

APPENDIX D. Catalyst Deactivation by Phenol--
Tabulated Comparison of Deactivation Rate Equation With Experimental Data

<u>Table No.</u>		<u>Page</u>
D-1	Experimental Data on Deactivation by Phenol (UC-1870-46-1 Catalyst, 1/16-Inch Extrusions)	D-3
D-2	Experimental Data on Deactivation by Phenol (Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)	D-7
D-3	Experimental Data on Deactivation by Phenol (G-93 Catalyst, 4 x 6 Mesh Spheres)	D-11
D-4	Comparison of Experimental and Calculated Deactivation Rate Constants (UC-1870-46-1 Catalyst, 1/16-Inch Extrusions)	D-14
D-5	Comparison of Experimental and Calculated Deactivation Rate Constants (Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)	D-18
D-6	Comparison of Experimental and Calculated Deactivation Rate Constants (G-93 Catalyst, 4 x 6 Mesh Spheres)	D-22

Table D-1, Part 1. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp., °F	P, psia	t, hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r × 10 ⁴ , lb-mol/hr-g	r ₀ × 10 ⁴ , lb-mol/hr-g	a	-Δa/Δθ, a × 10 ⁵ , hr ⁻¹
1	561.0	1015.0	4	594.0	53.6	0.0	0.000	0.000000	0.550	0.550000	1.000000	0.000
2	565.0	1015.0	26	595.0	55.6	0.0	0.000	0.000000	0.620	0.620000	1.000000	0.000
3	565.0	1015.0	30	591.0	55.0	0.0	0.000	0.000000	0.650	0.650000	1.000000	0.000
4	564.0	1015.0	32	581.5	55.7	0.0	0.000	0.000000	0.510	0.510000	1.000000	0.000
5	567.0	1015.0	35	580.5	55.9	0.0	0.000	0.000000	0.600	0.600000	1.000000	0.000
6	562.0	1015.0	38	586.6	55.4	0.0	0.000	0.000000	0.610	0.610000	1.000000	0.000
7	561.0	1015.0	74	580.3	56.7	0.0	0.000	0.000000	0.530	0.530000	1.000000	0.000
8	566.0	1015.0	74	584.9	27.7	0.0	0.000	0.000000	0.590	0.590000	1.000000	0.000
9	563.0	1015.0	52	581.6	28.0	0.0	0.000	0.000000	0.500	0.500000	1.000000	0.000
10	561.0	1015.0	148	588.0	40.1	0.0	0.000	0.000000	0.460	0.460000	1.000000	0.000
11	562.0	1015.0	151	588.0	42.4	0.0	0.000	0.000000	0.530	0.530000	1.000000	0.000
12	564.0	1015.0	154	586.8	43.0	0.0	0.000	0.000000	0.550	0.550000	1.000000	0.000
13	566.0	1015.0	172	583.0	31.7	0.0	0.000	0.000000	0.500	0.500000	1.000000	0.000
14	563.0	1015.0	175	589.6	32.7	0.0	0.000	0.000000	0.560	0.560000	1.000000	0.000
15	560.0	1015.0	175	585.1	32.4	0.0	0.000	0.000000	0.580	0.580000	1.000000	0.000
16	563.0	1015.0	196	580.9	14.3	0.0	0.000	0.000000	0.570	0.570000	1.000000	0.000
17	564.0	1015.0	200	580.9	13.1	0.0	0.000	0.000000	0.620	0.620000	1.000000	0.000
18	563.0	1015.0	204	580.0	13.5	0.0	0.000	0.000000	0.650	0.650000	1.000000	0.000
19	564.0	1015.0	220	580.0	21.0	0.0	0.000	0.000000	0.510	0.510000	1.000000	0.000
20	562.0	1015.0	224	580.0	21.4	0.0	0.000	0.000000	0.570	0.570000	1.000000	0.000
21	560.0	1015.0	244	580.9	15.4	0.0	0.000	0.000000	0.550	0.550000	1.000000	0.000
22	563.0	1015.0	247	580.0	20.0	0.0	0.000	0.000000	0.610	0.610000	1.000000	0.000
23	564.0	1015.0	250	581.1	15.8	0.0	0.000	0.000000	0.620	0.620000	1.000000	0.000
24	565.0	1015.0	310	570.0	7.0	0.0	0.000	0.000000	0.310	0.310000	1.000000	0.000
25	563.0	1015.0	320	564.0	7.1	0.0	0.000	0.000000	0.300	0.300000	1.000000	0.000
26	565.0	1015.0	340	560.0	7.1	0.0	0.000	0.000000	0.330	0.330000	1.000000	0.000
27	563.0	1015.0	343	567.5	11.2	0.0	0.000	0.000000	0.300	0.300000	1.000000	0.000
28	562.0	1015.0	347	560.7	11.1	0.0	0.000	0.000000	0.240	0.240000	1.000000	0.000
29	567.0	1015.0	364	567.0	11.1	0.0	0.000	0.000000	0.230	0.230000	1.000000	0.000
30	565.0	1015.0	367	560.0	6.5	0.0	0.000	0.000000	0.150	0.150000	1.000000	0.000
31	563.0	1015.0	370	560.0	6.2	0.0	0.000	0.000000	0.160	0.160000	1.000000	0.000
32	560.0	1015.0	384	560.4	4.1	0.0	0.000	0.000000	0.140	0.140000	1.000000	0.000
33	569.0	1015.0	392	560.9	3.9	0.0	0.000	0.000000	0.200	0.200000	1.000000	0.000
34	562.0	1015.0	426	567.5	3.9	0.0	0.000	0.000000	0.230	0.230000	1.000000	0.000
35	568.0	1015.0	556	567.4	16.7	11.5	0.000	0.000000	0.700	0.700000	1.000000	0.000
36	567.0	1015.0	560	568.7	16.5	11.1	0.000	0.000000	0.780	0.780000	1.000000	0.000
37	561.0	1015.0	574	567.8	24.1	16.0	0.000	0.000000	0.640	0.640000	1.000000	0.000
38	561.0	1015.0	582	567.0	24.1	16.3	0.000	0.000000	0.700	0.700000	1.000000	0.000
39	562.0	1015.0	584	567.0	24.1	16.2	0.000	0.000000	0.750	0.750000	1.000000	0.000
40	562.0	1015.0	675	565.1	39.5	23.4	0.000	0.000000	0.740	0.740000	1.000000	0.000
41	565.0	1015.0	676	566.7	40.7	23.6	0.000	0.000000	0.830	0.830000	1.000000	0.000

D78113317a

Preceding page blank

D-3



Reproduced from
best available copy.

