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APPENDIX A

Y VALUES FOR SOLVENTS

CORRELATION OF SOLVOLYSIS RATES

TABLE XV

SOME Y VALUES FOR SOLVENTS AT 25°C.

Y	Solvent	N_{H_2O}	Reference
-2.402[b]	95% Me_2CO-H_2O	0.178	[a]from t-BuCl, ref. 17, 56;
-3.377[c] -1.549[b]	90%	0.313	
-1.797[c] -0.527[b]	80%	0.506	[b]from t-BuBr, ref. 5, 18, 57;
-0.945[c] 0.205[b]	70%	0.637	
3.449[a]	5%	0.987	[c]from benzhydryl chloride, ref. 7a, 58.
1.292[a]	Dioxane (48.61 wt. % H_2O)		
-1.974[a]	100% EtOH	0.000	
-0.727[a]	90% EtOH-H_2O	0.262	
0.000[a]	80%	0.448	
0.644[a]	70%	0.582	
1.139[a]	60%	0.684	
1.604[a]	50%	0.765	
2.151[a]	40%	0.829	

TABLE XVI

SOME Y VALUES FOR SOLVENTS AT 25°C.

Y	Solvent	N_{H_2O}	Reference
2.080[a]	HCOOH (Kahlbaum's*)		[a]from t-BuCl, refs. 17, 56;
-1.052[a]	100% MeOH	0.000	
-0.722[a]	MeOH-H_2O	0.070	[b]from t-BuBr, refs. 5, 18, 57;
-0.329[a]		0.175	
-0.112[a]		0.230	
0.088[a]		0.282	
0.361[a]		0.346	[c]from benzhydryl chloride, refs. 7a, 58.
0.757[a]		0.432	
1.023[a]		0.497	
3.560[a]	H_2O	1.000	

*Containing approximately 0.5% water.

TABLE XVII

CORRELATION OF SOLVOLYSIS RATES*

Compound	Temp., °C.	Solvents[a]	m	log k_o	r
Benzhydryl chloride	25.0	10, 11, 12	.757	-2.779	.004
Benzyl chloride	50.0	1, 2, 3, 5	.425	-5.594	.076
Benzyl p-toluene-sulfonate	25.05	1, 2, 5	.394	-3.449	.077
trans-2-Bromo-cyclohexyl-p-bromo-benzene-sulfonate	50.0	1, 2, 3, 5, 6	.701	-5.159	.016
n-Butyl bromide	59.4	5	.392	-5.972	.026
	75.1	1	.331	-5.419	.034
t-Butyl bromide	25.0	1, 2, 7, 8	.940	-3.472	.021
t-Butyl chloride	25.0	2	1.000	-5.034	
Ethyl ben-zene sulfon-ate	50.0	1, 4, 5, 9	.279	-4.781	.037
Ethyl bromide	55.0	1, 2, 3, 4	.343	-5.898	.053
Ethyl p-toluene-sulfonate	50.0	1, 2, 3, 5	.262	-5.062	.024
iso-Propyl bromide	50.0	1, 2, 3, 4	.544	-5.906	.030
iso-Propyl bromo-benzene-sulfonate	70.0	1, 2, 5	.408	-2.750	.036
trans-2-Methoxy-cyclohexyl-p-bromo-benzene sulfonate	50.0	1, 2, 3, 5, 6	.493	-5.539	.067

TABLE XVIII

CORRELATION OF SOLVOLYSIS RATES*

Compound	Temp., °C.	Solvents[a]	m	log k_o	r
alpha-Methylallyl chloride	25.0	....	.894	-6.314	.052
Methylbenzenesulfonate	50.0	1, 4, 5	.228	-4.536	.001
Methyl bromide	50.0	1, 2, 3, 4	.258	-5.779	.113
alpha-Methylneopentyl-p-bromobenzenesulfonate	70.0	....	.706	-2.837	.096
Neopentyl bromide	95.0	....	.712	-7.248	.059
alpha-Phenylethyl chloride	50.0	....	1.195	-3.808	.072

[a]Solvents: 1, ethanol; 2, 80% ethanol; 3, 50% ethanol; 4, water; 5, methanol; 6, acetic acid; 7, 90% ethanol; 8, 60% ethanol; 9, 30% ethanol; 10, 90% acetone; 11, 85% acetone; 12, 80% acetone.

*The values recorded are to be used in the relation: $\log k = mY + \log k_o$. (Y values were given in tables XV and XVI.) The fit of the data to this relation is the probable error (r) in log k.

APPENDIX B

CORRELATION DATA

FOR CONSTRUCTION OF

FIGURES 2a-d, 10

KEY TO CORRELATION DATA TABLES

The asterisk (*) indicates that the recorded value was calculated from the reference indicated by the small letter given as a superscript, e.g., *[b], means calculated from data found in reference "b." When a capital letter follows the asterisk, the symbol indicates that the value recorded was calculated by a graphical interpolation method.

The small or capital letters given as superscripts refer to the following references--please see the literature cited: b, reference no. 51, G. Akerlof; d, reference no. 55, J. Wyman Jr.; e, reference no. 54, Harned and Owen, p. 118; f, reference no. 55, International Critical Tables, vol. VI, p. 86.

TABLE XIX

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric (D) Constant and Temp., °C.	k (units) multiplied by 10^{-n}	Ref. (see lit. cited)
Methyl bromide				
0.05M	80% aq. EtOH	27.21;*b 55°	3.49(sec.$^{-1}$) 6	18
0.18M	50%	31.8;*b 100.2	2.74(min.$^{-1}$) 2	57
0.18M	HCOOH	100.2	8.42 (hr.$^{-1}$) 3	57
	5% H_2O		1.67 (hr.$^{-1}$) 2	57
	10% H_2O		2.76 (hr.$^{-1}$) 2	57
0.07-0.16M	EtOH	21.45;e,*f 50	3.93 (sec.$^{-1}$) 7	23
0.05-0.10M	80% EtOH	28.10;b 50	2.19 (sec.$^{-1}$) 6 ($E^{\pm}$ =19.6 kcal./mole k= 3.49×10^{-6} at 55°)	5
0.036-0.018M	H_2O	69.94;*d 50	1.05(sec.$^{-1}$) 5	23
0.04-0.07M	50% EtOH	42.92;b 50	5.66 (sec.$^{-1}$) 6	23, 59

($E^{\pm}$ =20.7kcal. at 95°, k = 2.86×10^{-4})

