
0	-0.6	-1.4	-0.2
1	-0.4	-1.2	-0.1
2	-0.3	-0.7	0.0
5	-0.1	-0.4	+0.1
10		-0.2	+0.1
15	0.0		+0.1
Final	0.0 (17)	-0.2 (13)	+0.1 (18)

Electrode No. 12 13/7/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1mBr^-/E p_wH 9.75	Test 112 0.1mBr^-/E 1.0m KBr p_wH 10.01	Standard 0.1mBr^-/E p_wH 9.75	Test 113 0.1mCl^-/E 1.0m KCl p_wH 10.54	Standard 0.1mH_2SO_4
Time (min.)					
0	-0.3	+4.0	-0.2	+6.8	-0.5
1	-0.2	+3.4	+0.3	+5.6	+0.1
2	-0.1	+3.4	+0.4	+5.5	+0.2
5	-0.1	+3.4	+0.4	+5.4	+0.3
10					
15					
Final	-0.1 (6)	+3.5 (8)	+0.4 (8)	+5.4 (7)	+0.3 (8)

Electrode No. 12 13/7/65 (Cont.)

Solution	Test 114 0.1m Br^-/E 1.0m KBr p_wH 10.01	Standerd 0.1m H_2SO_4	Test 115 0.1m Cl^-/E 1.0m KCl p_wH 10.54	Standard 0.1m H_2SO_4
Time (min.)				
0	+4.4	-1.0	+6.8	+0.4
1	+3.2	-0.1	+5.6	+0.7
2	+3.1	0.0	+5.4	+0.8
5	+3.0	0.0	+5.2	+0.8
10			+5.2	
Final	+3.0 (8)	0.0 (8)	+5.9 (2 hours)	+0.8 (6)

Electrode No. 12 4/11/65 Initial Standard Solution 1.0m H_2SO_4

Solution	Standard 0.1m H_2SO_4	Test 156 0.1m Cl^-/E 1.0m NaCl p_wH 10.04	Standard 1.0m H_2SO_4	Test 157 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m H_2SO_4 (32 min.) 1.0m H_2SO_4
Time (min.)					
0	+0.7	+8.2	-0.5	+102.2	-1.6
1	0.0	+8.5	+0.1	+102.2	-1.0
2	0.0	+8.7	+0.3	+102.7	-0.9
5	+0.1	+9.0	+0.3	+103.6	-0.7
10		+9.2		+104.5	-0.4
15		+9.4		+105.0	-0.1
20				+105.5	+0.1
25				+105.8	+0.3
30				+106.1	+0.4
35					+0.4
40					+0.5
				+106.9 (50)	
Final	+0.2 (7)	+9.5 (18)	+0.3 (9)	+107.3 (60)	+0.5 (41)

Electrode No. 12 4/11/65 (Cont.)

Solution	Test 158 1.0m HCl	Standard 1.0m H_2SO_4	Test 159 0.1m Cl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1m H_2SO_4	Test 160 0.1m NaOH 0.9m NaCl P_wH 13.00
Time (min.)					
0	-36±1	-4.1	+16.9	-5.6	+119.5
1	-25.5	-3.6	+17.7	-5.3	+119.9
2	-24.9	-3.1	+17.4	-4.7	+119.1
5	-25.5	-2.4	+16.0	-3.1	+117.4
10	-26.8	-1.8	+14.8	-1.9	+116.4
15	-27.6	-1.5	+14.3	-1.3	+115.9
20	-28.1		+13.9	-0.9	+115.6
25	-28.3		+13.6		+115.4
30	-28.4				
35		-0.8			
40		-0.7			
45		-0.6			
Final	-28.4 (30)	-0.5 (48)	+13.5 (28)	-0.4 (45)	+115.4 (26)

Electrode No. 12 4/11/65 (Cont.)

Solution	Standard 0.1m H_2SO_4 (41 min.) 0.1mCl^-/E p_wH 10.38
Time (min.)	
0	-7.3
1	-8.2
2	-7.4
5	-5.2
10	-3.2
15	-2.2
20	-1.5
25	-1.1
30	-0.7
35	-0.5
40	-0.3
45	-0.4
Final	-0.3 (50)

Electrode No. 12 — 12/11/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 1.0m H_2SO_4 (9 min.) 0.1m H_2SO_4	Test 161 0.1m Cl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1m H_2SO_4	Test 162 0.5m HCl	Standard 1.0m H_2SO_4
Time (min.)					
0	+0.1	+8.8	-0.6	-14.8	+0.7
1	0.0	+9.2	+0.1	-11.0	-1.0
2	0.0	+9.4	+0.1	-10.6	-1.0
5	0.0	+9.8	0.0	-10.5	-0.9
10		+9.9		-10.4	-0.7
15	+0.1	+10.1			
20		+10.1			
Final	+0.1 (17)	+10.1 (20)	0.0 (8)	-10.4 (11)	-0.4 (3 hours)

Electrode No. 12 12/11/65 (Cont.)

Solution	Standard 0.1m H_2SO_4 (7 min.) 0.1mCl^-/E p_wH 9.94	Test 163 0.1mCl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1m H_2SO_4
Time (min.)			
0	-1.0	+11.2	-1.6
1	0.0	+12.1	-1.5
2	0.0	+12.1	-1.2
5	0.0	+11.9	-0.9
10	+0.1	+11.6	-0.6
15	+0.1	+11.5	
Final	+0.1 (15)	+11.5 (16)	-0.5 (12)

Electrode No. 12 21/12/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 9.83	Test 179 0.1mCl^-/E +1.0m NaCl p_wH 9.84	Standard 0.1mCl^-/E p_wH 9.83	Test 180 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1mCl^-/E p_wH 9.83 (9 min.) 0.1m H_2SO_4
Time (min.)					
0	-0.2	+7.1	+0.3	+5.3	-0.1
1	-0.1	+7.2	+0.3	+5.4	+0.4
2	0.0	+7.4	+0.4	+5.5	+0.5
5	0.0	+7.6	+0.3	+5.7	+0.4
10		+7.9	+0.2	+5.8	+0.3
15		+8.1			+0.3
Final	0.0 (7)	+8.1 (18)	+0.2 (10)	+5.9 (13)	+0.2 (19)

Electrode No. 12 21/12/65 (Cont.)

Solution	Standard 0.1m Cl^-/T p_wH 8.76 (7 min.) 0.1m H_2SO_4	Test 181 5.0m HBr	Standard 0.1m H_2SO_4 (12 min.) 0.1m Cl^-/E p_wH 9.83	Test 182 0.1m Cl^-/E +1.0m NaCl p_wH 9.84	Standard 0.1m Cl^-/E p_wH 9.83
Time (min)					
0	+0.2	-81±1	+8±2	+20.5	-11.7
1	-0.1	-68.2	-0.6	+16.9	- 7.2
2	-0.1	-61.8	-1.3	+15.2	- 5.0
5	-0.1	-55.2	-1.4	+13.3	- 2.6
10	0.0	-52.2	-1.2	+12.2	- 1.3
15		-51.3	-1.1	+11.7	- 0.7
20		-50.8	-1.0	+11.4	- 0.4
25				+11.2	- 0.2
30				+11.0	- 0.1
Final	0.0 (14)	-50.2 (50)	-1.0 (22)	+11.0 (31)	-0.1 (31)

Electrode No. 12 21/12/65 (Cont.)

Solution	Test 183 $0.1m Cl^-/E$ $0.5m Li_2SO_4$ p_wH 10.74	Standard $0.1m Cl^-/E$ p_wH 9.83
Time (min.)		
0	+6.4	- 2.1
1	+9.3	-2.7
2	+9.7	-2.0
5	+9.5	-0.9
10	+9.1	-0.2
15	+8.9	+0.1
20	+8.8	+0.2
25	+8.7	
Final	+8.6 (28)	+0.3 (24)

Electrode No. 12 10/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.29	Test 225 0.1m Cl^-/T 1.0m NaCl p_wH 9.14	Standard 0.1m Cl^-/E p_wH 10.29	Test 226 Borax 1.0m Na^+ p_wH 9.16	Standard 0.1m Cl^-/E p_wH 10.29
Time (min.)					
0	-0.3	+3.1	-1.1	+3.4	-0.8
1	-0.1	+3.1	0.0	+3.3	0.0
2	0.0	+3.1	+0.1	+3.2	+0.1
5	0.0	+3.2	+0.1	+3.2	+0.1
10				+3.2	
Final	0.0 (7)	+3.2 (8)	+0.1 (9)	+3.2 (10)	+0.1 (7)

Electrode No. 12 10/8/66 (Cont.)