Table D-1, Part 2. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp. °F	P _T psia	θ, hr	P _{H₂O} psia	P _{CO} psia	P _φ psia	C _{φOH} mol frac.	r x 10 ⁴ lb-mol/hr-g	r ₀ x 10 ⁴ lb-mol/hr-g	a	-Δa/Δθ a x 10 ⁵ hr ⁻¹
42	752.0	515.0	680	267.2	37.1	23.1	0.000000	0.671	0.470000	1.000000	0.000
43	503.0	515.0	747	167.6	57.7	35.4	0.000000	0.690	0.640000	1.000000	0.000
44	511.0	515.0	750	174.3	56.3	35.7	0.000000	0.780	0.780000	1.000000	0.000
45	747.0	515.0	752	176.0	54.0	33.5	0.000000	0.600	0.800000	1.000000	0.000
46	563.0	515.0	819	254.3	43.4	31.6	0.000000	0.720	0.720000	1.000000	0.000
47	555.0	515.0	822	255.9	43.6	31.7	0.000000	0.810	0.410000	1.000000	0.000
48	748.0	515.0	824	252.6	44.1	31.6	0.000000	0.840	0.840000	1.000000	0.000
49	563.0	515.0	843	104.7	19.0	12.4	0.000000	0.670	0.670000	1.000000	0.000
50	667.0	515.0	846	100.9	18.6	12.2	0.000000	0.750	0.670000	1.000000	0.000
51	751.0	515.0	844	103.1	18.4	12.3	0.000000	0.770	0.770000	1.000000	0.000
52	653.0	515.0	891	62.7	9.2	6.0	0.000000	0.440	0.440000	1.000000	0.000
53	653.0	515.0	894	35.7	13.9	8.5	0.000000	0.380	0.380000	1.000000	0.000
54	750.0	515.0	896	37.3	13.6	8.3	0.000000	0.420	0.420000	1.000000	0.000
55	653.0	50.0	915	35.9	5.2	3.2	0.000000	0.300	0.300000	1.000000	0.000
56	747.0	65.0	918	22.4	5.3	3.3	0.000000	0.340	0.340000	1.000000	0.000
57	747.0	65.0	920	22.0	7.6	5.0	0.000000	0.270	0.270000	1.000000	0.000
58	554.0	1015.0	1036	350.0	126.0	70.1	0.000000	0.620	0.820000	1.000000	0.000
59	554.0	1015.0	1040	506.0	91.3	54.9	0.000000	0.840	0.840000	1.000000	0.000
60	654.0	1015.0	1050	567.7	85.3	46.1	0.000000	1.000	1.000000	1.000000	0.000
61	750.0	1015.0	1074	500.7	84.8	49.3	0.000000	1.010	1.010000	1.000000	0.000
62	663.0	1015.0	1083	336.1	127.4	71.5	0.000000	0.830	0.830000	1.000000	0.000
63	663.0	1015.0	1086	343.0	127.8	68.4	0.000000	0.940	0.940000	1.000000	0.000
64	753.0	1015.0	1098	344.5	127.5	70.5	0.000000	0.940	0.940000	1.000000	0.000
65	656.0	1015.0	1156	495.0	48.1	56.4	0.000000	0.970	0.970000	1.000000	0.000
66	753.0	1015.0	1160	477.5	97.9	56.0	0.000000	0.980	0.980000	1.000000	0.000
67	554.0	1015.0	1204	350.3	126.6	70.3	0.001300	0.620	0.456700	0.947141	3.720
68	655.0	1015.0	1206	343.5	128.7	69.5	0.001300	0.920	0.956800	0.941538	3.120
69	751.0	1015.0	1208	353.5	127.9	61.5	0.001103	0.930	0.964000	0.944730	3.030
70	557.0	1015.0	1227	497.5	98.9	53.4	0.001005	0.850	0.848800	0.945446	3.710
71	653.0	1015.0	1230	444.2	94.9	54.6	0.001005	0.960	0.999200	0.946769	3.330
72	749.0	1015.0	1232	448.0	99.5	53.7	0.001005	0.980	1.016500	0.944092	2.760
73	561.0	1015.0	1251	571.4	84.9	45.0	0.000794	0.880	0.920900	0.955587	3.310
74	654.0	1015.0	1254	571.9	84.3	47.0	0.000897	1.000	1.041600	0.940061	3.070
75	750.0	1015.0	1256	571.5	84.4	46.7	0.000897	1.010	1.044300	0.943465	2.730
76	554.0	515.0	1336	268.0	40.8	27.4	0.001010	0.780	0.824800	0.945684	3.670
77	654.0	515.0	1339	269.9	42.3	24.6	0.000897	0.860	0.904200	0.951117	3.300
78	747.0	515.0	1341	287.9	40.8	23.3	0.000893	0.890	0.931700	0.955243	3.020
79	556.0	215.0	1563	121.9	13.0	9.7	0.000884	0.770	0.815000	0.944785	3.520
80	653.0	215.0	1566	121.1	18.0	9.7	0.000884	0.850	0.894400	0.950358	2.970
81	750.0	215.0	1568	118.6	14.0	12.3	0.001116	0.880	0.921900	0.954550	2.700
82	556.0	115.0	1732	64.9	4.3	5.4	0.000870	0.390	0.415300	0.939080	3.600

D781133176

Table D-1, Part 3. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp, °F	P _T , psia	θ, hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r × 10 ⁴ , lb-mol/hr-g	r ₀ × 10 ⁴ , lb-mol/hr-g	a	-da/Δθ, a × 10 ⁵ , hr ⁻¹
83	553.0	115.0	1736	64.4	9.7	5.2	0.000783	0.000783	0.440	0.465000	0.945017	3.320
84	554.0	65.0	1756	30.0	7.5	3.0	0.000923	0.000923	0.280	0.294500	0.924023	4.650
85	554.0	65.0	1760	30.0	5.5	2.7	0.000764	0.000764	0.310	0.324300	0.944254	3.240
86	551.0	1015.0	1779	305.4	12.4	46.7	0.001544	0.001544	0.020	0.047200	0.924254	4.610
87	553.0	1015.0	1782	359.7	12.0	44.6	0.001544	0.001544	0.230	0.044100	0.921770	4.110
88	749.0	1015.0	1784	374.5	12.2	38.4	0.001349	0.001349	0.940	1.002700	0.927463	3.730
89	558.0	1015.0	1852	348.4	122.4	66.9	0.002294	0.002294	0.760	0.425000	0.921212	4.530
90	553.0	1015.0	1856	354.3	121.2	66.0	0.002294	0.002294	0.860	0.925700	0.925027	3.970
91	554.0	1015.0	1923	280.6	41.5	21.4	0.001495	0.001495	0.750	0.816700	0.919330	4.440
92	556.0	1015.0	1928	289.7	41.5	23.7	0.001592	0.001592	0.830	0.895900	0.926443	3.470
93	750.0	1015.0	1928	285.9	41.3	23.3	0.001592	0.001592	0.860	0.922100	0.927454	3.480
94	559.0	1015.0	2019	172.9	61.5	35.4	0.002291	0.002291	0.690	0.754700	0.914271	4.620
95	553.0	1015.0	2022	177.0	60.8	34.4	0.002291	0.002291	0.740	0.801400	0.922923	3.970
96	749.0	1015.0	2024	178.5	60.4	35.9	0.002409	0.002409	0.770	0.828500	0.929340	3.610
97	556.0	1015.0	2008	104.4	21.2	11.3	0.001814	0.001814	0.700	0.767200	0.912409	4.170
98	550.0	1015.0	2072	104.6	21.3	10.9	0.001814	0.001814	0.780	0.846800	0.921115	3.930
99	748.0	1015.0	2072	104.9	21.2	10.4	0.001814	0.001814	0.810	0.873700	0.927092	3.650
100	747.0	1015.0	2095	74.5	27.2	13.5	0.002274	0.002274	0.760	0.819400	0.926962	3.940
101	553.0	1015.0	2184	320.6	120.3	128.1	0.000000	0.000000	0.250	0.950000	1.000000	0.000
102	554.0	1015.0	2191	340.1	81.9	93.1	0.000000	0.000000	0.880	0.890000	1.000000	0.000
103	560.0	1015.0	2211	63.1	4.6	5.5	0.001474	0.001474	0.370	0.408100	0.906641	4.440
104	662.0	1015.0	2214	63.0	4.6	5.5	0.001474	0.001474	0.420	0.454500	0.914031	3.910
105	751.0	1015.0	2216	62.9	4.7	5.5	0.001474	0.001474	0.440	0.476700	0.923012	3.540
106	558.0	1015.0	2236	39.2	14.1	8.0	0.002261	0.002261	0.310	0.342300	0.905634	4.440
107	559.0	1015.0	2240	38.2	14.1	8.7	0.002435	0.002435	0.350	0.382500	0.915033	4.190
108	555.0	65.0	2260	35.8	5.5	3.1	0.001534	0.001534	0.250	0.276300	0.904814	3.820
109	557.0	65.0	2262	35.8	5.5	3.0	0.001534	0.001534	0.290	0.317200	0.914250	3.890
110	658.0	65.0	2264	22.7	4.1	4.4	0.002154	0.002154	0.230	0.251600	0.914144	3.970
111	554.0	1015.0	2355	562.3	95.0	46.0	0.003901	0.003901	0.210	1.033400	0.940544	5.760
112	653.0	1015.0	2358	561.6	95.2	46.3	0.003803	0.003803	1.000	1.120700	0.942299	5.120
113	752.0	1015.0	2360	560.4	95.4	46.0	0.003803	0.003803	1.010	1.120700	0.941222	4.650
114	552.0	1015.0	2379	358.1	137.6	68.9	0.005807	0.005807	0.620	0.932400	0.947451	5.400
115	652.0	1015.0	2382	358.0	137.6	68.9	0.005807	0.005807	0.950	1.065900	0.941266	4.440
116	751.0	1015.0	2384	358.0	137.6	68.9	0.005807	0.005807	0.960	1.066400	0.940225	4.600
117	554.0	1015.0	2404	501.9	107.5	52.9	0.004502	0.004502	0.860	0.979200	0.940225	5.400
118	657.0	1015.0	2408	501.5	107.7	52.9	0.004502	0.004502	0.980	1.100900	0.890181	6.690
119	555.0	1015.0	2427	286.3	46.1	24.3	0.004074	0.004074	0.800	0.912000	0.877193	5.330
120	652.0	1015.0	2430	286.5	46.0	24.2	0.004074	0.004074	0.210	1.023400	0.849193	5.050
121	750.0	1015.0	2432	286.6	46.0	24.3	0.004074	0.004074	0.250	1.057500	0.849345	4.350