TABLE XX

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constants; Temp., °C.	k(units)10^{n};n	Ref.	$E^{\pm}$ kcal. $mole^{-1}$
Ethyl bromide					
0.05M	80% Me_2CO	26.0;*b 50.6°	2.64($sec.^{-1}$); 5	(5, p. 934)	.....
	90%	21.25;*b	5.83 8		
0.18M	HCOOH	..... 100.2°	1.45($hr.^{-1}$); 2	(57, p. 948)	.....
	10%		3.15		
0.05M	80% EtOH .07N NaOH	27.21;*b 55.0°	1.39($sec.^{-1}$); 6 1.71($sec.^{-1}$ $g\text{-}mole^{-1}$ l.)	(5, p. 931)	.....
	100% EtOH NaOH	20.82;*f	1.97 3	(60, p. 899)	....
	100% EtOH	20.82;*f	2.37($sec.^{-1}$);7	(67, p. 2052)	....
0.03-05M	50%	41.79;*b 55.0°	5.25 6	(59, p. 164)	
		d* 94.85°	(1.41 4)		19.8
0.006-.012 M	H_2O	68.32; 55.0°	1.83 5	(23, p. 2702)	....
	Pyridine*	148.8°	3.00 k_1 3 2.00 k_2	(61, p. 1025)	...

* The literature should be consulted.

TABLE XXI

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant; Temp., °C.	n	$k(10^{n})$ units	$E^{\pm}$ kcal. $mole^{-1}$	Ref.
Isopropyl bromide						
0.18M	HCOOH	..... 100.2°	2	3.79 $hr.^{-1}$	....	57, p. 948
	10% H_2O	.....		6.19	....	
0.05M	80% EtOH	27.21; *b 55.0°	6	2.37 $sec.^{-1}$	....	5, p. 931
	NaOH		5	4.75 $sec.^{-1}$ g-$mole^{-1}$ liter	....	
0.2 M -.01M	EtOH	21.45; e, *f 50.0°	7	1.12 $sec.^{-1}$	....	23, p. 2702
0.02M -.04M	80% EtOH	28.10; b	6	1.18	....	
0.02 M-.03M	50% EtOH	42.92; b	6	8.45	....	
0.001M-.003 M	H_2O	69.94; *d	4	1.16	....	
0.1 M	80% EtOH*	28.10; b	1	2.45 $hr.^{-1}$	....	3a, p. 234
....	Pyridine	148.8°	3	3.00 (k_1)		
			1	1.29 (k_2)	....	61, p.1025
....	Pyridine*	148.8°	3	3.00 (k_1)	....	
			1	1.29 (k_2)		

* The literature should be consulted.

TABLE XXII

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant	Temp., °C.	n	$k(10^{\pm n})$	units	$E^{\pm}$ kcal. $mole^{-1}$	Ref.
n-Butyl bromide 0.09M	EtOH NaOEt (.1038N)	20.82;*f	55.0°	4	4.19	$sec.^{-1}$ $g\text{-}mole^{-1}$ liter	....	62, p. 2060
					4.43	corr.		
0.1	EtOH	17.88;*b	75.1°	3	2.80	$hr.^{-1}$	....	21, p. 258
	12% H_2O	21.31;*B			8.91		....	
	33.3% H_2O	31.05;*b			20.4		....	
	52.3% H_2O	38.33;*b			39.9		....	
0.5	HCOOH	.....	100.0°	6	2.37	$sec.^{-1}$	....	28, p. 943
	5% H_2O	.....			3.39		....	
	10% H_2O	.. ...			4.49		....	
0.1	MeOH	26.06;*b	59.4°	3	1.37	$hr.^{-1}$	....	21, p. 258
	8.5% H_2O	28.95;			2.64		....	
	16.7% H_2O	32.31;			4.16		....	
	20.0% H_2O	32.98;			5.01		....	
	34.5% H_2O	38.80;			8.83		....	
	45.8% H_2O	43.75;*f			13.11		....	
	Pyridine	8.3 ;	148.8°	3	2.00	k_1	....	61, p. 1025
				2	9.4	k_2	....	

TABLE XXIII

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant; Temp., °C.	n	$k(10^{+n})$ units	$E^{\pm}$ kcal. $mole^{-1}$	Ref.
t-Butyl bromide						
0.15M	Me_2CO	16.98;[b] 50°			....	18, p. 919
		18.7 ;[f]				
0.1 M	95%	21.6 ;[b] 25°	6	2.10 $sec.^{-1}$	22.7	22, p. 847
	90%	24.0 ;[e]	5	1.27	20.8	8; 22
	80%	29.6 ;[e]	4	1.10	20.8	22, p. 847
		29.62;[b]			....	
	70%	35.70;[e, b]	4	5.15	....	8, p. 963
	90%	21.26;[b] 50°	4	2.08	....	
0.05M		21.25;[b] 50.6°	3	2.07	....	5, p. 934
	80%	26.0 ;[*b]		1.76	....	
	EtOH	24.3 ;[*b, e]				
		25.0°	6	5.69	23.0	22, p. 847
	90%	28.0 ;[*B]				
		28.1 ;[e]	5	7.14	....	5, p. 934
	80%+[NaOH	32.7 ;[*b]	4	3.57 x	....	5
	80% .14N]	32.8 ;[e]	4	3.63 $sec.^{-1}$	22.8	5, 22
	76.5%	35.45;[*B]	2	3.13	22.5	22
	60%	43.4 ;[e] 43.5[*B]	3	3.76	21.7	5, 22

[x]Units: $sec.^{-1} g\text{-}mole^{-1} liter$.

TABLE XXIV

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant Temp., °C.	n	$k(10^{\pm n})$ units	$E^{\pm}$ kcal. mole^{-1}	Ref.
t-Butyl bromide	80% EtOH	27.21; *b 55°	2	1.01 sec.$^{-1}$	.....	5, p. 931-934
	NaOH		2	1.01 sec.$^{-1}$ g-mole^{-1} liter	.....	5, p. 931-934
.05 M	80% EtOH	37.1; *B 0.1°	5	1.16 sec.$^{-1}$	.....	5, p. 931-934
	60%	48.8; *B	4	1.33	.....	5, p. 934
	$MeOH-H_2O$	*F 25.0°			.....	17, p. 881
	Pyridine	8.3; 148.8°	0	1.75	.....	61, p. 1025
		..... 92.0°	2	1.97	.....	
t-Butyl chloride	EtOH	24.96; *f 25.0°	8	9.70	25.97	22, p. 847
	90% EtOH	28.1; e	6	1.73		
		28.0; *b				
	80%	32.8; e	6	9.24	23.06	
	80%	32.7; *b				
	70%	38.0; *B	5	4.07		
	60%	43.4; e				
		43.5; *B	4	1.27		
	50%	49.1; *B	4	3.67	22.92	
	40%	55.0; *B	3	1.29		