Solution	Test 227 Borax 1.0m Na^+ p_wH 9.16	Standard 0.1m Cl^-/E p_wH 10.29 (8 min.) 0.1m H_2SO_4	Test 228 0.1m Cl^-/T 1.0m NaCl p_wH 9.14	Standard 0.1m H_2SO_4
Time (min.)				
0	+3.0	-1.4	+2.7	-0.9
1	+3.2	-0.2	+3.3	-0.3
2	+3.2	0.0	+3.3	-0.2
5	+3.2	0.0	+3.3	-0.1
10	+3.2	-0.1		
15		-0.1		
Final	+3.2 (11)	-0.1 (15)	+3.3 (7)	0.0 (8)

Electrode No. 12 17/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5mCl^-/E (7 min.) Acetate 1.0m K^+	Test 236 0.1mCl^-/E 1.0m KCl p_wH 10.05	Standard Acetate 1.0m K^+ (7 min.) 0.5mCl^-/E p_wH 9.93	Test 237 0.5m HCl	Standard 0.1m H_2SO_4 (10 min.) 0.5mCl^-/E p_wH 9.93
Time (min.)					
0	-0.3	+7.3	-1.4	-6.0	+2.5
1	-0.1	+5.2	0.0	-9.0	+0.1
2	-0.1	+5.0	+0.1	-11.5	-0.2
5	-0.1	+4.8	+0.1	-12.9	-0.4
10	-0.1		+0.1		-0.3
15					-0.2
Final	-0.1 (13)	+4.8 (9)	+0.1 (13)	-12.8 (9)	-0.2 (17)

Electrode No. 12 17/8/66 (Cont.)

Solution	Test 238 0.1mCl^-/E 1.0m KCl p_wH 10.05	Standard 0.5mCl^-/E p_wH 9.93
Time (min.)		
0	+13.5	-4.0
1	+10.9	-2.3
2	+10.2	-1.9
5	+ 9.4	-0.3
10	+ 8.5	+0.1
15	+8.0	
20		
25	+ 7.3	
30	+ 7.2	
Final	+7.2 (30)	+0.1 (10)

Electrode No. 14. E.I.L. GG 33.

7/5/65	Mounted and placed in triple distilled water.			
				E_7
11/5/65 to 21/5/65	HCl Sodium Solution	0.5m 1.0m	p_wH 8.83	0.381 to 0.383
22/5/65	Placed in deionised water			
14/6/65	Potassium Solution	1.0m	p_wH 10.56	0.382
14/6/66	HCl	1.0m after remounting:-		0.379 0.375

Resistance 95 Megohms.

Electrode No. 14 — 11/5/66 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/T p_wH 8.63	Test 353 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.63	Test 354 0.5m HCl	Standard 0.1m H_2SO_4 (10 min.) 0.1m Cl^-/T p_wH 8.63
Time (min.)					
0	-0.3	+1.3	-0.7	-0.7	+0.2
1	-0.5	+0.8	-0.4	-0.6	-0.1
2	-0.4	+0.8	-0.2	-0.5	0.0
5	-0.1	+1.0	0.0	-0.3	+0.2
10	-0.1	+1.0	+0.1	-0.3	+0.2
15		+1.0		-0.3	+0.1
20					+0.2
				-0.1 (35)	
Final	-0.1 (12)	+1.0 (17)	+0.1 (11)	-0.1 (41)	+0.2 (21)

Electrode No. 14 19/5/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 1.0m H_2SO_4	Standard 0.1m Cl^-/T p_wH 8.63	Test 355 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m Cl^-/T p_wH 8.63 (9 min.) 1.0m H_2SO_4 (9-16 min) 0.1m H_2SO_4	Test 356 0.5m HCl
Time (min.)					
0	-0.3	-0.4	+0.7	-0.3	-0.6
1	-0.5	-0.3	+0.6	-0.2	-0.3
2	-0.3	-0.2	+0.8	-0.1	-0.3
5	-0.1	-0.1	+1.1	0.0	-0.2
10	-0.1		+1.2	0.0	
15				+0.1	
20				+0.1	
25				+0.1	
Final	-0.1 (10)	-0.1 (9)	+1.2 (12)	+0.1 (25)	-0.2 (8)

Electrode No. 14 21/5/65 Initial Standerd Solution 0.1m HBr

Solution	Standard 0.1m Cl^-/T p_wH 8.64	Test 357 0.1m Cl^-/T 1.0m NaCl p_wH 8.83	Standard 0.1m HBr	Test 358 0.5m HCl	Standard 0.1m HBr
Time (min.)					
0	-0.3	+1.0	-0.7	-0.5	-0.2
1	-0.3	+1.0	-0.4	-0.6	-0.3
2	-0.2	+1.0	-0.3	-0.5	-0.2
5	0.0	+1.1	-0.1	-0.4	-0.1
10		+1.1	0.0	-0.4	
Final	0.0 (9)	+1.1 (10)	0.0 (12)	-0.4 (10)	-0.1 (8)

Electrode No. 14 14/6/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m HBr	Standard 0.1m Br^-/E p_wH 9.72	Test 363 0.1m Br^-/E 1.0m KBr p_wH 10.01	Standard 0.1m Br^-/E p_wH 9.72	Standard 0.1m HBr (9 min.) 0.1m H_2SO_4
Time (min.)					
0	0.0	+0.2	+1.4	+0.2	-0.2
1	+0.1	+0.4	+1.4	+0.4	-0.2
2	+0.1	+0.4	+1.4	+0.5	-0.1
5	0.0	+0.4	+1.4	+0.6	-0.1
10					0.0
15					+0.1
Final	0.0 (9)	+0.4 (8)	+1.5 (8)	+0.6 (9)	+0.1 (17)

Electrode No. 14 14/6/65 (Cont.)

Solution	Test 364 0.1m Cl^-/E 1.0m KCl p_wH 10.56	Standard 0.1m H_2SO_4	Test 365 0.1m Cl^-/E 1.0m KCl p_wH 10.09 Except:- 0.1m Br^-/E 1.0m KBr p_wH 10.01 (8-16 min)	Standard 0.1m H_2SO_4 (8 min.) 0.1m HBr
Time (min.)				
0	+2.2	+0.2	+1.3	0.0
1	+2.0	+0.4	+1.1	+0.2
2	+1.9	+0.5	+1.1	+0.2
5	+1.9	+0.5	+1.1	+0.3
10	+2.0 (8)		+1.2	+0.3
15			+1.3	+0.3
20			+1.3	
25				
30	+2.2			
Final	+2.3 (38)	+0.6 (8)	+1.3 (24)	+0.3 (15)

Electrode No. 14 14/4/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard $0.1mCl^-/T$ p_wH 8.68	Standard 0.1m H_2SO_4	Test 366 1.0m HCl	Standard 0.1m H_2SO_4	Standard $0.1mCl^-/T$ p_wH 8.68
Time (min.)					
0	-1.0	0.0	-2.4	+1.0	-0.6
1	-0.2	-0.2	-1.6	+0.2	-0.1
2	0.0	-0.1	-1.6	+0.1	0.0
5	+0.1	0.0	-1.4	+0.1	+0.1
10	+0.1		-1.4		
Final	+0.1 (10)	+0.1 (7)	-1.4 (11)	+0.1 (9)	+0.1 (8)

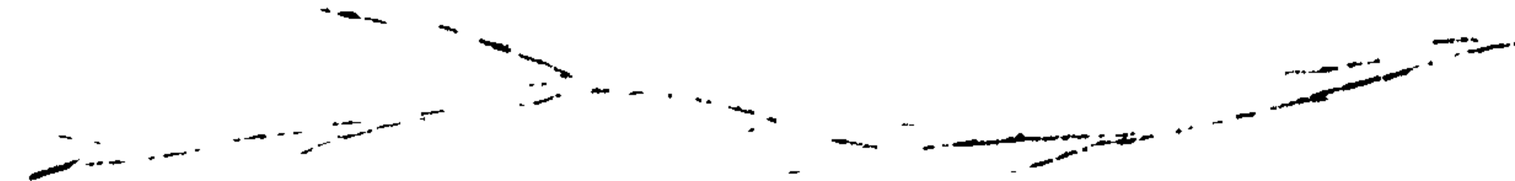
Electrode No. 15. Pye Ingold

				E_7
2/8/65	Mounted and placed in deionised water			
4/8/65	Sodium Solution	1.0m	p_wH 10.49	0.345
19/8/65 and 24/8/65	HCl Lithium Solution	0.5m 1.0m	 p_wH 10.59	0.344
1/11/65	Sodium Solution	1.0m	p_wH 13.00	0.344
22/11/65	Sodium Solution	1.0m	p_wH 11.97	0.344
5/5/66	Sodium Solution Lithium Solution	1.0m 1.0m	p_wH 10.55 p_wH 12.81	0.344
27/5/66	Lithium Solution	1.0m	p_wH 11.81	0.345
12/8/66	Sodium Solution	1.0m	p_wH 9.16	0.345

Resistance not measured.