D78113317c

Table D-1, Part 4. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp, °F	P _T , psia	Q, hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r x 10 ⁴ , lb-mol/hr-g	r _o x 10 ⁴ , lb-mol/hr-g	a	-Δa/Δθ, a x 10 ⁵ , hr ⁻¹
122	551.0	515.0	2452	250.2	53.4	28.5	2.420	0.004699	0.790	0.901800	0.874026	5.330
123	553.0	515.0	2456	250.6	53.2	28.5	2.420	0.004699	0.850	0.957100	0.888099	4.730
124	553.0	515.0	2859	180.0	68.2	33.0	2.880	0.005592	0.740	0.863500	0.856977	5.460
125	554.0	515.0	2862	180.7	68.0	33.0	2.880	0.005592	0.820	0.941600	0.870858	4.890
126	552.0	515.0	2864	180.5	68.1	33.0	2.880	0.005592	0.840	0.953000	0.881427	4.300
127	550.0	215.0	2883	119.7	19.3	10.3	0.860	0.004000	0.760	0.888000	0.855856	5.450
128	553.0	215.0	2886	119.5	19.4	10.3	0.860	0.004000	0.850	0.977200	0.869832	4.910
129	550.0	215.0	2888	119.8	19.3	10.3	0.860	0.004000	0.860	0.976800	0.880426	4.730
130	557.0	215.0	2932	107.0	21.9	11.5	0.950	0.004419	0.710	0.831800	0.853571	5.460
131	552.0	215.0	2936	106.8	22.0	11.5	0.950	0.004419	0.810	0.933400	0.867795	4.690
132	554.0	215.0	3028	73.0	28.6	13.9	1.230	0.005721	0.690	0.812500	0.849231	5.330
133	553.0	215.0	3032	75.0	28.5	14.0	1.230	0.005721	0.740	0.856800	0.863679	4.960
134	551.0	115.0	3075	64.1	10.3	5.1	0.450	0.003913	0.390	0.460400	0.847089	5.380
135	555.0	115.0	3078	64.3	10.2	5.0	0.450	0.003913	0.440	0.510600	0.861731	4.910
136	551.0	115.0	3080	64.2	10.3	5.1	0.450	0.003913	0.480	0.549800	0.873045	4.390
137	553.0	115.0	3100	40.6	15.0	7.6	0.660	0.005739	0.340	0.401900	0.845982	5.240
138	554.0	115.0	3104	40.5	14.9	7.6	0.660	0.005739	0.380	0.441500	0.860702	4.610
139	552.0	65.0	3196	35.7	8.0	2.9	0.260	0.004000	0.280	0.332700	0.841599	5.430
140	556.0	65.0	3200	35.5	5.9	2.9	0.260	0.004000	0.320	0.373500	0.856760	4.800
141	550.0	65.0	3202	35.5	5.9	2.9	0.260	0.004000	0.350	0.403100	0.868271	4.460
142	553.0	65.0	3292	22.7	8.6	4.5	0.380	0.005845	0.230	0.274700	0.837277	5.380
143	553.0	65.0	3296	22.7	8.4	4.4	0.380	0.005845	0.250	0.293200	0.852660	5.000

D78113317d

Table D-2, Part 1. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P _r , psia	Q, hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r x 10 ⁴ , lb-mol/hr-g	r ₀ x 10 ⁴ , lb-mol/hr-g	a	-Da/Δt a x 10 ⁵ hr -1
1	554.0	1015.0	4	500.0	93.2	0.0	0.000	0.000000	0.880000	0.880000	1.000000	0.000
2	564.0	1015.0	6	501.0	92.6	0.0	0.000	0.000000	0.980	0.980000	1.000000	0.000
3	573.0	1015.0	8	507.0	92.1	0.0	0.000	0.000000	1.010	1.010000	1.000000	0.000
4	577.0	1015.0	10	376.1	139.3	0.0	0.000	0.000000	0.850	0.850000	1.000000	0.000
5	584.0	1015.0	103	381.1	138.2	0.0	0.000	0.000000	0.960	0.960000	1.000000	0.000
6	582.0	1015.0	105	381.1	138.4	0.0	0.000	0.000000	0.970	0.970000	1.000000	0.000
7	584.0	1015.0	124	521.4	107.4	0.0	0.000	0.000000	0.870	0.870000	1.000000	0.000
8	584.0	1015.0	128	520.8	107.7	0.0	0.000	0.000000	0.870	0.870000	1.000000	0.000
9	582.0	1015.0	140	297.1	46.3	0.0	0.000	0.000000	0.770	0.770000	1.000000	0.000
10	580.0	1015.0	151	298.1	46.1	0.0	0.000	0.000000	0.860	0.860000	1.000000	0.000
11	582.0	1015.0	154	296.3	46.5	0.0	0.000	0.000000	0.860	0.860000	1.000000	0.000
12	581.0	1015.0	172	187.7	69.5	0.0	0.000	0.000000	0.680	0.680000	1.000000	0.000
13	584.0	1015.0	175	191.1	68.8	0.0	0.000	0.000000	0.780	0.780000	1.000000	0.000
14	583.0	1015.0	174	191.2	68.6	0.0	0.000	0.000000	0.800	0.800000	1.000000	0.000
15	582.0	1015.0	292	123.8	19.5	0.0	0.000	0.000000	0.630	0.630000	1.000000	0.000
16	588.0	1015.0	295	125.6	19.1	0.0	0.000	0.000000	0.660	0.660000	1.000000	0.000
17	584.0	1015.0	298	123.4	19.5	0.0	0.000	0.000000	0.690	0.690000	1.000000	0.000
18	580.0	1015.0	316	110.3	22.3	0.0	0.000	0.000000	0.620	0.620000	1.000000	0.000
19	587.0	1015.0	319	109.7	22.5	0.0	0.000	0.000000	0.650	0.650000	1.000000	0.000
20	585.0	1015.0	322	110.3	22.3	0.0	0.000	0.000000	0.690	0.690000	1.000000	0.000
21	583.0	1015.0	340	79.7	28.9	0.0	0.000	0.000000	0.570	0.570000	1.000000	0.000
22	583.0	1015.0	343	80.1	28.4	0.0	0.000	0.000000	0.600	0.600000	1.000000	0.000
23	582.0	1015.0	346	79.9	28.8	0.0	0.000	0.000000	0.640	0.640000	1.000000	0.000
24	582.0	1015.0	412	66.7	10.1	0.0	0.000	0.000000	0.380	0.380000	1.000000	0.000
25	582.0	1015.0	415	66.5	10.1	0.0	0.000	0.000000	0.420	0.420000	1.000000	0.000
26	581.0	1015.0	414	66.7	10.1	0.0	0.000	0.000000	0.470	0.470000	1.000000	0.000
27	584.0	1015.0	488	41.9	15.3	0.0	0.000	0.000000	0.300	0.300000	1.000000	0.000
28	583.0	1015.0	491	42.5	15.1	0.0	0.000	0.000000	0.370	0.370000	1.000000	0.000
29	585.0	1015.0	494	42.2	15.2	0.0	0.000	0.000000	0.420	0.420000	1.000000	0.000
30	581.0	65.0	514	37.5	5.7	0.0	0.000	0.000000	0.310	0.310000	1.000000	0.000
31	583.0	65.0	522	37.3	5.7	0.0	0.000	0.000000	0.370	0.370000	1.000000	0.000
32	583.0	65.0	525	37.5	5.7	0.0	0.000	0.000000	0.410	0.410000	1.000000	0.000
33	585.0	1015.0	651	494.2	45.4	54.8	0.000	0.000000	0.790	0.790000	1.000000	0.000
34	586.0	1015.0	654	556.2	83.9	48.3	0.000	0.000000	0.810	0.810000	1.000000	0.000
35	586.0	1015.0	656	560.5	83.0	48.4	0.000	0.000000	0.880	0.880000	1.000000	0.000
36	586.0	1015.0	675	321.5	121.7	59.7	0.000	0.000000	0.760	0.760000	1.000000	0.000
37	583.0	1015.0	678	321.5	121.7	59.7	0.000	0.000000	0.840	0.840000	1.000000	0.000
38	586.0	1015.0	680	374.0	116.2	58.8	0.000	0.000000	0.860	0.860000	1.000000	0.000
39	587.0	1015.0	699	250.2	48.8	27.7	0.000	0.000000	0.660	0.660000	1.000000	0.000
40	580.0	1015.0	702	282.1	42.9	24.0	0.000	0.000000	0.690	0.690000	1.000000	0.000
41	583.0	1015.0	704	284.3	42.4	24.1	0.000	0.000000	0.750	0.750000	1.000000	0.000