TABLE XXV

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant Temp., $^{o}C.$	n	$k(10^{+n})$ units	$E^{\pm}$ kcal mole^{-1}	Ref.
t-Butyl chloride	80% Me_2CO	29.62[e, b] 25.6°	6	1.94 $sec.^{-1}$	22.6	22, p. 847
	5%		2	2.57	....	
	Dioxane				22.8	
	(48.61 wt.% H_2O)	....	4	1.81	....	
	MeOH	31.51[*b]	7	8.20	25.0	
	N H_2O .070	....	6	1.75		
	.175	....		4.33		
	.230	....		7.14		
	.282	....	5	1.13		
	.346	....		2.12		
	.432	....		5.28		
	.497	....		9.57		
	H_2O	78.5[e]; 78.54[*d]	2	3.30		
	HCOOH	....	3	1.10	22.9	
	AcOH, 0.025M KOAc	....	7	2.13	26.43	
(N_{AcOH} 0.042)	AcOH-Ac_2O 0.017M KOAc	....	9	4.77	26.4	

TABLE XXVI

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant Temp., °C.	n	$k(10^{+n})$ units	$E^{\pm}$ kcal. $mole^{-1}$	Ref.
Benzyl chloride						
0.04-0.1 M	EtOH	21.45;[e, *f]				
		20.87;[b] 50°	7	3.14 $sec.^{-1}$	....	23, p. 2702
	MeOH	69.85;[b]	6	1.23	....	
0.03-0.1	80% EtOH	28.10;[b]	6	2.22	....	
0.04-0.1	50%	42.92;[b]	5	1.22	....	
Diphenylmethyl-chloride	EtOH	24.3 ;[*b, e] 25°		5.30	....	
	90% EtOH	28.1 ;[e]				
		28.0 ;[*b]	4	4.90	....	22, p. 846
	80%	32.8 ;[e]				
		32.7 ;[*b]	3	1.72	....	
	90% Me_2CO	23.96;[b]			19.6	
		24.0 ;[e]	6	4.60	....	
	80%	29.62;[b, e]	5	7.24	21.0	
	70%	35.7 ;[b, e]	4	3.20	....	

TABLE XXVII

CORRELATION DATA**

Halide and Initial Concentration	Solvent	Dielectric Constant Temp., °C.	n	$k(10^{\pm n})$ units	$E^{\pm}$ kcal. $mole^{-1}$	Ref.
alpha-Chloroethyl-benzene	EtOH	20.87;[b] 25°				
		21.45;[e, *f]	7	5.85	21.9	22, p. 847
	80% EtOH	28.10;[b]	4	1.64	21.4	
	MeOH	69.85;[b]	6	7.06	21.7	
	80% Me_2CO	26.20;[b]	6	1.44	21.8	
	60%	37.04;[b]	5	4.19	21.5	
	AcOH, 0.2M KOAc	.....	6	3.90	....	
p, p'-Dimethyl-benzhydryl chloride						
0.05 M	90% Me_2CO	26.5 ;[*B] 0°	5	7.45	....	64, p. 975
0.04 M	85%	29.7 ;[*B]	4	6.07	....	
	80%	32.9 ;[*B]	3	1.18	....	

APPENDIX C

DATA FOR THE CALCULATION OF SOLVOLYTIC RATE CONSTANTS

RUN 2: Data for the Calculation of Rate Constant k_2^*

t min.	a(b-x)	b(a-x)	$\frac{b(a-x)}{a(b-x)}$	$\log\frac{b(a-x)}{a(b-x)}$	$\ln\frac{b(a-x)}{a(b-x)}$	t(a-b)	$k_2 \cdot 10^2$
0	.015091	.015091	1.0				
61	.012272	.012864	1.048	.02036	.04689	1.769	2.65*
94	.011291	.012088	1.071	.02979	.06861	2.726	2.52
112	.010655	.011586	1.087	.03623	.08348	3.248	2.57
124	.010268	.011280	1.098	.04060	.09350	3.596	2.60
153	.010199	.011226	1.101	.04179	.09624	4.437	2.17
166	.010310	.011313	1.097	.04021	.09260	4.814	1.92
171	.009715	.010844	1.116	.04766	.10976	4.959	2.21
197	.009494	.010669	1.124	.05077	.11692	5.713	2.05
						avg.	2.34

*Units: mole liter^{-1} min.$^{-1}$
(a-b) = .0290; a = .1382 N; b = .1092 M; x = [bromide ion] formed in time t.

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 3: Data for the Calculation of Rate Constant k_2^*

$t_{min.}$	$a(b-x)$	$b(a-x)$	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	$t(a-b)$	$k_2 \cdot 10^2$
0	.01468	.01468	1.0				
57	.01217	.01318	1.083	.03463	.07975	1.288	6.19*
251	.00793	.00955	1.204	.08063	.18569	5.673	3.27
311	.00697	.00891	1.278	.10653	.24534	7.029	3.49
335	.00662	.00849	1.282	.10789	.24847	7.571	3.28
366	.00632	.00790	1.250	.09691	.22318	8.272	2.70
388	.00609	.00768	1.261	.10072	.23196	8.769	2.64
412	.00606	.00742	1.224	.08778	.20216	9.311	2.17
444	.006025	.00718	1.192	.07628	.17567	10.034	1.75
470	.00555	.00694	1.250	.09691	.22318	10.622	2.10

*Units: mole $liter^{-1}$ $min.^{-1}$
$(a-b) = .0226$; $a = .1330$ N; $b = .1104$ M; $x = [Br^-]$ detected after time t.

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 3: Data for the Calculation of Rate Constant k_2^*

$t_{min.}$	$a(b-x)$	$b(a-x)$	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	$t(a-b)$	$10^2 k_2$
481	.00535	.00690	1.290	.11059	.25469	10.871	2.34
582		.00627	1.362	.13418	.30902	13.153	
583	.004602					13.176	2.34
633		.00599	1.313	.11826	.27235	14.306	
634	.004562					14.328	1.90
676		.00574	1.370	.13672	.31487	15.278	2.06
678	.004189					15.323	
1440	.002873	.00495	1.723	.23629	.54418	32.544	1.67
1473	.002793					33.290	-----

avg. $k_{2(t_2 - t_{18})}$ 2.44

avg. $k_{2(t_3 - t_{16})}$ 2.17

*Units: mole liter^{-1} min.$^{-1}$

$(a-b) = .0226$; $a = .1330$ N; $b = .1104$ M; $x = [Br^-]$ detected after time t.