Electrode No. 15 4/8/65 Initial Standard Solution 0.1m Cl^-/E p_wH 9.41

Solution	Standard 0.1m H_2SO_4	Standard 0.1m Cl^-/E p_wH 10.08	Standard 0.1m Cl^-/E p_wH 9.41	Test 66 0.1m Cl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1m Cl^-/E p_wH 9.41 (12 min.) 0.1m Cl^-/E p_wH 10.08
Time (min.)					
0	0.0	-0.2	-0.3	+1.5	-0.8
1	0.0	-0.4	-0.4	+1.0	-0.6
2	0.0	-0.4	-0.2	+1.0	-0.4
5	+0.1	-0.3	0.0	+1.0	-0.2
10					-0.1
15					0.0
20					+0.1
Final	+0.2 (8)	-0.3 (9)	0.0 (8)	+1.0 (8)	+0.1 (22)



Electrode No. 15 4/8/65 (Cont.)

Solution	Test 67 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 10.08	Standard 0.1m Cl^-/T p_wH 8.91 (8 min.) 0.1m H_2SO_4
Time (min.)			
0	+2.9	-1.1	+0.2
1	+2.1	-0.7	+0.1
2	+1.9	-0.5	+0.1
5	+1.9	-0.2	+0.3
10		-0.1	+0.1
		0.0 (13)	
15			+0.3
20			
		0.0 (35)	
Final	+1.9 (8)	0.0 (45)	+0.3 (17)

Electrode No. 15 19/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.52 except:- 0.1m H_2SO_4 (8-16 min.)	Test 261 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1mCl^-/E p_wH 10.52
Time (min.)			
0	-0.1	+1.3	-0.4
1	-0.2	+0.8	-0.3
2	-0.2	+0.9	-0.2
5	-0.2	+0.9	-0.1
10	-0.3		0.0
15	-0.2		
20	-0.4		
Final	-0.5 (24)	+0.9 (8)	0.0 (11)

Electrode No. 15 24/8/65 Initial Standard Solution

0,5m HCl

Solution	Standard 0.1m H_2SO_4	Standard 0.1m Cl^-/E p_wH 10.52	Standard 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 9.56	Standard 0.1m Cl^-/E p_wH 10.52	Test 262 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59
Time (min.)					
0	0.0	-0.1	+0.2	-0.5	+1.7
1	-0.3	-0.3	0.0	-0.5	+0.9
2	-0.2	-0.1	0.0	-0.4	+0.9
5	-0.1	0.0	+0.1	-0.2	+0.9
10	-0.1	0.0			
Final	-0.1 (12)	0.0 (11)	+0.1 (9)	-0.2 (8)	+0.9 (9)

Electrode No. 15 24/8/65 (Cont.)

Solution	Standard 0.1mCl^-/E p_wH 10.52
Time (min.)	
0	-0.8
1	-0.5
2	-0.4
5	-0.1
10	-0.1
Final	-0.1 (11)

Electrode No. 15 1/11/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m HCl (10 min.) 0.1mCl^-/E p_wH 10.38	Test 3 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1mCl^-/E p_wH 10.38	Test 4 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1mCl^-/E p_wH 10.38
Time (min.)					
0	-0.2	+32.9	-3.9	+33.4	-7.4
1	-0.4	+30.1	-2.3	+30.2	-4.7
2	-0.4	+29.4	-1.6	+29.1	-3.4
5	-0.3	+28.2	-0.9	+27.8	-2.1
10	-0.3	+27.3	-0.6	+26.9	-1.4
15	-0.3	+26.8	-0.5	+26.5	-1.0
20		+26.5	-0.5	+26.2	-0.8
25				+26.0	-0.6
30				+25.8	-0.5
35				+25.7	
40				+25.6	
Final	-0.4 (19)	+26.5 (20)	-0.5 (20)	+23.7* (3½ hours)	-0.5 (30)

* Final e.m.f. not constant. A decrease of 0.1mV in 6 minutes was observed.

Electrode No. 15. 1/11/63 (Cont.)

Solution	Test 5 0.1m Cl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1m Cl^-/E p_wH 10.38
Time (min.)		
0	+1.4	-1.0
1	+1.1	-0.4
2	+1.2	-0.3
5	+1.4	0.0
10		+0.2
15		
Final	+1.4 (9)	+0.2 (12)

Electrode No. 15 — 22/11/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.11	Test 14 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Standard 0.1m Cl^-/E p_wH 10.11	Test 15 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E p_wH 10.11
Time (min.)					
0	-0.2	+3.6	-1.4	+14.5	-3.3
1	0.0	+2.6	-0.5	+12.6	-1.3
2	+0.1	+2.4	-0.3	+12.1	-0.9
5	+0.1	+2.2	-0.1	+11.5	-0.4
10		+2.0		+11.0	-0.2
15				+10.8	0.0
Final	0.0 (7)	+2.0 (12)	-0.1 (8)	+10.7 (19)	0.0 (16)

<u>Electrode No. 15</u> 22/11/65 (Cont.)

Solution	Test 16 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E p_wH 10.11 except: 0.1m H_2SO_4 (15-23 min)
Time (min.)		
0	+15.0	-3.3
1	+12.8	-1.6
2	+12.2	-1.0
5	+11.4	-0.5
10	+10.9	-0.2
15	+10.7	-0.1
20	+10.5	0.0
25		0.0
30		+0.1
	+10.4 (35)	
Final	+10.4 (40)	+0.1 (31)

Electrode No. 15 5/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.01	Test 39 0.1mCl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1m H_2SO_4	Standard 0.1mCl^-/E p_wH 10.01	Test 38 0.1m LiOH 0.9m LiCl p_wH 12.81
Time (min.)					
0	0.0	+4.0	-1.0	+0.5	+31.6
1	-0.2	+2.6	-0.7	-0.5	+29.5
2	-0.2	+2.5	-0.4	-0.3	+28.8
5	-0.1	+2.5	-0.1	-0.1	+28.0
10			0.0		+27.4
15					+27.1
					+26.6 (40)
Final	-0.1 (8)	+2.5 (8)	0.0 (12)	0.0 (9)	+26.6 (47)

Electrode No. 15 5/5/66 (Cont.)

Solution	Standard 0.1m Cl^-/E p_wH 10.01	Standard 0.1m H_2SO_4
Time (min.)		
0	7±1	+1.0
1	-2.6	-0.2
2	-1.7	-0.1
5	-0.6	+0.2
10	-0.1	
15	+0.1	
Final	+0.1 (15)	+0.2 (9)

Electrode No. 15. 27/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.45	Test 37 0.01m LiOH 0.99m LiCl p_wH 11.81	Standard 0.1m H_2SO_4 (11 min.) 1.0m H_2SO_4
Time (min.)			
0	-0.8	+9.4	-2.9
1	-0.3	+9.0	-0.9
2	-0.2	+8.7	-0.6
5	0.0	+8.5	-0.1
10		+8.3	+0.1
15		+8.1	+0.1
Final	+0.1 (7)	+8.1 (19)	+0.1 (19)

Electrode No. 15. 12/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard Acetate 1.0m Na^+ p_wH 4.75	Standard 0.1m Cl^-/E 0.01m NaCl p_wH 10.09	Test 376 Borax 1.0m Na^+ p_wH 9.16
Time (min.)			
0	-0.2	-0.2	+0.8
1	-0.3	-0.4	+0.4
2	-0.2	-0.3	+0.3
5	0.0	-0.2	+0.5
10	0.0	-0.2	+0.6
Final	0.0 (10)	-0.2 (10)	+0.6 (10)

Electrode No. 16. Radiometer C.

				E_7
2/8/65	Mounted and placed in deionised water.			
10/8/65	Lithium Solution	1.0m	p_wH 10.59	0.621
	Sodium Solution	1.0m	p_wH 10.49	
18/11/65	HCl	1.0m		0.620
	Sodium Solution	1.0m	p_wH 11.97	
5/5/66	Lithium Solution	1.0m	p_wH 12.81	0.613
	Sodium Solution	1.0m	p_wH 10.55	
27/5/66	Lithium Solution	1.0m	p_wH 11.81	0.610
3/8/66	$MgSO_4$	1.9m	p_wH 4.16	0.608
	Fluoride Solution	0.1m	approx. p_wH 4.8	
	Sodium Solution	1.0m	p_wH 9.16	
9/8/66	Sodium Solution	1.0m	p_wH 9.14	0.607
12/9/66	Lithium Solution	1.0m	p_wH 12.81	0.608

Resistance 95 Megohms.