D78113318a

Table D-2, Part 2. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp., °F	P _T , psia	Q, hr	P _{H₂O} , psia	P _{CO} , psia	P, φ, psia	P _{OH} , psia	C _{OH} , mol frac.	r x 10 ⁴ , lb-mol/hr-g	r ₀ x 10 ⁴ , lb-mol/hr-g	a	-Δa/Δt, a x 10 ⁵ , hr ⁻¹
42	555.0	215.0	771	180.1	61.7	35.1	0.000	0.000000	0.610	0.610000	1.000000	0.000
43	555.0	215.0	774	182.9	62.2	34.4	0.000	0.000000	0.680	0.680000	1.000000	0.000
44	753.0	215.0	776	177.2	62.3	35.4	0.000	0.000000	0.710	0.710000	1.000000	0.000
45	559.0	215.0	795	119.1	17.4	10.0	0.000	0.000000	0.540	0.540000	1.000000	0.000
46	554.0	215.0	798	118.9	17.5	10.0	0.000	0.000000	0.560	0.560000	1.000000	0.000
47	753.0	215.0	800	118.8	17.5	9.9	0.000	0.000000	0.590	0.590000	1.000000	0.000
48	554.0	215.0	839	105.0	20.0	11.5	0.000	0.000000	0.520	0.520000	1.000000	0.000
49	555.0	215.0	842	104.4	19.9	11.4	0.000	0.000000	0.540	0.540000	1.000000	0.000
50	754.0	215.0	844	105.6	19.9	11.5	0.000	0.000000	0.570	0.570000	1.000000	0.000
51	556.0	215.0	863	74.4	25.8	14.7	0.000	0.000000	0.470	0.470000	1.000000	0.000
52	553.0	215.0	866	73.2	25.9	14.6	0.000	0.000000	0.520	0.520000	1.000000	0.000
53	752.0	215.0	869	73.2	25.9	14.3	0.000	0.000000	0.550	0.550000	1.000000	0.000
54	561.0	115.0	887	55.9	10.5	6.3	0.000	0.000000	0.320	0.320000	1.000000	0.000
55	557.0	115.0	890	61.7	9.5	5.6	0.000	0.000000	0.340	0.340000	1.000000	0.000
56	553.0	115.0	892	61.9	9.5	5.5	0.000	0.000000	0.390	0.390000	1.000000	0.000
57	563.0	115.0	939	38.8	13.7	7.9	0.000	0.000000	0.270	0.270000	1.000000	0.000
58	558.0	115.0	962	39.2	13.4	7.8	0.000	0.000000	0.330	0.330000	1.000000	0.000
59	753.0	115.0	964	39.9	13.4	7.8	0.000	0.000000	0.380	0.380000	1.000000	0.000
60	561.0	85.0	983	35.1	5.2	3.0	0.000	0.000000	0.290	0.290000	1.000000	0.000
61	557.0	85.0	986	35.8	5.2	3.1	0.000	0.000000	0.340	0.340000	1.000000	0.000
62	752.0	85.0	988	35.7	5.2	3.0	0.000	0.000000	0.360	0.360000	1.000000	0.000
63	562.0	85.0	1007	23.1	7.4	4.4	0.000	0.000000	0.260	0.260000	1.000000	0.000
64	555.0	85.0	1010	22.4	7.5	4.5	0.000	0.000000	0.300	0.300000	1.000000	0.000
65	752.0	85.0	1012	22.6	7.5	4.4	0.000	0.000000	0.320	0.320000	1.000000	0.000
66	558.0	85.0	1031	33.3	6.3	0.0	0.000	0.000000	0.290	0.290000	1.000000	0.000
67	558.0	85.0	1034	33.3	6.3	0.0	0.000	0.000000	0.320	0.320000	1.000000	0.000
68	753.0	85.0	1036	33.3	6.3	0.0	0.000	0.000000	0.360	0.360000	1.000000	0.000
69	553.0	85.0	1039	24.8	8.0	0.0	0.000	0.000000	0.260	0.260000	1.000000	0.000
70	554.0	85.0	1041	25.5	8.0	0.0	0.000	0.000000	0.310	0.310000	1.000000	0.000
71	753.0	85.0	1060	24.1	8.1	0.0	0.000	0.000000	0.340	0.340000	1.000000	0.000
72	561.0	215.0	1063	193.0	38.9	0.0	0.000	0.000000	0.350	0.350000	1.000000	0.000
73	557.0	215.0	1065	192.4	38.6	0.0	0.000	0.000000	0.400	0.400000	1.000000	0.000
74	758.0	215.0	1159	192.9	38.9	0.0	0.000	0.000000	0.420	0.420000	1.000000	0.000
75	559.0	215.0	1247	124.7	10.1	0.0	0.000	0.000000	0.320	0.320000	1.000000	0.000
76	558.0	215.0	1161	122.6	10.3	0.0	0.000	0.000000	0.340	0.340000	1.000000	0.000
77	757.0	215.0	1180	123.9	10.2	0.0	0.000	0.000000	0.360	0.360000	1.000000	0.000
78	555.0	215.0	1183	119.8	11.7	0.0	0.000	0.000000	0.320	0.320000	1.000000	0.000
79	554.0	215.0	1185	119.9	11.6	0.0	0.000	0.000000	0.340	0.340000	1.000000	0.000
80	756.0	215.0	1204	119.8	11.6	0.0	0.000	0.000000	0.360	0.360000	1.000000	0.000
81	555.0	215.0	1292	177.1	34.2	35.0	0.000	0.000000	0.330	0.330000	1.000000	0.000
82	554.0	215.0	1295	181.3	33.8	34.5	0.000	0.000000	0.340	0.360000	1.000000	0.000

D78113318b



I N S T I T U T E O F C H E M I S T R Y

Table D-2, Part 3. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P, psia	t, hr	P _{H₂O} , psia	P _{CO} , psia	P, φ, psia	P _{OH} , psia	C _{OH} , mol frac.	r x 10 ⁴ , lb-mol/hr-g	r ₀ x 10 ⁴ , lb-mol/hr-g	a	-Δa/Δθ, a x 10 ⁵ , hr ⁻¹
83	753.0	515.0	1297	176.5	34.2	35.4	0.000000	0.000000	0.390000	0.390000	1.000000	0.000
84	756.0	515.0	1323	118.4	9.6	10.0	0.000000	0.000000	0.280	0.280000	1.000000	0.000
85	755.0	515.0	1326	118.6	9.5	10.1	0.000000	0.000000	0.310	0.310000	1.000000	0.000
86	754.0	515.0	1329	118.5	9.5	10.1	0.000000	0.000000	0.370	0.370000	1.000000	0.000
87	755.0	515.0	1348	99.0	11.4	12.1	0.000000	0.000000	0.270	0.270000	1.000000	0.000
88	754.0	515.0	1351	104.1	11.0	11.6	0.000000	0.000000	0.300	0.300000	1.000000	0.000
89	753.0	515.0	1353	103.0	10.9	11.5	0.000000	0.000000	0.310	0.310000	1.000000	0.000
90	754.0	515.0	1372	40.1	7.5	7.9	0.000000	0.000000	0.140	0.140000	1.000000	0.000
91	753.0	515.0	1375	40.1	7.5	7.9	0.000000	0.000000	0.180	0.180000	1.000000	0.000
92	753.0	515.0	1377	40.2	7.5	7.8	0.000000	0.000000	0.220	0.220000	1.000000	0.000
93	750.0	515.0	1396	35.6	3.0	3.0	0.000000	0.000000	0.150	0.150000	1.000000	0.000
94	756.0	515.0	1399	35.7	2.9	3.0	0.000000	0.000000	0.190	0.190000	1.000000	0.000
95	754.0	515.0	1402	35.8	2.9	3.1	0.000000	0.000000	0.210	0.210000	1.000000	0.000
96	755.0	515.0	1407	285.2	41.4	23.8	0.000409	0.000409	0.650	0.686000	0.947522	3.780
97	754.0	515.0	1470	282.0	41.9	24.1	0.000409	0.000409	0.730	0.767100	0.951636	3.470
98	753.0	515.0	1472	283.7	41.7	23.9	0.000409	0.000409	0.760	0.795000	0.955975	3.130
99	753.0	515.0	1492	118.0	17.0	10.2	0.000419	0.000419	0.510	0.538800	0.946544	4.090
100	753.0	515.0	1495	118.1	17.0	10.0	0.000419	0.000419	0.560	0.557400	0.950443	3.350
101	752.0	515.0	1497	117.3	17.1	10.4	0.000419	0.000419	0.560	0.586200	0.955305	3.150
102	757.0	515.0	1515	75.1	24.6	14.6	0.000605	0.000605	0.440	0.465200	0.945830	3.180
103	756.0	515.0	1519	75.0	24.6	14.6	0.000605	0.000605	0.480	0.505200	0.950119	3.190
104	753.0	515.0	1521	74.9	24.6	14.8	0.000605	0.000605	0.510	0.534500	0.954163	4.980
105	757.0	515.0	1540	39.5	13.4	7.7	0.000609	0.000609	0.270	0.285700	0.945047	3.450
106	752.0	515.0	1543	40.1	13.3	7.7	0.000609	0.000609	0.350	0.358700	0.949281	3.660
107	751.0	515.0	1545	40.0	13.4	7.8	0.000609	0.000609	0.390	0.409000	0.953445	2.700
108	753.0	515.0	1545	35.5	23.7	3.0	0.000620	0.000620	1.250	1.311700	0.952962	3.200
109	753.0	515.0	1569	279.0	190.0	24.3	0.000409	0.000409	1.510	1.584800	0.952802	3.250
110	757.0	515.0	1630	348.0	83.0	46.6	0.001596	0.001596	0.760	0.818000	0.972095	4.230
111	758.0	515.0	1639	347.2	83.4	46.7	0.001594	0.001594	0.810	0.866000	0.975335	3.950
112	753.0	515.0	1642	349.9	83.1	45.7	0.001594	0.001594	0.830	0.881900	0.941150	3.810
113	754.0	515.0	1660	281.7	41.7	23.2	0.001573	0.001573	0.620	0.668100	0.928005	4.890
114	755.0	515.0	1663	280.0	42.0	23.1	0.001592	0.001592	0.690	0.738400	0.934453	3.940
115	754.0	515.0	1665	280.2	41.9	23.7	0.001592	0.001592	0.730	0.776300	0.940358	3.670
116	754.0	515.0	1684	118.0	17.5	9.8	0.001674	0.001674	0.480	0.517800	0.926999	4.540
117	757.0	515.0	1687	115.4	17.5	10.0	0.001674	0.001674	0.490	0.524800	0.933649	3.410
118	753.0	515.0	1689	115.7	17.5	9.7	0.001674	0.001674	0.520	0.553500	0.939476	3.920
119	759.0	515.0	1708	62.0	9.5	4.7	0.001565	0.001565	0.310	0.334700	0.926203	3.590
120	759.0	515.0	1711	61.6	9.5	5.3	0.001739	0.001739	0.350	0.375200	0.932836	3.640
121	753.0	515.0	1713	61.9	9.4	5.4	0.001739	0.001739	0.370	0.394100	0.938848	2.800
122	757.0	515.0	1733	35.2	5.3	2.9	0.001538	0.001538	0.280	0.302700	0.925004	5.140
123	756.0	515.0	1737	34.6	5.4	2.9	0.001538	0.001538	0.320	0.343400	0.931858	4.040