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 4: Data for the Calculation of Rate Constant k_2 *

$t_{min.}$	$a(b-x)$	$b(a-x)$	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	$t(a-b)$	$10^2 k_2$
0	.017027	.017027	1.0				
42	.014757	.016117	1.092	.03822	.08802	1.781	4.94
58	.014189	.015773	1.112	.04610	.10617	2.459	4.32
74	.013622	.015262	1.120	.04922	.11335	3.137	3.61
88	.013330	.014807	1.111	.04571	.10527	3.731	2.82
177	.011459	.013176	1.150	.06070	.13979	7.505	1.86
195	.011075	.012843	1.169	.06408	.14758	8.268	1.78
238	.010155	.012487	1.230	.08991	.20706	10.09	2.05
252	.010063	.012365	1.229	.08955	.20623	10.68	1.93
363	.008912	.012210	1.370	.13672	.31487	15.39	2.04
374	.008682	.010656	1.227	.08884	.20460	15.86	1.29

* Units: mole liter^{-1} min.$^{-1}$
$(a-b) = .0424$; $a = .1534$ N; $b = .1110$ M; $x = [Br^-]$ detected after time t.

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 4: Data for the Calculation of Rate Constant k_2 *

$t_{min.}$	$a(b-x)$	$b(a-x)$	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	$t(a-b)$	$10^2 k_2$
437	.007348	.010079	1.372	.13735	.31632	18.53	1.71
475	.007210	.009735	1.350	.13033	.30015	20.14	1.49
492	.007072	.009535	1.348	.12969	.29868	20.86	1.43
536	.006565	.009035	1.376	.13862	.31924	22.73	1.40
552	.006381	.009002	1.411	.14953	.34437	23.40	1.47
599	.006059	.008924	1.473	.16820	.38736	25.40	1.52
618	.005937	.008880	1.496	.17493	.40286	26.20	1.54
658	.005768	.008780	1.522	.18241	.42009	27.90	1.50
672	.005706	.008713	1.527	.18384	.42338	28.49	1.48
741	.005660	.008392	1.482	.17085	.39347	31.42	1.25
753	.005124						
						avg. $(t_6 - t_{21})$	1.61

*Units: mole liter^{-1} min.$^{-1}$

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 7: Data for the Calculation of Rate Constant k_2 *

$t_{min.}$	a(b-x)	b(a-x)	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	t(a-b)	$10^2 k_2$
0	.016968	.016968	1.0				
30							-----
140	.012163	.013818	1.136	.05538	.12754	5.8940	2.16
220	.010404	.012631	1.214	.08422	.19396	9.2620	2.09
309	.009440	.011644	1.233	.09096	.20947	13.0089	1.61
412	.007864	.010303	1.313	.11826	.27235	17.3452	1.57
579	.006181	.008961	1.449	.16107	.37094	24.3759	1.52
7 03	.005661	.007985	1.410	.14922	.34365	29.5963	1.16
790	.004743	.007353	1.550	.19033	.43830	33.2590	1.31
870	.004131	.006987	1.691	.22814	.52506	36.6270	1.43
						avg.	1.61

*Units: mole liter^{-1} min.^{-1}
(a-b) = .0421; a = .1530 N; b = .1109 M; x = $[Br^-]$ detected after time t.

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 5: Data for the Calculation of Rate Constant k_2*

$t_{min.}$	a(b-x)	b(a-x)	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	t(a-b)	$10^2 k_2$
0	.050251	.050251	1.0				
72	.044981					.18727	
73		.047467	1.055	.02325	.05354	.1898	28.21
153		.045310	1.042	.01787	.04115	.3978	10.34
154	.043464					.4004	
206	.042165		1.046	.01953	.04498	.53562	8.40
208		.044126				.5408	
272	.041154	.042386	1.030	.01284	.02957	.7072	4.18
328	.040143	.041621	1.037	.01578	.03634	.8528	4.26
414	.038627	.039950	1.034	.01452	.03344	1.0764	3.11
450	.038194	.039254	1.028	.01199	.02761	1.1700	2.36
511	.037039	.037584	1.015	.00647	.01490	1.3286	1.12
836	.032129	.033826	1.053	.02243	.05166	2.1736	2.37
889	.031624	.033060	1.045	.01912	.04403	2.3114	1.90
1055	.029313	.030067	1.026	.01115	.02568	2.7430	0.93
						avg.	6.11

*Units: mole liter^{-1}min.$^{-1}$ See following table for formula.
(a-b) = .0026; a= .0722 N; b=.0696 M; x =Br^- detected after time t.

RUN 6: Data for the Calculation of Rate Constant k_2*

$t_{min.}$	$a(b-x)$	$b(a-x)$	$\frac{b(a-x)}{a(b-x)}$	$\log \frac{b(a-x)}{a(b-x)}$	$\ln \frac{b(a-x)}{a(b-x)}$	$t(a-b)$	$10^3 k_2$
0	.045782	.045782	1.0				
112	.042720	.042888	1.004	.00173	.00398	.7728	5.15
370	.038306	.039544	1.032	.01368	.03150	2.5530	12.34
582	.035529	.036651	1.032	.01368	.03150	4.0158	7.84
670	.033606	.034786	1.035	.01494	.03441	4.6230	7.44
735	.032752	.034143	1.042	.01787	.04115	5.0715	8.11
790	.032254	.033693	1.045	.01912	.04403	5.4510	8.07
1022	.028836	.030928	1.072	.03019	.06953	7.0518	9.85
1125	.027839	.029771	1.069	.02898	.06674	7.7625	8.50
						avg.	8.41

*Units: mole $liter^{-1}$ $min.^{-1}$

$(a-b) = .0069$; $a = .0712$ N; $b = .0643$ M; $x = [Br^-]$ detected after time t.

$$k_2 = \frac{2.303}{t(a-b)} \log \frac{b(a-x)}{a(b-x)}$$

RUN 2: Data for the Calculation of Rate Constant $k_{1(a-x)}$ *

$t_{min.}$	$\frac{a}{a-x}$	$\log \frac{a}{a-x}$	$\ln \frac{a}{a-x}$	$k_{1(a-x)} \cdot 10^3$
0	1.0			
61	1.173	.06930	.1596	2.61
94	1.248	.09621	.2215	2.36
112	1.302	.11461	.2639	2.36
124	1.338	.12646	.2912	2.35
153	1.344	.12840	.2957	1.93
166	1.334	.12516	.2882	1.74
171	1.392	.14364	.3308	1.93
197	1.414	.15045	.3465	1.76
			avg.	2.13