Electrode No. 16 10/8/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 9.41	Test 54 0.1mCl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1mCl^-/E p_wH 9.41	Test 59 0.1mCl^-/E 1.0m NaCl p_wH 9.85	Standard 0.1mCl^-/E p_wH 9.41
Time (min.)					
0	-0.2	+3.8	-0.8	+2.8	-1.4
1	+0.1	+4.0	+0.2	+3.0	-0.2
2	+0.2	+4.1	+0.3	+3.0	0.0
5	+0.2	+4.4	+0.3	+3.0	+0.1
10			+0.3		+0.1
15					
20					
25					
30		+4.8			
35		+4.9			
Final	+0.1 (8)	+4.9 (40)	+0.3 (12)	+3.0 (8)	+0.1 (10)

Electrode No. 16 10/8/65 (Cont.)

Solution	Test 60 0.1m Cl^-/E 1.0m NaCl p_wH 10.49	Standard 0.1m Cl^-/E p_wH 9.41 (9 min.) 0.1m H_2SO_4
Time (min.)		
0	+6.4	-1.1
1	+5.9	-0.3
2	+5.8	0.0
5	+5.8	+0.1
10	+5.9	0.0
15		+0.1
Final	+5.9 (10)	+0.1 (19)

Electrode No. 16 18/11/65 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.94	Test 9 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Standard 0.1m Cl^-/E p_wH 9.94	Test 10 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E p_wH 9.94
Time (min.)					
0	-0.2	+6.1	-1.5	+22.4	-3.8
1	0.0	+6.1	-0.6	+22.0	-1.4
2	0.0	+6.1	-0.4	+22.0	-0.9
5	0.0	+6.1	-0.1	+22.0	-0.4
10			-0.1	+22.2	-0.1
15					0.0
Final	0.0 (8)	+6.1 (7)	-0.1 (10)	+22.2 (12)	0.0 (16)

Electrode No. 16 18/11/65 (Cont.)

Solution	Test 11 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E p_wH 9.94	Standard 0.1m H_2SO_4 (7 min.) 1.0m HCl
Time (min.)			
0	+23.4	-4.8	-0.3
1	+22.9	-2.4	-0.1
2	+22.7	-1.6	0.0
5	+22.5	-1.0	+0.1
10	+22.4	-0.5	0.0
15		-0.3	
	+22.5 (35)		
Final	+22.5 (40)	-0.3 (19)	0.0 (13)

Electrode No. 16 5/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.01	Test 56 0.1m Cl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1m Cl^-/E p_wH 10.01	Test 57 0.1m Cl^-/E 0.1m NaCl p_wH 10.31	Standard 0.1m Cl^-/E p_wH 10.01
Time (min.)					
0	+1.0	+7.7	-0.9	+1.9	-0.7
1	-0.1	+7.2	-0.4	+2.0	-0.4
2	0.0	+7.1	-0.2	+2.0	-0.2
5	0.0	+7.1	-0.1	+2.0	-0.1
10			0.0		+0.1
Final	0.0 (9)	+7.1 (9)	0.0 (10)	+2.0 (8)	+0.1 (10)

Electrode No. 16 5/5/66 (Cont.)

Solution	Test 50 0.1m LiOH 0.9m LiCl p_wH 12.81	Standard 0.1m Cl^-/E p_wH 10.01 (22 min.) 0.1m H_2SO_4
Time (min.)		
0	+40.2	-3.9
1	+41.2	-1.2
2	+41.8	-0.4
5	+42.9	+0.5
10	+43.9	+0.9
15	+44.7	+1.1
20	+45.3	+1.2
25	+45.9	+1.3
30		+1.3
35		
40	+47.5	
45	+47.9	
50	+48.2	
	+50.5 (95)	
Final	+50.8 (102)	+1.3 (32)

Electrode No. 16 27/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.45	Test 49 0.01m LiOH 0.99m LiCl p_wH 11.81	Standard 0.1m H_2SO_4 (15 min.) 1.0m H_2SO_4
Time (min.)			
0	-0.3	+17.2	-0.7
1	-0.1	+19.1	+0.6
2	0.0	+19.5	+0.9
5	0.0	+20.2	+1.2
10		+20.9	+1.3
15		+21.3	
20		+21.7	+1.3
25		+22.0	+1.2
30		+22.2	+1.2
35		+22.5	
40		+22.7	
45		+22.8	
		+24.0 (75)	
Final	+0.1 (8)	+24.2 (84)	+1.2 (30)

Electrode No. 16 3/8/66 Initial Standard Solution

Acetate 1.0m Na^+ p_wH 4.75

Solution	Standard 1.87m $MgSO_4$ p_wH 4.16 (8 min.) 0.1m H_2SO_4	Test 69 Borax 1.0m Na^+ p_wH 9.16	Standard Acetate 1.0m Na^+ p_wH 4.75	Test 352* Acetate 0.1m F^- Approx. p_wH 4.8	Standard Acetate 1.0m Na^+ p_wH 4.75 (8 min.) 1.87m $MgSO_4$ p_wH 4.16
Time (min.)					
0	-0.3	+1.5	-1.7	-1.5	-1.2
1	-0.2	+1.5	-0.2	-1.0	0.0
2	-0.1	+1.5	-0.1	-1.2	0.0
5	-0.1	+1.5	0.0	-1.5	+0.1
10	+0.1		+0.1	-1.6	-0.1
15	+0.2				0.0
Final	+0.2 (17)	+1.5 (7)	+0.1 (10)	-1.6 (13)	0.0 (16)

*On account of the instability of the potential of the hydrogen electrode for this solution these are observed rather than true values. They have been included to indicate the time variation of the glass electrode potential, (See Chapter 9).

Solution	Test 70 Borax 1.0m Na^+ p_wH 9.16	Standard Acetate 1.0m Na^+ p_wH 4.75 (10 min.) 0.1m H_2SO_4
Time (min.)		
0	+3.0	-1.3
1	+1.9	-0.2
2	+1.8	0.0
5	+1.8	+0.2
10		+0.2
15		+0.2
Final	+1.8 (7)	+0.3 (18)

Electrode No. 16. 9/8/66. Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.29	Test 58 0.1mCl^-/T 1.0m NaCl p_wH 9.14	Standard 0.1mCl^-/E p_wH 10.29
Time (min.)			
0	+0.2	+1.4	-1.8
1	-0.3	+1.7	-0.3
2	-0.3	+1.7	-0.1
5	-0.2	+1.7	-0.2
10			+0.1
Final	-0.2 (7)	+1.8 (7)	+0.1 (11)

Electrode No. 16 12/9/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15	Test 51 0.1m LiOH 0.9m LiCl p_wH 12.81	Standard 0.5m Cl^-/E p_wH 9.93 (11 min.) 0.5m Cl^-/T p_wH 8.15	Standard 1.85m $MgSO_4$ p_wH 8.43	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.7	+47.1	-1.2	-0.5	-0.1
1	-0.2	+48.4	+0.2	-0.3	0.0
2	-0.1	+49.1	+0.8	-0.2	+0.1
5	0.0	+50.4	+1.4	-0.2	+0.2
10		+51.8	+1.5		+0.2
15		+52.6	+1.4		
20			+1.2		
25					
30					
35					
40		+55.0			
45		+55.4			
				-0.1 (50)	
		+57.3 (90)			
		+57.5 (95)			
		+58.5 (120)			
Final	0.0 (8)	+58.7 (126)	+1.2 (21)	-0.1 (55)	+0.2 (11)

Solution	Standard $0.5mCl^-/T$ p_wH 8.15
Time (min.)	
0	-0.6
1	-0.3
2	-0.1
5	-0.1
10	
15	
20	
25	-0.1
Final	-0.1 (28)

Electrode No. 17. Radiometer 8.

				E_7
2/8/65	Mounted and placed in deionised water.			
18/8/65	Lithium Solution	1.0m	p_wH 10.59	0.623
1/11/65	Sodium Solution	1.0m	p_wH 13.00	0.626
18/11/65	HCl	1.0m		0.624
	Sodium Solution	1.0m	p_wH 13.00	
17/12/65	HBr	11 m		0.625
21/1/66	Tetraethylammonium hydroxide		p_wH 13.14	0.626
5/5/66	Sodium Solution	1.0m	p_wH 10.55	0.627
	Lithium Solution	1.0m	p_wH 12.81	
27/5/66	Lithium Solution	1.0m	p_wH 11.81	0.628
9/8/66	Sodium Solution	1.0m	p_wH 9.14	0.628
14/9/66	$MgSO_4$	1.85m	p_wH 8.43	0.628
	Fluoride Solution	0.1m	approx. p_wH 4.8	
	Sodium Solution	1.0m	p_wH 13.00	
	Lithium Solution	1.0m	p_wH 12.81	

Resistance 140 Megohms.