D78113318c

Table D-2, Part 4. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P _T , psia	t ₁ , hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r x 10 ⁴ , lb-mol/hr-g	r ₀ x 10 ⁴ , lb-mol/hr-g	a	-Δa/Δθ, a x 10 ⁵ , hr ⁻¹
124	554.0	1015.0	2208	539.1	80.1	44.7	4.360	0.004295	0.730	0.824000	0.885922	5.840
125	555.0	1015.0	2211	540.8	85.7	45.1	4.360	0.004295	0.760	0.844000	0.896226	5.270
126	553.0	1015.0	2213	542.0	85.6	44.5	4.360	0.004295	0.800	0.883900	0.905080	4.740
127	557.0	215.0	2400	114.3	18.3	9.4	0.920	0.004279	0.470	0.536300	0.876375	5.670
128	554.0	215.0	2403	114.2	18.3	9.5	0.920	0.004279	0.480	0.540700	0.887738	4.990
129	553.0	215.0	2405	114.5	18.3	9.4	0.920	0.004279	0.510	0.564500	0.897098	4.640
130	558.0	115.0	2432	61.0	9.8	5.0	0.490	0.004261	0.290	0.331500	0.874811	5.590
131	554.0	115.0	2435	61.0	9.6	5.7	0.490	0.004261	0.340	0.383600	0.886340	4.930
132	552.0	115.0	2437	61.3	9.7	5.0	0.490	0.004261	0.360	0.401900	0.895745	4.720
133	551.0	315.0	4	204.8	53.2	0.0	0.000	0.000000	0.950	0.950000	1.000000	0.000
134	551.0	315.0	10	248.2	51.7	27.8	0.000	0.000000	0.860	0.860000	1.000000	0.000
135	550.0	315.0	34	250.1	50.9	27.0	2.630	0.005107	0.840	0.841000	0.998811	3.530
136	551.0	315.0	58	249.5	50.9	27.4	2.630	0.005107	0.840	0.842100	0.997506	5.440
137	550.0	315.0	82	252.3	50.3	27.1	2.610	0.005068	0.830	0.833100	0.996279	5.130
138	551.0	315.0	130	252.8	50.2	27.1	2.610	0.005068	0.820	0.825200	0.993694	5.380
139	551.0	315.0	154	250.4	50.7	27.8	2.680	0.005204	0.800	0.806000	0.992556	4.780
140	551.0	315.0	178	252.5	50.8	24.8	2.680	0.005204	0.790	0.797000	0.991217	5.570
141	550.0	315.0	202	248.0	50.8	27.3	2.680	0.005204	0.790	0.797900	0.990099	5.680
142	550.0	315.0	250	249.0	51.6	24.9	2.680	0.005204	0.780	0.789900	0.987467	2.080
143	551.0	315.0	274	249.7	51.3	25.2	2.680	0.005204	0.770	0.780700	0.986294	4.960
144	550.0	315.0	298	244.0	51.5	25.2	2.680	0.005204	0.770	0.781700	0.985033	5.370
145	551.0	315.0	320	249.2	51.4	24.8	2.680	0.005204	0.760	0.772600	0.983691	6.180

D78113318D

Table D-3, Part 1. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(G-93 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp. °F	P, psia	θ, hr	P _{H₂O} , psia	PCO, psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r x 10 ⁴ lb-mol hr-g	r x 10 ⁴ lb-mol hr-g	a	-Δa/Δθ (a x 10 ⁵), hr ⁻¹
1	525.0	485.0	8	525.0	50.2	0.0	0.000	0.000000	0.420	0.420000	1.000000	0.000
2	525.0	485.0	32	500.0	94.1	0.0	0.000	0.000000	0.440	0.440000	1.000000	0.000
3	525.0	485.0	128	392.0	117.4	0.0	0.000	0.000000	0.580	0.580000	1.000000	0.000
4	575.0	1000.0	131	476.4	99.5	0.0	0.000	0.000000	0.580	0.580000	1.000000	0.000
5	610.0	1005.0	155	418.4	115.8	0.0	0.000	0.000000	0.970	0.970000	1.000000	0.000
6	655.0	995.0	158	508.0	96.0	0.0	0.000	0.000000	0.970	0.970000	1.000000	0.000
7	658.0	995.0	182	522.0	93.1	0.0	0.000	0.000000	1.060	1.060000	1.000000	0.000
8	660.0	1000.0	185	539.4	85.7	0.0	0.000	0.000000	1.060	1.060000	1.000000	0.000
9	660.0	915.0	209	182.8	71.5	0.0	0.000	0.000000	0.920	0.920000	1.000000	0.000
10	660.0	915.0	257	253.8	55.5	0.0	0.000	0.000000	1.030	1.030000	1.000000	0.000
11	665.0	215.0	305	101.7	20.0	0.0	0.000	0.000000	0.630	0.630000	1.000000	0.000
12	660.0	1015.0	329	479.8	104.0	0.0	0.000	0.000000	1.040	1.040000	1.000000	0.000
13	660.0	1015.0	353	335.8	132.0	60.0	0.000	0.000000	0.990	0.990000	1.000000	0.000
14	660.0	1015.0	377	490.3	98.0	50.0	0.000	0.000000	1.010	1.010000	1.000000	0.000
15	665.0	1010.0	452	531.7	102.3	44.8	0.000	0.000000	1.190	1.190000	1.000000	0.000
16	663.0	518.0	478	241.7	61.4	24.7	0.000	0.000000	1.010	1.010000	1.000000	0.000
17	663.0	517.0	478	173.7	77.8	28.0	0.000	0.000000	1.000	1.000000	1.000000	0.000
18	665.0	517.0	502	218.7	53.2	49.5	0.000	0.000000	0.610	0.610000	1.000000	0.000
19	665.0	525.0	526	153.9	69.9	63.8	0.000	0.000000	0.600	0.600000	1.000000	0.000
20	662.0	270.0	550	84.1	36.0	21.8	0.000	0.000000	0.490	0.490000	1.000000	0.000
21	664.0	270.0	622	126.0	26.3	18.0	0.000	0.000000	0.580	0.580000	1.000000	0.000
22	665.0	205.0	646	122.2	27.3	12.0	0.000	0.000000	0.680	0.680000	1.000000	0.000
23	664.0	270.0	670	88.5	39.8	15.6	0.000	0.000000	0.880	0.880000	1.000000	0.000
24	665.0	1015.0	838	585.0	80.4	56.0	0.000	0.000000	0.600	0.600000	1.000000	0.000
25	665.0	1015.0	862	519.4	94.0	65.0	0.000	0.000000	0.630	0.630000	1.000000	0.000
26	665.0	1015.0	886	382.1	148.0	58.6	0.000	0.000000	1.230	1.230000	1.000000	0.000
27	665.0	1015.0	958	493.6	104.0	51.0	0.000	0.000000	1.030	1.030000	1.000000	0.000
28	668.0	1015.0	8	507.3	77.0	44.0	0.000	0.000000	0.970	0.970000	1.000000	0.000
29	665.0	1015.0	32	502.0	91.0	51.0	0.000	0.000000	0.940	0.940000	1.000000	0.000
30	664.0	1015.0	56	476.0	88.0	55.0	0.000	0.000000	0.880	0.881600	0.99815	3.180
31	668.0	1015.0	176	474.0	93.0	49.0	0.400	0.000394	0.890	0.895000	0.944413	3.190
32	669.0	1015.0	178	371.5	117.0	51.5	0.500	0.000493	0.860	0.865100	0.994105	3.320
33	669.0	1015.0	302	374.0	102.0	108.0	0.600	0.000788	0.860	0.869400	0.989188	3.620
34	669.0	1015.0	325	530.0	72.0	59.0	0.500	0.000493	0.920	0.930000	0.959247	3.320
35	664.0	515.0	24	239.0	53.5	0.0	0.000	0.000000	0.850	0.850000	1.000000	0.000
36	664.0	515.0	44	202.0	49.3	0.0	0.000	0.000000	0.870	0.970000	1.000000	0.000
37	652.0	515.0	72	184.0	66.0	37.0	0.000	0.000000	0.820	0.820000	1.000000	0.000
38	668.0	515.0	46	178.0	64.0	35.0	0.000	0.000000	0.850	0.850000	1.000000	0.000
39	656.0	215.0	120	103.0	24.0	11.0	0.000	0.000000	0.840	0.840000	1.000000	0.000
40	656.0	265.0	216	141.0	24.5	13.0	0.000	0.000000	0.620	0.620000	1.000000	0.000
41	656.0	515.0	264	279.0	41.0	26.0	0.000	0.000000	0.600	0.600000	1.000000	0.000
42	656.0	515.0	266	248.0	47.0	29.0	0.000	0.000000	0.580	0.580000	1.000000	0.000
43	659.0	1015.0	302	342.0	83.0	32.0	0.000	0.000000	0.970	0.970000	1.000000	0.000
44	664.0	1015.0	366	392.0	117.0	6.0	0.000	0.000000	0.920	0.920000	1.000000	0.000
45	539.0	1015.0	414	534.0	47.0	0.0	0.000	0.000000	1.110	1.110000	1.000000	0.000