* Units: min.^{-1}

$$k_{1(a-x)} = \frac{2.303}{t} \log \frac{a}{a-x}$$

RUN 3: Data for the Calculation of Rate Constant $k_{1(a-x)}$ *

t min.	$\frac{a}{a-x}$	$\log \frac{a}{a-x}$	$\ln \frac{a}{a-x}$	$k_{1(a-x)} \cdot 10^3$
0	1.0			
57	1.114	.04689	.1080	1.89
251	1.537	.18667	.4299	1.71
311	1.648	.21696	.4997	1.61
335	1.729	.23779	.5476	1.63
366	1.857	.26881	.6191	1.69
388	1.911	.28126	.6477	1.66
412	1.979	.29645	.6827	1.66
444	2.046	.31091	.7160	1.61
470	2.114	.32510	.7487	1.59
481	2.128	.32797	.7553	1.57
582	2.341	.36940	.8507	1.46
583				
633	2.449	.38899	.8958	1.41
634				
676	2.558	.40790	.9394	1.38
678				
1440	2.969	.47261	1.0884	0.07
1473	3.009	.47842	1.1018	0.07
		avg.	$(t_2 - t_{16})$	1.60

* Units: $min.^{-1}$

$$k_{1(a-x)} = \frac{2.303}{t} \log \frac{a}{a-x}$$

RUN 4: Data for the Calculation of Rate Constant $k_{1(a-x)}$*

$t_{min.}$	$\frac{a}{(a-x)}$	$\log \frac{a}{(a-x)}$	$\ln \frac{a}{(a-x)}$	$10^3 \cdot k_{1(a-x)}$
0	1.0			
42	1.056	.02366	.0545	1.30
58	1.079	.03302	.0760	1.31
74	1.116	.04766	.1098	1.48
88	1.150	.06070	.1398	1.59
177	1.292	.11126	.2562	1.45
195	1.326	.12254	.2822	1.45
238	1.363	.13450	.3097	1.30
252	1.377	.13893	.3199	1.27
363	1.575	.19728	.4543	1.25
374	1.598	.20358	.4688	1.25
437	1.689	.22763	.5244	1.20
475	1.749	.24279	.5591	1.18
492	1.786	.25188	.5801	1.18
536	1.884	.27508	.6335	1.18
552	1.891	.27669	.6372	1.15
599	1.908	.28058	.6462	1.07
618	1.917	.28262	.6509	1.05
658	1.939	.28758	.6623	1.01
672	1.954	.29092	.6699	1.00
741	2.029	.30728	.7077	0.95
753				-----
			avg.	1.23

*Units: mole liter^{-1} min.$^{-1}$/ mole liter^{-1}

$$k_{1(a-x)} = \frac{2.303}{t} \log \frac{a}{a-x}$$

RUN 7: Data for the Calculation of Rate Constant $k_{1(a-x)}$ *

$t_{min.}$	$\frac{a}{a-x}$	$\log \frac{a}{a-x}$	$\ln \frac{a}{a-x}$	$k_{1\,(a-x)} \cdot 10^3$
0	1.0			
30	1.036	.01536	.0354	1.18
140	1.228	.08920	.2054	1.46
220	1.343	.12808	.2949	1.34
309	1.457	.16346	.3764	1.21
412	1.657	.21669	.4990	1.21
579	1.893	.27715	.6383	1.10
703	2.186	.33965	.7822	1.11
790	2.308	.36324	.8365	1.05
870	2.428	.38525	.8872	1.01
			avg.	1.18

*Units: $min.^{-1}$

$$k_{1\,(a-x)} = \frac{2.303}{t} \log \frac{a}{a-x}$$

RUN 5: Data for the Calculation of Rate Constant $k_{1(a-x)}$ *

$t_{min.}$	$\frac{a}{a-x}$	$\log \frac{a}{a-x}$	$\ln \frac{a}{a-x}$	$k_{1(a-x)} \cdot 10^4$
0	1.0			
72				
73	1.059	.02490	.0573	7.84
153	1.109	.04493	.1035	6.76
154				
206				
208	1.139	.05652	.1302	6.25
272	1.185	.07372	.1698	6.16
328	1.207	.08171	.1882	5.73
414	1.258	.09968	.2296	5.54
450	1.280	.10721	.2469	5.48
511	1.337	.12613	.2905	5.68
836	1.485	.17173	.3955	4.73
889	1.520	.18184	.4188	4.71
1055	1.671	.22298	.5135	4.86
			avg.	5.80

* Units: $min.^{-1}$

$$k_{1(a-x)} = \frac{2.303}{t} \log \frac{a}{a-x}$$

RUN 6: Data for the Calculation of Rate Constant $\bar{k}_{1(a-x)}$ *

t min.	$\frac{a}{a-x}$	$\log \frac{a}{a-x}$	$\ln \frac{a}{a-x}$	$\bar{k}_{1(a-x)} \cdot 10^4$
0	1.0			
112	1.067	.02816	.0648	5.78
370	1.158	.06371	.1467	3.96
582	1.249	.09656	.2224	3.82
670	1.316	.11926	.2746	4.09
735	1.341	.12743	.2934	3.99
790	1.359	.13322	.3068	3.88
1022	1.480	.17026	.3921	3.83
1125	1.538	.18696	.4306	3.82
			avg.	4.15

* Units: min.^{-1}

$$\bar{k}_{1(a-x)} = \frac{2.303}{t} \log \frac{a}{a-x}$$

RUN 2: DATA FOR THE CALCULATION OF RATE CONSTANTS k_2' and k_1*

$t_{min.}$	$10^3 k_{1(b-x)}$	$\frac{b}{b-x}$	$\log \frac{b}{b-x}$	$\ln \frac{b}{b-x}$	$t(a-x)$	$(a-x)$	$10^2 k_2'$
0		1.0				.1382	
61	3.51	1.230	.09307	.2143	5.4168	.1178	3.95
94	3.08	1.336	.12581	.2897	7.6798	.1107	3.77
112	3.11	1.416	.15106	.3479	8.6352	.1061	4.02
124	3.11	1.470	.16732	.3853	9.2132	.1033	4.18
153	2.55	1.480	.17026	.3921	11.2914	.1028	3.47
166	2.30	1.464	.16554	.3812	12.3836	.1036	3.07
171	2.57	1.553	.19117	.4403	12.0213	.0993	3.66
197	2.35	1.589	.20112	.4632	13.5339	.0977	3.42
avg.	2.82					avg.	3.69

b = .1092 M.