Electrode No. 17. 18/8/65 (1) Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.52 (7 min.) 0.1m H_2SO_4	Test 373 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m H_2SO_4	Test 374 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.59	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.4	+0.5	-0.5	+0.4	-0.3
1	-0.3	+0.4	-0.2	+0.4	-0.1
2	-0.2	+0.4	-0.1	+0.4	-0.1
5	-0.2	+0.5	0.0	+0.4	0.0
10	-0.1		0.0		
15	-0.1				
Final	-0.1 (15)	+0.5 (8)	0.0 (12)	+0.4 (8)	0.0 (7)

Electrode No. 17. 18/8/65 (2) Initial Standard Solution $0.1mCl^-/E$, p_wH 10.52

Solution	Standard $0.1m\ H_2SO_4$	Standard $0.1mCl^-/E$ $0.5m\ Li_2SO_4$ p_wH 9.56	Standard $0.1m\ H_2SO_4$	Test 375 $0.1mCl^-/E$ $0.5m\ Li_2SO_4$ p_wH 10.59	Standard $0.1m\ H_2SO_4$
Time (min.)					
0	0.0	-1.8	-0.4	0.0	-0.3
1	+0.2	-0.1	-0.2	+0.5	-0.2
2	+0.2	+0.1	-0.2	+0.6	-0.1
5	+0.2	+0.2		+0.6	0.0
Final	+0.3 (8)	+0.2 (9)	-0.1 (8)	+0.6 (8)	0.0 (7)

Electrode No. 17 1/11/65 Initial Standard Solution 0.1m HCl

Solution	Standard 0.1m H_2SO_4 (8 min.) 0.1mCl^-/E p_wH 10.38	Standard 0.1mCl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1mCl^-/E p_wH 10.38	Test 1 0.9m NaCl 0.1m NaOH p_wH 13.00	Standard 0.1mCl^-/E p_wH 10.38
Time (min.)					
0	-0.2	+0.1	-1.2	+8.8	-1.6
1	+0.1	+0.2	-0.3	+7.3	-0.6
2	+0.1	+0.2	-0.2	+6.8	-0.3
5	+0.2	+0.2	-0.2	+6.1	-0.1
10	+0.2			+5.6	0.0
15	+0.2			+5.4	0.0
Final	+0.2 (16)	+0.2 (6)	-0.2 (7)	+5.4 (15)	0.0 (45)

Electrode No. 17 1/11/65 (Cont.)

Solution	Test 2 0.9m NaCl 0.1m NaOH p_wH 13.00	Standard 0.1m Cl^-/E p_wH 10.38 (12 min.) 0.1m HCl
Time (min.)		
0	+8.9	-1.8
1	+7.3	-0.8
2	+6.9	-0.5
5	+6.0	-0.1
10	+5.4	0.0
15	+5.2	+0.1
20	+5.0	+0.1
25	+4.8	
30	+4.7	
Final	+4.7 (32)	+0.1 (24)

Electrode No. 17 — 18/11/65 (1) — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.94	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Test 6 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52
Time (min.)				
0	-0.3	-0.1	+1.8	-0.9
1	-0.1	0.0	+1.6	-0.6
2	0.0	0.0	+1.5	-0.4
5	0.0	0.0	+1.4	-0.3
Final	0.0 (7)	0.0 (7)	+1.4 (8)	-0.3 (8)

Electrode No. 17 — 18/11/65 (2) — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Test 7 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Test 8 0.01m NaOH 0.99m NaCl p_wH 11.97
Time (min.)				
0	-0.4	+7.0	-2.7	+1.7
1	0.0	+6.3	-1.2	+1.5
2	+0.1	+5.7	-0.7	+1.4
5	+0.1	+5.0	-0.4	+1.3
10		+4.4	-0.3	
15		+4.1		
20		+3.9		
Final	+0.1 (8)	+3.8 (23)	-0.3 (12)	+1.3 (8)

Electrode No. 17 5/5/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.01	Test 71 0.1m Cl^-/E 1.0m NaCl p_wH 10.55	Standard 0.1m Cl^-/E p_wH 10.01	Standard 0.1m Cl^-/E 0.1m NaCl p_wH 10.31	Test 31 0.1m LiOH 0.9m LiCl p_wH 12.81
Time (min.)					
0	+1.0	+1.3	+0.1	0.0	+18.3
1	-0.1	+0.6	-0.1	-0.3	+17.0
2	-0.1	+0.5	0.0	-0.2	+16.8
5	-0.1	+0.5	0.0	-0.2	+16.6
10					+16.6
15					+16.8
Final	-0.1 (8)	+0.5 (8)	0.0 (8)	-0.2 (7)	+16.8 (16)

Electrode No. 17 5/5/66 (Cont.)

Solution	Standard 0.1m Cl^-/E $p_W H$ 10.01 (13 min.) 0.1m H_2SO_4
Time (min.)	
0	-1.2
1	-0.3
2	0.0
5	+0.2
10	+0.2
15	+0.2
20	+0.2
Final	+0.3 (21)

Electrode No. 17 27/5/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 1.0m H_2SO_4 (9 min.) 0.1m H_2SO_4	Standard 0.1m Cl^-/E p_wH 9.45	Test 35 0.01m LiOH 0.99m LiCl p_wH 11.81	Standard 0.1m H_2SO_4 (8 min.) 0.1m Cl^-/E p_wH 9.45	Test 36 0.01m LiOH 0.99m LiCl p_wH 11.81
Time (min.)					
0	-0.9	-0.5	+5.4	-1.2	+6.2
1	0.0	-0.1	+5.4	-0.4	+5.6
2	0.0	0.0	+5.3	-0.2	+5.5
5	0.0	+0.1	+5.2	-0.1	+5.4
					+5.4 (8)
10	-0.1			-0.1	
15	-0.1			0.0	
20	-0.1				
					+5.4 (50)
Final	0.0 (23)	+0.2 (9)	+5.2 (9)	0.0 (19)	+5.5 (57)

Electrode No. 17 27/5/66 (Cont.)

Solution	Standard $0.1mCl^-/E$ p_wH 9.45
Time (min.)	
0	-1.7
1	-0.6
2	-0.3
5	-0.1
Final	+0.1 (10)

Electrode No. 17 14/9/66 (1) Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15	Test 26 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/T p_wH 8.15 (12 min.) 0.1m H_2SO_4	Test 27 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.2	+9.5	-0.8	+9.7	-1.4
1	0.0	+7.4	-0.7	+7.0	-0.7
2	+0.1	+6.9	-0.4	+6.4	-0.3
5	+0.1	+6.2	-0.2	+5.7	0.0
10		+5.7	0.0	+5.2	+0.2
15		+5.4	0.0	+5.0	+0.3
20		+5.2	0.0		
25		+5.1			
30		+5.0			
35		+4.9			
40				+4.7	
				+4.6 (74)	
Final	+0.1 (8)	+4.9 (36)	0.0 (20)	+4.5 (80)	+0.3 (19)

Solution	Test 28 0.1m LiOH 0.9m LiCl p_wH 12.81	Standard 0.1m H_2SO_4
Time (min.)		
0	+20.5	-6.4
1	+18.2	-1.3
2	+17.1	-0.3
5	+15.7	+0.5
10	+14.9	+0.9
15	+14.6	+1.0
20	+14.4	
	+14.4 (50)	
	+15.3 (120)	
Final	+15.4 (127)	+1.0 (17)

Electrode No. 17 14/9/66 (2) Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15	Standard 1.85m $MgSO_4$ p_wH 8.43	Test 351* Acetate 0.1m F^- Approx. p_wH 4.8	Standard 0.5m Cl^-/T p_wH 8.15 (13 Min.) 1.85m $MgSO_4$ p_wH 8.43	Standard 0.1m H_2SO_4 (27 min.) 0.5m Cl^-/T p_wH 8.15
Time (min.)					
0	-0.8	-0.7	+0.1	-15.2	-0.4
1	-0.2	-0.3	-4.0	-14.0	-1.1
2	0.0	-0.2	-8.6	-13.0	-1.6
5	0.0	0.0	-20.1	-11.6	-2.3
10			-23.9	-10.6	-2.2
15	0.0			- 9.9	-1.9
20				- 9.3	-1.6
25					-1.3
30					-1.1
				-7.7 (60)	
Final	0.0 (15)	0.0 (7)	-27.2 (13)	-7.6 (64)	-0.8 (34)

* On account of the instability of the potential of the hydrogen electrode for this solution these are observed rather than true values. They have been included to illustrate the time variation of the glass electrode potential. (See Chapter 9).

Electrode No. 18. E.I.L. GHS 33.

16/8/65 Mounted and placed in deionised water

				E_7
18/11/65 and 25/11/65	HCl	1.0m		0.351
	Sodium Solution	1.0m	p_wH 13.00	

Resistance 550 Megohms.