D78113319a

Table D-3, Part 2. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(G-93 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp. °F	P _T psia	θ, hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r x 10 ⁴ , lb-mol/hr-g	r ₀ x 10 ⁴ , lb-mol/hr-g	a	-Δa/Δθ, (a x 10 ⁵), hr ⁻¹
46	540.0	1015.0	458	528.0	74.0	89.0	0.000	0.000000	0.720	0.720000	1.000000	0.000
47	540.0	1015.0	530	560.0	67.0	91.0	0.000	0.000000	0.740	0.720000	1.000000	0.000
48	550.0	1015.0	554	465.0	85.0	122.0	0.000	0.000000	0.860	0.860000	1.000000	0.000
49	662.0	515.0	602	247.0	58.0	0.0	0.000	0.000000	0.580	0.580000	1.000000	0.000
50	661.0	265.0	650	114.0	32.0	0.0	0.000	0.000000	0.700	0.700000	1.000000	0.000
51	661.0	265.0	655	141.0	26.0	0.0	0.000	0.000000	0.700	0.700000	1.000000	0.000
52	661.0	265.0	658	151.0	24.0	0.0	0.000	0.000000	0.610	0.610000	1.000000	0.000
53	556.0	1015.0	722	528.0	71.0	88.0	0.000	0.000000	0.700	0.700000	1.000000	0.000
54	539.0	1015.0	914	568.0	72.0	89.0	0.000	0.000000	0.730	0.730000	1.000000	0.000
55	535.0	1015.0	938	583.0	75.0	93.0	0.000	0.000000	0.660	0.660000	1.000000	0.000
56	667.0	1015.0	962	563.0	76.0	88.0	0.000	0.000000	0.890	0.890000	1.000000	0.000
57	757.0	1015.0	1082	562.0	65.0	71.0	0.000	0.000000	0.680	0.680000	1.000000	0.000
58	742.0	1015.0	1106	565.0	63.0	91.0	0.000	0.000000	0.660	0.660000	1.000000	0.000
59	546.0	1015.0	1228	485.0	104.0	0.0	0.000	0.000000	0.820	0.820000	1.000000	0.000
60	547.0	1015.0	1250	507.0	99.0	0.0	0.000	0.000000	0.840	0.840000	1.000000	0.000
61	547.0	1015.0	1274	501.0	92.0	41.0	0.000	0.000000	0.840	0.840000	1.000000	0.000
62	542.0	515.0	1278	280.0	46.0	0.0	0.000	0.000000	0.840	0.840000	1.000000	0.000
63	542.0	515.0	1282	166.0	70.0	0.0	0.000	0.000000	0.770	0.770000	1.000000	0.000
64	653.0	515.0	1306	166.0	70.0	0.0	0.000	0.000000	0.880	0.880000	1.000000	0.000
65	653.0	515.0	1312	231.0	52.0	0.0	0.000	0.000000	0.900	0.900000	1.000000	0.000
66	750.0	515.0	1360	280.0	46.0	0.0	0.000	0.000000	0.960	0.960000	1.000000	0.000
67	750.0	515.0	1362	171.0	69.0	0.0	0.000	0.000000	0.850	0.850000	1.000000	0.000
68	746.0	515.0	1364	165.0	64.0	31.0	0.000	0.000000	0.810	0.810000	1.000000	0.000
69	746.0	515.0	1366	248.0	48.0	24.0	0.000	0.000000	0.860	0.860000	1.000000	0.000
70	746.0	515.0	1370	281.0	42.0	21.0	0.000	0.000000	0.910	0.910000	1.000000	0.000
71	746.0	515.0	1436	282.0	40.0	21.0	0.150	0.000291	0.840	0.876500	0.958248	3.030
72	746.0	515.0	1438	248.0	47.0	24.0	0.220	0.000388	0.840	0.876700	0.958138	5.640
73	746.0	515.0	1442	162.0	63.0	33.0	0.220	0.000427	0.800	0.835000	0.958084	1.430
74	561.0	515.0	1512	278.0	41.0	23.0	0.150	0.000291	0.740	0.781300	0.947134	3.640
75	656.0	515.0	1515	167.0	61.0	34.0	0.250	0.000485	0.680	0.718100	0.946943	3.520
76	656.0	515.0	1535	274.0	41.0	22.0	0.150	0.000291	0.840	0.883400	0.950872	3.360
77	656.0	515.0	1539	157.0	65.0	35.0	0.250	0.000485	0.810	0.852000	0.950704	4.420
78	558.0	215.0	1609	118.0	15.4	7.5	0.060	0.000279	0.660	0.699300	0.947101	3.540
79	558.0	215.0	1612	101.0	18.8	7.9	0.060	0.000279	0.650	0.688800	0.947370	4.620
80	558.0	215.0	1615	80.0	25.2	19.0	0.140	0.000651	0.610	0.646500	0.947542	4.510
81	656.0	215.0	1629	67.0	26.0	19.0	0.080	0.000372	0.640	0.675100	0.948008	3.210
82	656.0	215.0	1632	100.0	19.0	10.0	0.060	0.000279	0.680	0.717400	0.947867	3.200
83	556.0	215.0	1635	112.0	16.0	16.0	0.080	0.000372	0.730	0.770200	0.947606	3.220
84	746.0	215.0	1655	112.0	17.0	8.0	0.060	0.000279	0.760	0.797400	0.953094	2.460
85	746.0	215.0	1659	67.0	25.0	13.0	0.100	0.000465	0.720	0.755500	0.953011	2.270
86	745.0	215.0	1779	111.0	17.0	9.0	0.080	0.000372	0.750	0.750000	1.000000	0.000
87	744.0	215.0	1782	73.0	24.0	14.0	0.080	0.000372	0.730	0.730000	1.000000	0.000
88	744.0	215.0	1785	65.0	24.0	0.0	0.080	0.000372	0.860	0.860000	1.000000	0.000
89	744.0	215.0	1790	100.0	20.0	0.0	0.080	0.000372	0.840	0.840000	1.000000	0.000
90	744.0	215.0	1814	114.0	18.0	6.0	0.080	0.000372	0.870	0.870000	1.000000	0.000

D78113319b

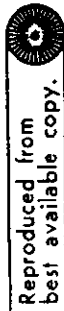


Table D-3, Part 3. EXPERIMENTAL DATA ON DEACTIVATION BY PHENOL
(G-93 Catalyst, 4 x 6 Mesh Spheres).