*Units: k_2', mole liter^{-1} min.$^{-1}$; $k_{1(b-x)}$, min.$^{-1}$. See following table for formulas.

RUN 3: Data for the Calculation of Rate Constants k_2' and $k_{1(b-x)}$*

$t_{min.}$	$10^3\ k_{1(b-x)}$	$\frac{b}{(b-x)}$	$\log \frac{b}{(b-x)}$	$\ln \frac{b}{(b-x)}$	t(a-x)	(a-x)	$10^2\ k_2'$
0		1.0				.1330	
57	3.20	1.206	.08135	.1873	6.8058	.1194	2.75
251	2.45	1.852	.26764	.6164	21.7115	.0865	2.83
311	2.40	2.107	.32366	.7454	25.0977	.0807	2.96
335	2.37	2.217	.34577	.7963	25.7615	.0769	3.09
366	2.30	2.324	.36624	.8434	26.2056	.0716	3.21
388	2.27	2.410	.38202	.8798	27.0048	.0696	3.25
412	2.15	2.421	.38399	.8843	27.6864	.0672	3.19
444	2.01	2.437	.38686	.8909	28.8600	.0650	3.08
470	2.07	2.647	.42275	.9736	29.5630	.0629	3.29

*Units: mole liter^{-1} min.$^{-1}$ for k_2' ; min.$^{-1}$ for $k_{1(b-x)}$

$$k_2' = \frac{2.303}{t(a-x)} \log \frac{b}{b-x}; \quad k_{1(b-x)} = \frac{2.303}{t} \log \frac{b}{b-x} \quad ; \ b = .1104\ M.$$

RUN 3: Data for the Calculation of Rate Constants k_2' and $k_{1(b-x)}$ *

$t_{min.}$	$10^3 k_{1(b-x)}$	$\frac{b}{(b-x)}$	$\log \frac{b}{(b-x)}$	$\ln \frac{b}{(b-x)}$	$t(a-x)$	$(a-x)$	$10^2 k_2'$
481	2.10	2.746	.43870	1.0103	30.0625	.0625	3.36
582						.0568	
583	1.90	3.191	.50393	1.1605	33.0576		3.51
633						.0543	
634	1.84	3.219	.50772	1.1690	34.3719		3.40
676						.0520	
678	1.85	3.505	.54469	1.2544	35.1520		3.56
1440	1.13	5.111	.70851	1.6317	64.5120	.0448	2.52
1473	1.15	5.257	.70274	1.6599			

	avg. $(t_2 - t_{17})$	$(t_3 - t_{17})$
	2.11	2.19

$(t_2 - t_{18})$	3.14
$(t_2 - t_{17})$	3.20
avg. $(t_3 - t_{17})$	3.22

* Same as preceding table.

RUN 4: Data for the Calculation of Rate Constants k_2' and $k_{1(b-x)}$

$t_{min.}$	$10^3\ k_{1(b-x)}$	$\frac{b}{b-x}$	$\log \frac{b}{b-x}$	$\ln \frac{b}{b-x}$	$t(a-x)$	$(a-x)$	$10^2\ k_2'$
0		1.0				.1534	----
42	3.41	1.154	.06221	.1433	6.0984	.1452	2.34
58	3.14	1.200	.07918	.1823	8.2418	.1421	2.21
74	3.02	1.250	.09691	.2232	10.1750	.1375	2.19
88	2.78	1.277	.10619	.2445	11.7392	.1334	2.08
177	2.24	1.486	.17202	.3962	21.0099	.1187	1.88
195	2.20	1.537	.18667	.4299	22.5615	.1157	1.90
238	2.17	1.677	.22453	.5171	26.7750	.1125	1.93
252	2.09	1.692	.22840	.5260	2 8.0728	.1114	1.87
363	1.78	1.910	.28103	.6472	39.9300	.0974	1.62
374	1.802	1.961	.29248	.6736	35.9040	.0960	1.87
437	1.92	2.317	.36493	.8404	39.6796	.0908	2.11
475	1.80	2.363	.37328	.8597	41.6575	.0877	2.06
492	1.78	2.408	.38166	.8790	42.2628	.0859	2.07
536	1.78	2.593	.41380	.9530	43.6304	.0814	2.18
552	1.77	2.668	.42619	.9815	44.7672	.0811	2.19
599	1.72	2.810	.44871	1.0334	48.1596	.0804	2.14

RUN 4: Data for the Calculation of Rate Constants k_2' and $k_{1(b-x)}$ *

$t_{min.}$	$10^3 k_{1(b-x)}$	$\frac{b}{b-x}$	$\log \frac{b}{b-x}$	$\ln \frac{b}{b-x}$	$t(a-x)$	$(a-x)$	$10^2 k_2'$
618	1.70	2.868	.45758	1.0538	49.4400	.0800	2.13
658	1.64	2.952	.47012	1.0827	52.0478	.0791	2.08
672	1.62	2.984	.47480	1.0935	52.7520	.0785	2.07
741	1.48	3.008	.47828	1.1015	56.0196	.0756	1.97
753	1.59	3.323	.52153	1.2011			
	avg. 2.07						avg. 2.04
RUN 7:							
0		1.0				.1530	
140	2.37	1.395	.14457	.3329	17.444	.1246	1.90
220	2.22	1.631	.21219	.4887	25.058	.1139	1.95
309	1.89	1.797	.25455	.5862	32.445	.1050	1.81
412	1.87	2.157	.33385	.7688	38.275	.0929	2.01
579	1.74	2.745	.43854	1.0099	46.7832	.0808	2.16
703	1.56	2.997	.47669	1.0978	50.616	.0720	2.17
790	1.61	3.577	.55352	1.2747	52.377	.0663	2.43
870	1.62	4.107	.61352	1.4129	54.810	.0630	2.58
	avg. 1.86						avg. 2.10

* Units: mole liter^{-1}min.$^{-1}$ for k_2'; min.$^{-1}$ for $k_{1(b-x)}$. See following table for formulas.