Electrode No. 18 25/11/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard $0.1mCl^-/E$ p_wH 10.11	Standard $0.1mCl^-/E$ 1.0m NaCl p_wH 10.52	Standard $0.1mCl^-/E$ p_wH 10.11 (10 min.) 0.1m H_2SO_4	Standard $0.1mCl^-/E$ 1.0m NaCl p_wH 10.52	Test 22 0.01m NaOH 0.99m NaCl p_wH 11.97
Time (min.)					
0	-0.3	+0.5	-0.8	-0.7	+2.0
1	-0.2	+0.4	-0.3	+0.3	+1.6
2	-0.2	+0.3	-0.2	+0.3	+1.4
5	-0.2	+0.2	-0.2	+0.2	+1.1
10			-0.2		+1.0
15			+0.1		
Final	-0.2 (9)	+0.2 (7)	+0.1 (19)	+0.2 (9)	+0.9 (13)

Electrode No. 18 25/11/65 (Cont.)

Solution	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Test 23 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Standard 0.1m Cl^-/E p_wH 10.11	Standard 0.1m H_2SO_4
Time (min.)					
0	-2.1	+5.1	+3.5	-1.2	-0.8
1	-0.6	+4.9	-1.3	-0.5	0.0
2	-0.4	+4.5	-0.8	-0.4	+0.1
5	-0.2	+3.9	-0.4	-0.2	+0.1
10	-0.1	+3.6	-0.2	-0.1	
15		+3.4	0.0		
		+3.0 (40)			
Final	-0.1 (10)	+2.9 (45)	0.0 (15)	-0.1 (13)	+0.1 (8)

Electrode No. 18 25/11/65 (Cont.)

Solution	Standard 0.5m HCl	Standard 0.1m Cl^-/E p_wH 10.11 (8 min.) 0.5m HCl
Time (min.)		
0	-0.7	-0.9
1	-0.2	-0.2
2	-0.2	-0.2
5	-0.2	-0.2
10		-0.2
15		-0.2
Final	-0.2 (7)	-0.2 (17)

Electrode No. 19. Beckman E2.

6/10/65	Mounted and placed in deionised water.			
				E_7
12/11/65	HCl	0.5m		0.663
	Sodium Solution	1.0m	p_wH 13.00	
22/11/65	Sodium Solution	1.0m	p_wH 11.97	0.661

Resistance 400 Megohms.

Electrode No. 19 12/11/65 Initial Standard Solution

$0.1mCl^-/E$ p_wH 9.94

Solution	Test 74 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard $0.1mCl^-/E$ p_wH 9.94
Time (min.)		
0	+5.8	-1.8
1	+4.5	-0.4
2	+4.0	-0.2
5	+3.3	0.0
10	+3.0	
15	+2.8	
Final	+2.7 (18)	+0.1 (9)

Electrode No. 19 22/11/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1mCl^-/E p_wH 10.11	Standard 0.1mCl^-/E 1.0m NaCl p_wH 10.52	Test 20 0.01m NaOH 0.99m NaCl p_wH 11.97	Standard 0.1mCl^-/E p_wH 10.11 Except:- 0.1m H_2SO_4 (12-23 min)	Test 21 0.01m NaOH 0.99m NaCl p_wH 11.97
Time (min.)					
0	-0.4	+1.5	+2.1	-0.5	+3.5
1	-0.1	+0.2	+1.7	-0.3	+2.1
2	0.0	0.0	+1.6	-0.1	+1.8
5	+0.1	0.0	+1.5	+0.1	+1.6
					+1.6 (8)
10			+1.6	+0.3	
15				0.0	
20				+0.2	
25				+0.4	
30				+0.5	+1.9
Final	+0.1 (7)	0.0 (8)	+1.6 (11)	+0.5 (30)	+2.0(36)

Electrode No. 19 22/11/65 (Cont.)

Solution	Standard 0.1mCl^-/E p_wH 10.11
Time (min.)	
0	+0.3
1	+0.4
2	+0.4
5	+0.6
Final	+0.7 (8)

Electrode No. 21. Jena H.

8/10/65	Mounted and placed in deionised water			
				E_7
12/11/65	HCl	0.5m		0.360
	Sodium Solution	1.0m	p_wH 10.04	
17/12/65	HBr	1lm		0.363
	Lithium Solution	1.0m	p_wH 10.74	
4/1/66	HCl	1.0m		0.365
	Sodium Solution	1.0m	p_wH 9.84	
22/4/66	Sodium Solution	1.0m	p_wH 10.55	0.386
9/8/66	Fluoride Solution	0.1m	approx. p_wH 4.8	0.387
	Sodium Solution	1.0m	p_wH 9.16	

Resistance 70 Megohms.

Electrode No. 21 12/11/65 Initial Standard Solution

$0.1mCl^-/E$ p_wH 9.94

Solution	Standard $0.1m\ H_2SO_4$ (7 min.) $0.1mCl^-/E$ p_wH 9.94	Test 164 $0.1mCl^-/E$ 1.0m NaCl p_wH 10.04	Standard $0.1mCl^-/E$ p_wH 9.94 (8 min.) $0.1m\ H_2SO_4$	Test 165 $0.1mCl^-/E$ 1.0m NaCl p_wH 10.04	Standard $0.1m\ H_2SO_4$
Time (min.)					
0	-0.1	+3.8	-0.7	+4.2	-0.3
1	0.0	+3.8	-0.1	+4.1	0.0
2	0.0	+3.9	0.0	+4.1	+0.1
5	+0.1	+4.0	+0.1	+4.2	+0.1
10	+0.1	+4.1	0.0		
15	+0.2		0.0		
Final	+0.2 (16)	+4.1 (10)	0.0 (16)	+4.3 (7)	+0.1 (7)

Electrode No. 21 12/11/65 (Cont.)

Solution	Test 166 0.5m HCl	Standard 0.1m H_2SO_4 (8 min.) 0.1mCl^-/E p_wH 9.94	Test 167 0.1mCl^-/E 1.0m NaCl p_wH 10.04	Standard 0.1m H_2SO_4
Time (min.)				
0	-1.4	-0.8	+5.6	-2.3
1	-0.9	-0.1	+4.9	-0.7
2	-0.9	-0.1	+4.7	-0.4
5	-0.9	-0.1	+4.6	-0.2
10		0.0	+4.6	-0.1
15		0.0		
Final	-0.9 (8)	0.0 (17)	+4.6 (10)	-0.1 (11)

Electrode No. 21 17/12/65 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m HBr	Test 176 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74	Standard 0.1m HBr	Test 177 1lm HBr	Standard 0.1m HBr (8 min.) 0.1m H_2SO_4
Time (min.)					
0	0.0	+2.7	-0.8	-28.5	+1.7
1	0.0	+2.5	-0.2	-40.8	-1.1
2	0.0	+2.5	-0.1	-49.6	-1.1
5	+0.1	+2.5	0.0	-66.5	-1.0
10				-79.5	-0.8
15				-87.3	-0.7
Final	+0.1 (7)	+2.5 (8)	0.0 (9)	-91.1 (19)	-0.7 (16)

Solution	Test 178 0.1m Cl^-/E 0.5m Li_2SO_4 p_wH 10.74
Time (min.)	
0	+7.2
1	+5.5
2	+5.1
5	+4.5
10	+4.1
Final	+4.0 (14)

Electrode No.21. 4/1/66. Initial Standard Solution $0.1m\ H_2SO_4$

Solution	Standard $0.1mCl^-/E$ p_wH 9.83	Test 193 $0.1mCl^-/E$ 1.0m NaCl p_wH 9.84	Standard $0.1mCl^-/E$ p_wH 9.83 (10 min.) $0.1m\ H_2SO_4$	Test 194 $0.1mCl^-/E$ 1.0m NaCl p_wH 9.84	Standard $0.1m\ H_2SO_4$
Time (min.)					
0	-0.1	+4.5	0.0	+3.9	-0.2
1	0.0	+3.5	-0.2	+3.6	-0.1
2	0.0	+3.5	-0.1	+3.6	0.0
5	0.0	+3.6	0.0	+3.6	0.0
10		+3.6	0.0	+3.6	
15			0.0		
Final	0.0 (9)	+3.6 (10)	0.0 (18)	+3.6 (10)	0.0 (8)

Electrode No. 21. 4/1/66 (Cont.)