Run No.	Temp. °F	P, psia	t, hr	P _{H₂O} , psia	P _{CO} , psia	P _φ , psia	P _{φOH} , psia	C _{φOH} , mol frac.	r x 10 ⁴ lb-mol hr-g	r ₀ x 10 ⁴ lb-mol hr-g	a	$\frac{-\Delta a/\Delta t}{(a \times 10^5)}$, hr ⁻¹
91	745.0	215.0	1817	117.0	8.0	0.0	0.000	0.000000	0.420	0.420000	1.000000	0.000
92	745.0	215.0	1820	74.0	12.0	0.0	0.000	0.000000	0.370	0.370000	1.000000	0.000
93	746.0	215.0	1834	110.0	8.0	8.0	0.060	0.000279	0.370	0.390200	0.948232	2.880
94	746.0	215.0	1854	84.0	10.0	14.0	0.100	0.000465	0.360	0.379900	0.947618	3.240
95	661.0	215.0	1878	67.0	12.0	12.0	0.100	0.000465	0.320	0.340400	0.940071	3.380
96	661.0	215.0	1882	112.0	8.0	8.0	0.060	0.000279	0.350	0.372300	0.940102	3.140
97	560.0	215.0	1954	114.0	8.0	8.0	0.060	0.000279	0.310	0.332600	0.932051	3.640
98	560.0	215.0	1958	71.0	12.0	11.0	0.080	0.000372	0.300	0.321900	0.931966	2.250
99	538.0	215.0	1982	154.0	31.0	33.0	0.250	0.000485	0.350	0.375900	0.931099	3.870
100	338.0	215.0	1986	286.0	14.0	20.0	0.150	0.000291	0.360	0.386700	0.930954	3.870
101	660.0	215.0	2010	278.0	21.0	21.0	0.150	0.000291	0.400	0.427400	0.935891	3.510
102	660.0	215.0	2014	160.0	31.0	31.0	0.250	0.000485	0.380	0.406100	0.935730	4.310
103	745.0	215.0	2038	282.0	20.0	21.0	0.150	0.000291	0.410	0.434900	0.942745	2.810
104	745.0	215.0	2042	144.0	34.0	27.0	0.200	0.000388	0.400	0.424400	0.942507	6.320
105	744.0	215.0	2066	563.0	34.0	42.0	0.300	0.000296	0.410	0.435300	0.941879	2.780
106	744.0	215.0	2070	339.0	59.0	64.0	0.500	0.000493	0.380	0.403500	0.941760	3.180
107	658.0	215.0	2142	553.0	34.0	51.0	0.410	0.000404	0.390	0.418600	0.931677	3.400
108	658.0	215.0	2146	310.0	60.0	79.0	0.610	0.000601	0.380	0.407900	0.931601	2.050
109	557.0	215.0	2170	304.0	61.0	80.0	0.610	0.000601	0.400	0.432500	0.928855	3.600
110	557.0	215.0	2174	564.0	38.0	45.0	0.300	0.000294	0.410	0.443500	0.924464	4.410

D78113319c

Table D-4, Part 1. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS (UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp, °F	P _T , psia	C _{ΦOH} , mol frac.	a _e	a ₁	$\frac{a_e - a_1}{a_e}$	b	$\frac{a_e - a_2}{a_e}$	a ₃	$\frac{a_e - a_3}{a_e}$	d	$\frac{a_e - a_4}{a_e}$
1	561.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
2	665.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
3	755.0	1115.0	0.0000	1.6000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
4	554.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
5	657.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
6	752.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
7	561.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
8	656.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
9	753.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
10	551.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
11	652.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
12	749.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
13	566.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
14	663.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
15	750.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
16	663.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
17	659.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
18	753.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
19	554.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
20	662.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
21	760.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
22	663.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
23	744.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
24	565.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
25	663.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
26	755.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
27	753.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
28	662.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
29	567.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
30	665.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
31	653.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
32	760.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
33	659.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
34	762.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
35	548.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
36	657.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
37	551.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
38	651.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
39	754.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
40	552.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
41	655.0	1115.0	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000

D78113320a

Table D-4, Part 2. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS
(UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp, °F	P, psi	C _{OH} , mol frac.	a ₁	$\frac{a_e - a_1}{a_e}$	a ₂	$\frac{a_e - a_2}{a_e}$	a ₃	$\frac{a_e - a_3}{a_e}$	a ₄	$\frac{a_e - a_4}{a_e}$
42	752.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
43	563.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
44	551.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
45	747.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
46	563.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
47	654.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
48	748.0	515.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
49	563.0	215.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
50	662.0	215.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
51	751.0	215.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
52	653.0	115.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
53	653.0	115.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
54	750.0	115.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
55	653.0	65.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
56	747.0	65.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
57	747.0	65.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
58	554.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
59	552.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
60	654.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
61	750.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
62	560.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
63	663.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
64	753.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
65	656.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
66	753.0	1015.0	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
67	554.0	1015.0	0.0013	0.9483	0.0092	0.9496	0.0079	0.9494	0.0081	0.9497	0.0079
68	655.0	1015.0	0.0013	0.9534	0.0085	0.9546	0.0072	0.9545	0.0073	0.9548	0.0071
69	751.0	1015.0	0.0011	0.9583	0.0067	0.9594	0.0055	0.9594	0.0057	0.9594	0.0054
70	557.0	1015.0	0.0010	0.9499	0.0068	0.9512	0.0054	0.9509	0.0057	0.9512	0.0054
71	653.0	1015.0	0.0010	0.9545	0.0065	0.9557	0.0053	0.9556	0.0054	0.9558	0.0051
72	749.0	1015.0	0.0010	0.9581	0.0062	0.9592	0.0051	0.9592	0.0051	0.9594	0.0049
73	561.0	1015.0	0.0008	0.9512	0.0046	0.9525	0.0033	0.9522	0.0036	0.9525	0.0033
74	654.0	1015.0	0.0007	0.9546	0.0057	0.9558	0.0044	0.9557	0.0046	0.9559	0.0043
75	750.0	1015.0	0.0009	0.9582	0.0055	0.9593	0.0043	0.9593	0.0043	0.9595	0.0041
76	554.0	515.0	0.0010	0.9374	0.0088	0.9390	0.0071	0.9387	0.0074	0.9390	0.0070
77	654.0	515.0	0.0009	0.9448	0.0068	0.9461	0.0053	0.9459	0.0055	0.9462	0.0051
78	747.0	515.0	0.0009	0.9488	0.0067	0.9502	0.0052	0.9502	0.0053	0.9504	0.0050
79	556.0	215.0	0.0009	0.9379	0.0073	0.9395	0.0055	0.9392	0.0059	0.9394	0.0055
80	653.0	215.0	0.0007	0.9437	0.0070	0.9452	0.0054	0.9450	0.0056	0.9454	0.0053
81	750.0	215.0	0.0011	0.9460	0.0089	0.9475	0.0074	0.9474	0.0074	0.9477	0.0072
82	556.0	115.0	0.0009	0.9316	0.0079	0.9334	0.0060	0.9330	0.0065	0.9334	0.0060