RUN 5: Data for the Calculation of Rate Constants k_2' and $k_{1(b-x)}$.*

$t_{min.}$	$10^4 k_{1(b-x)}$		$\frac{b}{b-x}$	$\log \frac{b}{b-x}$	$\ln \frac{b}{b-x}$	$t(a-x)$	$(a-x)$	$10^2 k_2'$
0			1.0				.0722	
72								
73	15.15		1.117	.04805	.1106	4.9786	.0682	2.22
153							.0651	
154	7.41		1.121	.04961	.1142	9.9603		1.14
206								
208	8.44		1.192	.07628	.1756	13.1872	.0634	1.33
272	7.34		1.221	.08672	.1997	16.5648	.0609	1.20
328	6.85		1.252	.09760	.2248	19.6144	.0598	1.14
414	6.36		1.301	.11428	.2632	23.7636	.0574	1.10
450	6.10		1.316	.11926	.2746	25.3800	.0564	1.08
511	5.97		1.357	.13258	.3053	27.5940	.0540	1.10
836	5.35		1.564	.19424	.4473	40.6296	.0486	1.10
889	5.21		1.589	.20112	.4632	42.2275	.0475	1.09
1055	5.11		1.714	.23401	.5389	45.5760	.0432	1.18
avg.	6.56	$(t_5 - t_{14})$					$(t_5 - t_{14})$	1.15
	7.21	$(t_3 - t_{15})$					$(t_3 - t_{15})$	1.24

* Units: same as preceding table.

RUN 6: Data for the Calculation of Rate Constants k_2' and $k_{1(b-x)}$

t min.	$10^4 k_{1(b-x)}$	$\frac{b}{b-x}$	$\log \frac{b}{b-x}$	$\ln \frac{b}{b-x}$	$t(a-x)$	$(a-x)$	$10^3 k_2'$
0		1.0				.0712	
112	6.20	1.072	.03019	.0695	7.4704	.0667	9.30
370	4.81	1.195	.07737	.1782	22.7550	.0615	7.83
582	4.34	1.288	.10992	.2531	33.1740	.0570	7.60
670	4.61	1.362	.13418	.3090	36.2470	.0541	8.50
735	4.55	1.398	.14551	.3351	39.0285	.0531	8.60
790	4.43	1.419	.15198	.3500	41.3960	.0524	8.40
1022	4.52	1.588	.20085	.4625	49.1582	.0481	9.40
1125	4.41	1.644	.21590	.4972	52.0875	.0463	9.50
avg.	4.73					avg.	8.60

* Units: mole liter^{-1} min.$^{-1}$ for k_2'; min.$^{-1}$ for $k_{1(b-x)}$.

$k_2' = \frac{2.303}{t(a-x)} \log \frac{b}{b-x}$; $k_{1(b-x)} = \frac{2.303}{t} \log \frac{b}{b-x}$

Data for the Calculation of the First-order Rate Constants by the Method of Least Squares

$t_{min.}$	(a-x)	(b-x)	t^2	-log(a-x)	-t log(a-x)	-ln(a-x)	-log(b-x)	-t log(b-x)	-ln(b-x)	
0	.1382	.1092	0	(0.85949)	0.0	(1.9794)	(0.96178)	0.0	(2.2150)	RUN 2
61	.1178	.0888	3721	0.92885	56.660	2.1391	1.05159	64.147	2.4218	
94	.1107	.0817	8836	0.95585	89.850	2.2013	1.08778	102.251	2.5051	
112	.1061	.0771	12544	0.97428	109.119	2.2438	1.11295	124.650	2.5631	
124	.1033	.0743	15376	0.98590	122.252	2.2705	1.12901	139.997	2.6001	
153	.1028	.0738	23409	0.98801	151.165	2.2754	1.13194	173.187	2.6068	
166	.1036	.0746	27556	0.98464	163.450	2.2676	1.12726	187.125	2.5961	
171	.0993	.0703	29241	1.00305	171.521	2.3100	1.15304	197.170	2.6554	
197	.0977	.0689	38809	1.01011	198.992	2.3263	1.16304	229.119	2.6785	
0	.1330	.1104	0	(0.87615)	0.0	(2.0178)	(0.95703)	0.0	(2.2040)	RUN 3
57	.1194	.0915	3249	0.92300	52.611	2.1257	1.03858	59.199	2.3918	
251	.0865	.0596	63001	1.06298	266.808	2.4480	1.22475	307.412	2.8206	
311	.0807	.0524	96721	1.09313	339.963	2.5175	1.28067	398.288	2.9494	
335	.0769	.0498	112225	1.11407	373.213	2.5657	1.30277	436.428	3.0003	
366	.0716	.0475	133956	1.14509	419.103	2.6371	1.32331	484.331	3.0476	
388	.0696	.0458	150544	1.15739	449.067	2.6655	1.33913	519.582	3.0840	
412	.0672	.0456	169744	1.17263	483.123	2.7006	1.34104	552.508	3.0884	
444	.0650	.0453	197136	1.18709	527.068	2.7339	1.34390	596.692	3.0950	
470	.0629	.0417	220900	1.20135	564.634	2.7667	1.37986	648.534	3.1778	
481	.0625	.0402	231361	1.20412	576.182	2.7731	1.39577	671.365	3.2144	
582	.0568		338724	1.24565	724.968	2.8687				
583		.0346	339889				1.46092	851.716	3.3645	
633	.0543		400689	1.26520	800.872	2.9137				
634		.0343	401956				1.46471	928.626	3.3732	
676	.0520		456976	1.28400	867.984	2.9570				
678		.0315	459684				1.50169	1018.146	3.4584	
(1440)	(.0448)	(.0216)	(2073600)	(1.34872)		(3.1061)	(1.66555)		(3.8358)	
(1473)		(.0210)	(2169729)				(1.67778)		(3.8639)	
Σ6488(b-x)		(b-x)	2739858	22.88639	7511.605		26.35371	8690.473		
Σ6484(a-x)		(a-x)	2734718	24.62203*			28.27252*			

*Including values in parentheses for t_0.

RUN 4: Data for the Calculation of the First-order Rate Constants by the Method of Least Squares