Solution	Test 195 1.0m HCl	Standard 0.1m H_2SO_4	Test 196 0.1m Cl^-/E 1.0m NaCl p_wH 9.84	Standard 0.1m H_2SO_4	Test 197 1.0m HCl
Time (min.)					
0	-4.2	+0.5	+8.5	-3.3	-4.8
1	-3.7	-0.1	+5.9	-1.4	-4.0
2	-3.6	-0.1	+5.3	-0.8	-3.8
5	-3.6	-0.1	+4.8	-0.1	-3.9
10			+4.5	+0.2	-4.0
15			+4.4	+0.3	-4.1
20			+4.3		
			+4.4 (40)		
Final	-3.6 (8)	-0.1 (8)	+4.4 (49)	+0.3 (18)	-4.1 (15)

Electrode No. 21. 4/1/66. (Cont.)

Solution	Standard 0.1m H_2SO_4	Test 198 0.1m Cl^-/E 1.0m NaCl p_wH 9.84	Standard 0.1m H_2SO_4	Test 199 1.0m HCl	Standard 0.1m H_2SO_4
Time (min.)					
0	+0.1	+10.5	-6.2	-5.1	+0.5
1	-0.2	+ 8.3	-3.4	-4.1	-0.2
2	-0.3	+ 7.4	-2.3	-4.0	-0.2
5	-0.2	+ 6.3	-1.0	-3.9	-0.2
10		+ 5.6	-0.3		
15		+ 5.3	-0.1		
20		+ 5.1	0.0		
25		+ 5.0			
Final	-0.2 (9)	+4.9 (27)	+0.1 (23)	-4.2 (35)	-0.2 (9)

Electrode No. 21. 4/1/66. (Cont.)

Solution	Test 200 0.1m Cl^-/E 1.0m NaCl p_wH 9.84	Standard 0.1m H_2SO_4
Time (min.)		
0	+15.0	-11.5
1	+12.3	- 7.9
2	+10.9	- 5.7
5	+ 9.0	- 2.9
10	+ 7.8	- 1.2
15	+ 7.1	- 0.6
20	+ 6.8	- 0.3
25	+ 6.5	- 0.1
30	+ 6.3	+ 0.1
35	+ 6.2	
40	+ 6.0	
45	+ 5.9	
50	+ 5.8	
Final	+ 5.8 (50)	+0.1 (31)

Electrode No. 21 22/4/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/T p_wH 8.68	Test 211 0.1m Cl^-/T 1.0m NaCl p_wH 9.04	Standard 0.1m Cl^-/T p_wH 8.68	Test 212 0.1m Cl^-/E 1.0m NaCl p_wH 10.55
Time (min.)				
0	+0.2	+1.1	+0.1	+9.5
1	0.0	+1.0	-0.2	+9.3
2	+0.1	+1.0	-0.1	+9.3
5	+0.1	+1.0	0.0	+9.5
10				+9.7
Final	+0.1 (8)	+1.0 (7)	0.0 (8)	+9.9 (20)

Electrode No. 21 9/8/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 10.29	Test 221 0.1m Cl^-/T 1.0m NaCl p_wH 9.14	Standard 0.1m Cl^-/E p_wH 10.29	Test 222 Borax 1.0m Na^+ p_wH 9.16	Standard 0.1m Cl^-/E p_wH 10.29
Time (min.)					
0	+1.0	+1.7	+0.4	+1.6	0.0
1	+0.1	+1.3	0.0	+1.4	0.0
2	+0.1	+1.3	0.0	+1.4	+0.1
5	+0.1	+1.4	+0.1	+1.4	+0.1
10					
15					
20					
25					
30					-0.2
35					-0.2
40					-0.2
Final	+0.1 (7)	+1.4 (7)	+0.1 (8)	+1.4 (8)	-0.2 (40)

Electrode No. 21 9/8/66 (Cont.)

Solution	Standard 0.1m H_2SO_4	Test 223* Acetate 0.1m F^- Approx. p_wH 4.8	Standard 0.1m H_2SO_4 (8 min.) 0.1mCl^-/E p_wH 10.29	Test 224 Borax 1.0m Na^+ p_wH 9.16	Standard 0.1mCl^-/E p_wH 10.29
Time (min.)					
0	-0.1	-2.3	-0.8	+3.8	-2.3
1	-0.1	-2.3	-0.3	+3.8	-2.0
2	-0.1	-2.3	-0.2	+3.6	-1.6
5	-0.1	-2.4	-0.2	+2.9	-0.9
10		-2.8	+0.1	+2.3	-0.4
15		-3.0	+0.2	+2.0	-0.2
20		-3.0		+1.9	-0.1
25		-3.0			
Final	-0.1 (7)	-3.0 (25)	+0.2 (16)	+1.9 (23)	-0.1 (20)

* On account of the instability of the potential of the hydrogen electrode for this solution, these are observed rather than true values. They have been included to illustrate the time variation of the glass electrode potential. (See Chapter 9).

Electrode No. 22. Jena. HA.

				E_7
20/11/65	Mounted and placed in deionised water.			
25/11/65	HCl	0.5m		0.488
	Sodium Solution	1.0m	p_wH 13.00	
21/1/66	Tetraethylammonium hydroxide		p_wH 13.14	0.485
11/5/66	Lithium Solution	1.0m	p_wH 12.81	0.488
3/8/66	Fluoride Solution	0.1m	approx. p_wH 4.8	0.489
	Sodium Solution	1.0m	p_wH 9.16	
10/8/66	Sodium Solution	1.0m	p_wH 9.16	0.487
12/9/66	$MgSO_4$	1.85m	p_wH 8.43	0.489
	Sodium Solution	1.0m	p_wH 13.00	

Resistance 500 Megohms.

Electrode No. 22 — 25/11/65 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.5m HCl	Standard 0.1m H_2SO_4 (7 min.) 0.1m Cl^-/E p_wH 10.11	Test 17 0.1m Cl^-/E 1.0m NaCl p_wH 10.52	Standard 0.1m Cl^-/E p_wH 10.11	Test 18 0.01m NaOH 0.99m NaCl p_wH 11.97
Time (min.)					
0	-1.7	-0.7	+0.7	-0.7	+4.6
1	-0.1	-0.1	+0.9	-0.2	+3.8
2	0.0	0.0	+0.8	-0.2	+3.4
5	0.0	0.0	+0.7	-0.1	+2.9
10	0.0	0.0	+0.6		+2.7
15		0.0			+2.5
Final	0.0 (10)	0.0 (15)	+0.5 (13)	-0.1 (8)	+2.5 (18)

Electrode No. 22 25/11/65 (Cont.)

Solution	Standard 0.1m Cl^-/E p_wH 10.11	Test 19 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m Cl^-/E p_wH 10.11 (15 min.) 0.5m HCl
Time (min.)			
0	-2.4	+12.1	-4.1
1	-0.6	+9.8	-1.6
2	-0.4	+8.7	-1.0
5	-0.2	+7.4	-0.4
10	-0.1	+6.7	-0.2
15		+6.3	0.0
20		+6.1	0.0
		+5.4 (40)	
Final	-0.1 (12)	+5.4 (50)	0.0 (22)

Electrode No. 22 — 11/5/66 — Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.1m Cl^-/E p_wH 9.45	Test 34 0.1m Cl^-/E 1.0m LiCl p_wH 10.20	Standard 0.1m Cl^-/E p_wH 9.45	Test 32 0.01m LiOH 0.99m LiCl p_wH 11.81	Standard 0.1m Cl^-/E p_wH 9.45
Time (min.)					
0	0.0	+1.5	-0.5	+8.9	-4.6
1	+0.1	+0.3	-0.2	+7.4	-1.0
2	+0.1	+0.2	-0.1	+7.0	-0.5
5	+0.1	+0.1	-0.1	+6.5	-0.1
10		+0.0		+6.3	0.0
15				+6.3	
				+6.2 (37)	
Final	+0.1 (8)	0.0 (10)	-0.1 (7)	+6.2 (43)	0.0 (14)

Solution	Test 33 0.1m LiOH 0.9m LiCl p_wH 12.81	Standard 0.1m Cl^-/E p_wH 9.45 (13 min.) 0.1m H_2SO_4	Standard 0.1m Cl^-/E p_wH 9.45 (9 min.) 0.1m H_2SO_4
Time (min.)			
0	+27.6	-4.4	+1.6
1	+23.8	-1.4	+0.2
2	+22.6	-0.7	+0.2
5	+21.4	-0.2	+0.2
10	+20.8	+0.1	+0.2
15	+20.5	0.0	+0.1
20	+20.5	+0.1	
Final	+20.5 (21)	+0.1 (22)	+0.1 (16)

Electrode No. 22 3/8/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard Acetate 1.0m Na^+ p_wH 4.75	Standard Borax 1.0m Na^+ p_wH 9.16	Standard Acetate 1.0m Na^+ p_wH 4.75	Test 349* Acetate 0.1m F^- Approx. p_wH 4.8	Standard Acetate 1.0m Na^+ p_wH 4.75
Time (min.)					
0	-3.3	-1.0	-3.4	-0.9	-15.7
1	-0.2	+0.1	-0.4	+0.4	-13.4
2	0.0	+0.1	-0.2	-0.8	-12.6
5	0.0	+0.1	-0.1	-5.5 (6)	-11.5
10				-16.8	-10.5
15				-25.0	- 9.9
20				-23.3	- 9.5
25				-23.7	- 9.2
30				-25.0	- 8.9
Final	0.0 (8)	+0.1 (8)	-0.1 (8)	-25.0 (30)	-8.8 (31)

* On account of the instability of the potential of the hydrogen electrode for this solution these are observed rather than true values. They have been included to illustrate the time variation of the glass electrode potential. (See Chapter 9).

<u>Electrode No. 22</u> 3/8/66 (Cont.)

Solution	Standard Borax 1.0m Na^+ p_wH 9.16	Standard Acetate 1.0m Na^+ p_wH 4.75	Standard 0.1m H_2SO_4
Time (min.)			
0	+1.0	-2.8	-0.6
1	+2.5	-4.0	-0.2
2	+3.2	-5.0	-0.3
5	+4.3	-6.4	-0.4
10	+5.1	-6.9	-0.3
15		-6.7	
20			
25			
30	+6.0		
35			
40	+6.2		
45	+6.3		
Final	+6.4 (48)	-6.7 (15)	-0.3 (10)

Electrode No. 22 12/9/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15 Except: 0.5m Cl^-/E p_wH 9.93 (10-17 min)	Test 24 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/T p_wH 8.15 (13 min.) 0.1m H_2SO_4	Test 25 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.1m H_2SO_4
Time (min.)					
0	-0.2	+9.7	-2.6	+10.0	-4.2
1	0.0	+7.7	-0.9	+7.2	-0.9
2	0.0	+6.9	-0.5	+6.3	-0.3
5	+0.1	+5.9	-0.1	+5.2	+0.2
10	0.0	+5.3	+0.1	+4.7	+0.5
15	-0.1	+5.0	+0.2	+4.4	
20	0.0		+0.2	+4.3	
25		+4.5			
30				+4.1	
35	0.0	+4.3			
40	0.0	+4.3			
				+4.0 (90)	
Final	0.0 (43)	+4.3 (42)	+0.2 (22)	+4.0 (100)	+0.6 (14)

Electrode No. 27. Corning.

				E_7
16/5/66	Mounted and placed in deionised water			
27/5/66	Lithium Solution	1.0m	p_wH 11.81	0.668
12/9/66	$MgSO_4$	1.85m	p_wH 8.43	0.673
	Lithium Solution	1.0m	p_wH 12.81	to
	Sodium Solution	1.0m	p_wH 13.00	0.677
15/9/66	$MgSO_4$	1.85m	p_wH 8.43	0.671
	Sodium Solution	1.0m	p_wH 13.00	
Resistance	250 Megohms.			

Electrode No. 27 27/5/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 1.0m H_2SO_4	Standard 0.1m H_2SO_4	Standard 0.1mCl^-/E p_wH 9.45	Test 47 0.01m LiOH 0.99m LiOH p_wH 11.81	Standard 0.1mCl^-/E p_wH 9.45
Time (min.)					
0	-0.8	-0.6	+0.5	+12.1	-2.0
1	-0.1	-0.1	+0.1	+11.5	+1.0
2	0.0	0.0	+0.1	+11.2	+1.4
5	0.0	0.0	+0.1	+11.2	+1.7
10	0.0			+11.4	+1.7
15					
20					
25					
30				+13.0	
35				+13.3	
Final	0.0 (14)	0.0 (19)	+0.1 (7)	+13.3 (35)	+1.7 (11)

Electrode No. 27 27/5/66 (Cont.)

Solution	Standard 0.1m H_2SO_4 Except:- 1.0m H_2SO_4 (9-18 min)	Test 48 0.01m LiOH 0.99m LiCl p_wH 11.81	Standard 0.1m H_2SO_4
Time (min.)			
0	-1.0	+14.6	-1.9
1	-0.2	+13.4	+0.4
2	-0.2	+12.9	+0.8
5	-0.2	+12.8	+1.0
10		+13.1	+0.9
15	-0.4	+13.5	
20	-0.5	+13.8	
25	-0.5	+14.2	
30		+14.5	
Final	-0.5 (26)	+14.7 (32)	+0.8 (14)

Electrode No. 27 12/9/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15 (9 min.) 0.5m Cl^-/E p_wH 9.93	Test 40 0.1m LiOH 0.9m LiCl p_wH 12.81	Standard 0.5m Cl^-/T p_wH 8.15 (9 min.) 0.5m Cl^-/E p_wH 9.93	Test 41 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/E p_wH 9.93
Time (min.)					
0	-0.8	+30.7	+0.9	+4.7	-0.9
1	-0.2	+28.6	+4.0	+4.0	+0.4
2	-0.1	+28.0	+4.7	+3.9	+0.6
5	0.0	+27.7	+5.2	+3.6	+0.6
10	-0.1	+28.1	+5.0	+3.6	+0.4 (8)
15	0.0	+28.6	+5.1	+3.6	
20				+3.7	
25				+3.7	
30		+30.1			
35		+30.6			
		+33.3 (65)			-0.8 (60)
Final	0.0 (17)	+33.7 (70)	+5.1 (17)	+3.7 (28)	-0.8 (66)

Electrode No. 27 12/9/66 (Cont.)

Solution	Test 42 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/E p_wH 9.93 (8 min.) 0.5m Cl^-/T p_wH 8.15
Time (min.)		
0	+4.1	-1.6
1	+3.1	-0.2
2	+2.7	+0.1
5	+2.4	+0.2
10	+2.3	0.0
15		0.0
20		
25	+2.3	
Final	+2.3 (26)	0.0 (16)

Electrode No. 27 15/9/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5m Cl^-/T p_wH 8.15	Test 44 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/T p_wH 8.15	Test 45 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5m Cl^-/T p_wH 8.15 (7 min.) 1.85m $MgSO_4$ p_wH 8.43
Time (min.)					
0	-2.0	+5.9	-1.8	+3.7	-1.1
1	-0.1	+3.3	+0.3	+3.0	+0.1
2	+0.2	+2.9	+0.6	+2.7	+0.3
5	+0.2	+2.6	+0.7	+2.5	+0.4
10		+2.6	+0.7	+2.5	+0.3
15					+0.3
Final	+0.3 (8)	+2.7 (13)	+0.7 (11)	+2.5 (10)	+0.3 (15)

Electrode No. 29. Jena HA.

				E_7
2/6/66	Mounted and placed in deionised water.			
17/8/66	HCl	0.5m		0.467
	Potassium Solution	1.0m	p_wH 10.05	
15/9/66	Sodium Solution	1.0m	p_wH 13.00	0.467

Resistance 270 Megohms.

Electrode No. 29 15/9/66 Initial Standard Solution 0.1m H_2SO_4

Solution	Standard $0.5mCl^-/T$ p_wH 8.15	Test 46 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard $0.5mCl^-/T$ p_wH 8.15 (12 min.) 0.1m H_2SO_4	Standard $0.5mCl^-/T$ p_wH 8.15 (7 min.) 0.1m H_2SO_4
Time (min.)				
0	0.0	+10.7	-2.2	-0.1
1	+0.1	+6.9	-1.2	+0.1
2	+0.1	+6.0	-0.9	+0.1
5	+0.1	+4.9	-0.6	+0.1
10		+4.3	-0.5	0.0
15		+3.9	-0.4	+0.1
20		+3.7	-0.4	
25		+3.5		
30		+3.4		
35		+3.3		
40				
45		+2.9		
50		+2.8		
Final	+0.1 (6)	+2.8 (55)	-0.4 (20)	+0.1 (15)

Electrode No. 30. Corning.

2/6/66	Mounted and placed in deionised water.			
				E_7
17/8/66	HCl	0.5m		0.677
	Potassium Solution	1.0m	p_wH 9.13	
12/9/66	Sodium Solution	1.0m	p_wH 13.00	0.678

Resistance 270 Megohms.

Electrode No. 30 12/9/66 Initial Standard Solution

0.1m H_2SO_4

Solution	Standard 0.5mCl^-/T p_wH 8.15 (10 min.) 0.5mCl^-/E p_wH 9.93	Test 43 0.1m NaOH 0.9m NaCl p_wH 13.00	Standard 0.5mCl^-/E p_wH 9.93
Time (min.)			
0	-0.6	+7.4	-2.6
1	-0.4	+3.9	-1.0
2	-0.3	+3.3	-0.7
5	-0.2	+2.6	-0.5
10	-0.2	+2.2	
15	-0.2		
20			
25			
30		+1.7	
35			
40			
45		+1.6	
Final	-0.2 (18)	+1.6 (47)	-0.4 (8)