$t_{min.}$	(a-x)	(b-x)	t^2	-log(a-x)	-t log(a-x)	-ln(a-x)	-log(b-x)	-t log(b-x)	-ln(b-x)
0	.1534	.1110	0	(0.81417)	0.0	(1.8750)	(0.95468)	0.00	(2.1986)
42	.1452	.0962	1764	0.83803	35.197	1.9300	1.01682	42.706	2.3417
58	.1421	.0925	3364	0.84741	49.150	1.9516	1.03386	59.964	2.3810
74	.1375	.0888	5476	0.86170	63.766	1.9845	1.05159	77.818	2.4195
88	.1334	.0869	7744	0.87484	76.986	2.0147	1.06098	93.366	2.4434
177	.1187	.0747	31329	0.92555	163.822	2.1315	1.12668	199.422	2.5947
195	.1157	.0722	38025	0.93667	182.651	2.1571	1.14146	222.585	2.6288
238	.1125	.0662	56644	0.94885	225.826	2.1852	1.17914	280.635	2.7155
252	.1114	.0656	63504	0.95311	240.184	2.1950	1.18310	298.141	2.7247
363	.0974	.0581	131769	1.01144	367.153	2.3293	1.23582	448.603	2.8461
374	.0960	.0566	139876	1.01773	380.631	2.3438	1.24718	466.445	2.8722
437	.0908	.0479	190969	1.04191	455.315	2.3995	1.31966	576.691	3.0392
475	.0877	.0470	225625	1.05700	502.075	2.4343	1.32790	630.752	3.0581
492	.0859	.0461	242064	1.06601	524.477	2.4550	1.33630	657.460	3.0775
536	.0814	.0428	287296	1.08928	583.908	2.5088	1.36856	733.548	3.1518
552	.0811	.0416	304704	1.09098	602.221	2.5125	1.38091	762.262	3.1802
599	.0804	.0395	358801	1.09474	655.749	2.5212	1.40340	840.637	3.2320
618	.0800	.0387	381924	1.09691	677.890	2.5262	1.41229	872.795	3.2525
658	.0791	.0376	432964	1.10182	724.997	2.5375	1.42481	937.525	3.2813
672	.0785	.0372	451584	1.10513	742.647	2.5451	1.42946	960.597	3.2920
741	.0756	.0369	549081	1.12148	831.017	2.5828	1.43297	1061.831	3.3001
(753)		.0334	(567009)				1.47625	1111.616	3.3998
Σ7641 (a-x)		(a-x)	3904507	20.08066	8085.662	46.2456	26.58914	11335.399	61.2321
Σ8394 (b-x)		(b-x)	4471516	20.89486*		48.1206*	27.54382*		63.4307*

* Including values in parentheses for t_o.

RUN 7: Data for the Calculation of the First-order Rate Constants by the Method of Least Squares

$t_{min.}$	(a-x)	(b-x)	t^2	- log(a-x)	-t log(a-x)	-ln(a-x)	-log(b-x)	-t log(b-x)	-ln(b-x)
0	.1530	.1109	0	(0.81531)	0.0	(1.8776)	(0.95507)	0.0	(2.1995)
30	.1477		900	0.83062	24.919	1.9129			
140	.1246	.0795	19600	0.90448	126.627	2.0830	1.09963	153.948	2.5324
220	.1139	.0680	48400	0.94348	207.566	2.1728	1.16749	256.848	2.6887
309	.1050	.0617	95481	0.97881	302.452	2.2542	1.20971	373.800	2.7860
412	.0929	.0514	169744	1.03198	425.176	2.3766	1.28904	531.084	2.9686
579	.0808	.0404	335241	1.09259	632.610	2.5162	1.39362	806.906	3.2095
703	.0720	.0370	494209	1.14267	803.297	2.6316	1.43180	1006.555	3.2974
790	.0663	.0310	624100	1.17849	931.007	2.7141	1.50864	1191.826	3.4744
870	.0630	.0270	756900	1.20066	1044.574	2.7651	1.56864	1364.717	3.6126
4053(a-x)			2544575	9.30178	4498.228	21.4265	10.66857	5681.684	24.5696
4023(b-x)				10.13132*		23.3322*	11.62364*		26.7691*
Σ11694(a-x)		(a-x)	6449082	29.38444	12583.890		37.25771	17017.083	
Σ12417(b-x)		(b-x)	7016091	31.02518*			39.16746*		

*Including values in parentheses for t_o .

Data for the Calculation of First-order Rate Constants by the Method of Least Squares

	(a-x)	(b-x)	t^2	-log(a-x)	-t log(a-x)	- ln(a-x)	-log(b-x)	-t log(b-x)	ln(b-x)	
0	.0722		0	(1.14146)	0.0	(2.6288)	(1.15739)	0.0	(2.6685)	RUN 5
72	(.0682)	.0623	5184	(1.16622)	(83.968)		1.20551	86.797	2.7763	
73	.0682	(.0623)	5329	1.16622	85.134	2.6858	(1.20551)	(88.002)	(2.7763)	
153	.0651	(.0602)	23409	1.18642	181.522	2.7323	(1.22040)	(186.722)	(2.8106)	
154	(.0651)	.0602	23716	(1.18642)	(182.868)		1.22040	187.942	2.8106	
206	(.0634)	.0584	42436	(1.19791)	(246.769)		1.23359	254.119	2.8410	
208	.0634	(.0584)	43264	1.19791	249.165	2.7588	(1.23359)	(256.587)	(2.8410)	
272	.0609	.0570	73984	1.21538	330.583	2.7990	1.24413	338.403	2.8652	
328	.0598	.0556	107584	1.22330	401.242	2.8172	1.25493	411.617	2.8991	
414	.0574	.0535	171396	1.24109	513.811	2.8582	1.27165	526.463	2.9286	
450	.0564	.0529	202500	1.24872	561.924	2.8758	1.27654	574.443	2.9399	
511	.0540	.0513	261121	1.26761	647.749	2.9193	1.28988	659.129	3.9706	
836	.0486	.0445	698896	1.31336	1097.969	3.0247	1.35164	1129.971	3.1120	
889	.0475	.0438	790321	1.32331	1176.422	3.0476	1.35853	1207.733	3.1287	
1055	.0432	.0406	1113025	1.36452	1439.569	3.1425	1.39147	1468.001	3.2045	
0	.0712	.0643	0	(1.14752)	0.0	(2.6415)	(1.19179)	0.0	(2.7467)	RUN 6
112	.0667	.0600	12544	1.17587	131.697	2.7080	1.22185	136.847	2.8139	
370	.0615	.0538	136900	1.21112	448.114	2.7892	1.26922	469.611	2.9230	
582	.0570	.0499	338724	1.24413	724.084	2.8652	1.30190	757.706	2.9983	
670	.0541	.0472	448900	1.26680	848.756	2.9174	1.32606	888.460	3.0539	
735	.0531	.0460	540225	1.27491	937.059	2.9361	1.33724	982.871	3.0797	
790	.0524	.0453	624100	1.28067	1011.729	2.9494	1.34390	1061.681	3.0950	
1022	.0481	.0405	1044484	1.31785	1346.843	3.0350	1.39254	1423.317	3.2070	
1125	.0463	.0391	1265625	1.33442	1501.222	3.0732	1.40782	1583.797	3.2422	
Σ10595(a-x)		(a-x)	7902331	23.85361	13634.594	54.9347	24.69880	14148.908	57.8813	
Σ10593(b-x)		(b-x)	7901665	26.14259*		60.2050*	27.04798*		63.2915*	

* Including values in parentheses for t_0.