D78113320b

Table D-4, Part 3. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS (UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp, °F	P _T , psia	a _e	C ₆ H ₆ , mol frac.	a ₁	$\frac{a_1 - a_e}{a_e}$	b	$\frac{a_2 - a_e}{a_e}$	a ₃	$\frac{a_3 - a_2}{a_e}$	a ₄	$\frac{a_4 - a_3}{a_e}$
83	653.0	115.0	0.9450	0.0008	0.9391	0.0062	0.9407	0.0045	0.9405	0.0045	0.9404	0.0044
84	554.0	65.0	0.9380	0.0009	0.9385	0.0087	0.9317	0.0068	0.9313	0.0072	0.9317	0.0067
85	654.0	65.0	0.9443	0.0008	0.9385	0.0061	0.9402	0.0043	0.9400	0.0045	0.9403	0.0042
86	551.0	1015.0	0.9243	0.0016	0.9216	0.0029	0.9235	0.0008	0.9232	0.0011	0.9237	0.0006
87	653.0	1015.0	0.9318	0.0014	0.9363	0.0013	0.9311	0.0009	0.9310	0.0009	0.9314	0.0004
88	749.0	1015.0	0.9375	0.0014	0.9363	0.0013	0.9380	-0.0005	0.9380	-0.0006	0.9383	-0.0009
89	558.0	1015.0	0.9212	0.0023	0.9139	0.0080	0.9160	0.0057	0.9157	0.0060	0.9163	0.0054
90	653.0	1015.0	0.9290	0.0023	0.9216	0.0080	0.9236	0.0059	0.9235	0.0059	0.9240	0.0054
91	554.0	515.0	0.9183	0.0015	0.9167	0.0017	0.9188	-0.0005	0.9185	-0.0001	0.9190	-0.0007
92	656.0	515.0	0.9264	0.0016	0.9240	0.0026	0.9259	0.0005	0.9258	0.0007	0.9263	0.0002
93	750.0	315.0	0.9327	0.0016	0.9298	0.0031	0.9316	0.0011	0.9317	0.0010	0.9320	0.0007
94	559.0	315.0	0.9143	0.0023	0.9066	0.0084	0.9089	0.0059	0.9086	0.0062	0.9092	0.0056
95	653.0	315.0	0.9229	0.0024	0.9149	0.0087	0.9171	0.0064	0.9170	0.0064	0.9175	0.0059
96	749.0	215.0	0.9124	0.0016	0.9079	0.0049	0.9229	0.0070	0.9230	0.0068	0.9234	0.0064
97	556.0	215.0	0.9211	0.0018	0.9169	0.0046	0.9190	0.0023	0.9098	0.0028	0.9104	0.0027
98	680.0	215.0	0.9271	0.0018	0.9222	0.0053	0.9190	0.0023	0.9189	0.0028	0.9194	0.0019
99	747.0	215.0	0.9269	0.0023	0.9186	0.0067	0.9209	0.0031	0.9243	0.0030	0.9247	0.0026
100	654.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
101	554.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
102	560.0	115.0	0.9066	0.0015	0.9057	0.0011	0.9080	-0.0015	0.9076	-0.0011	0.9082	-0.0018
103	662.0	115.0	0.9160	0.0014	0.9156	0.0005	0.9178	-0.0019	0.9176	-0.0018	0.9181	-0.0023
104	751.0	115.0	0.9230	0.0015	0.9208	0.0023	0.9229	0.0001	0.9230	0.0001	0.9237	-0.0004
105	558.0	115.0	0.9036	0.0023	0.8972	0.0063	0.8997	0.0066	0.8994	0.0069	0.9000	0.0062
106	559.0	115.0	0.9150	0.0024	0.9057	0.0102	0.9049	0.0075	0.9081	0.0076	0.9084	0.0070
107	555.0	65.0	0.9048	0.0015	0.9025	0.0026	0.9049	-0.0001	0.9045	0.0003	0.9051	-0.0003
108	657.0	65.0	0.9147	0.0015	0.9120	0.0025	0.9142	0.0001	0.9141	0.0002	0.9144	-0.0003
109	658.0	65.0	0.9141	0.0022	0.9067	0.0082	0.9090	0.0056	0.9090	0.0057	0.9095	0.0051
110	554.0	1015.0	0.8806	0.0039	0.8810	-0.0005	0.8837	-0.0036	0.8835	-0.0034	0.8843	-0.0043
111	553.0	1015.0	0.8923	0.0038	0.8926	-0.0003	0.8951	-0.0032	0.8952	-0.0033	0.8959	-0.0040
112	752.0	1015.0	0.9012	0.0038	0.9011	0.0001	0.9035	-0.0025	0.9038	-0.0029	0.9047	-0.0034
113	552.0	1015.0	0.8795	0.0058	0.8712	0.0094	0.8741	0.0061	0.8740	0.0062	0.8749	0.0052
114	652.0	1015.0	0.8913	0.0058	0.8833	0.0089	0.8860	0.0059	0.8862	0.0056	0.8869	0.0048
115	751.0	1015.0	0.9002	0.0058	0.8925	0.0085	0.8951	0.0057	0.8955	0.0052	0.8961	0.0046
116	554.0	1015.0	0.8783	0.0045	0.8757	0.0029	0.8785	-0.0003	0.8784	-0.0001	0.8792	-0.0011
117	657.0	1015.0	0.8902	0.0045	0.8876	0.0029	0.8903	-0.0001	0.8904	-0.0003	0.8911	-0.0010
118	555.0	515.0	0.8772	0.0041	0.8768	0.0004	0.8796	0.0029	0.8795	0.0026	0.8803	0.0035
119	652.0	515.0	0.8842	0.0041	0.8841	0.0013	0.8907	-0.0017	0.8904	-0.0018	0.8915	-0.0026
120	750.0	515.0	0.8943	0.0041	0.8968	0.0017	0.8993	-0.0011	0.8997	-0.0015	0.9002	-0.0021

078113320c

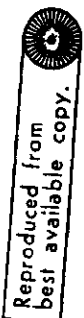


Table D-4, Part 4. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS (UC-1870-46-1 Catalyst, 1/16-in. Extrusions)

Run No.	Temp, °F	P _T , psia	a _e	C _{ΦOH} , mol % ^{1/2}	a ₁	$\frac{a_c - a_1}{a_e}$	b ₂	$\frac{a_e - a_2}{a_e}$	a ₃	$\frac{a_e - a_3}{a_e}$	a ₄	$\frac{a_e - a_4}{a_e}$
122	551.0	515.0	0.3750	0.0047	0.8720	0.0046	0.8749	0.0012	0.8744	0.0014	0.8756	0.0004
123	553.0	515.0	0.4001	0.0047	0.8843	0.0043	0.8870	0.0013	0.8871	0.0011	0.8874	0.0004
124	553.0	515.0	0.4570	0.0050	0.9004	0.0109	0.8519	0.0061	0.8517	0.0052	0.8527	0.0050
125	554.0	515.0	0.4709	0.0050	0.8960	0.0095	0.8070	0.0059	0.8060	0.0056	0.8064	0.0044
126	557.0	515.0	0.4814	0.0050	0.8732	0.0093	0.8762	0.0059	0.8761	0.0053	0.8774	0.0044
127	558.0	515.0	0.4939	0.0040	0.8851	0.0009	0.8584	-0.0030	0.8581	-0.0027	0.8591	-0.0034
128	573.0	515.0	0.4594	0.0040	0.8670	0.0069	0.8721	-0.0024	0.8722	-0.0024	0.8730	-0.0036
129	750.0	515.0	0.3804	0.0040	0.8791	0.0015	0.8820	-0.0014	0.8824	-0.0022	0.8830	-0.0030
130	757.0	515.0	0.3636	0.0044	0.8915	0.0024	0.8543	-0.0015	0.8546	-0.0013	0.8554	-0.0024
131	552.0	515.0	0.4678	0.0044	0.8665	0.0037	0.8677	0.0001	0.8679	-0.0001	0.8687	-0.0010
132	554.0	515.0	0.4632	0.0057	0.8398	0.0111	0.8433	0.0070	0.8432	0.0071	0.8444	0.0059
133	553.0	515.0	0.4637	0.0057	0.8544	0.0107	0.8577	0.0069	0.8580	0.0066	0.8588	0.0056
134	551.0	515.0	0.4671	0.0054	0.8470	0.0002	0.8504	-0.0034	0.8502	-0.0036	0.8512	-0.0044
135	554.0	515.0	0.4617	0.0054	0.8517	0.0000	0.8649	-0.0037	0.8651	-0.0039	0.8654	-0.0048
136	751.0	515.0	0.4730	0.0059	0.8727	0.0010	0.8753	-0.0025	0.8757	-0.0030	0.8763	-0.0037
137	553.0	515.0	0.4650	0.0057	0.8400	0.0117	0.8396	0.0075	0.8395	0.0076	0.8404	0.0064
138	554.0	515.0	0.4607	0.0057	0.8513	0.0110	0.8546	0.0071	0.8549	0.0067	0.8554	0.0057
139	552.0	515.0	0.4616	0.0040	0.8410	0.0007	0.8440	-0.0034	0.8444	-0.0033	0.8454	-0.0045
140	550.0	515.0	0.4508	0.0040	0.8456	0.0006	0.8590	-0.0033	0.8597	-0.0035	0.8606	-0.0044
141	750.0	515.0	0.4643	0.0040	0.8509	0.0016	0.8701	-0.0021	0.8705	-0.0025	0.8712	-0.0033
142	553.0	515.0	0.4713	0.0050	0.8263	0.0131	0.8301	0.0084	0.8300	0.0087	0.8311	0.0074
143	653.0	65.0	0.8527	0.0050	0.8432	0.0123	0.8458	0.0041	0.8461	0.0077	0.8470	0.0066

D78113320d

a₁ = exp (-4.50 x 10⁻⁵ ε 2386/RT C_{ΦOH} 0.1813 θ)

b₂ = exp (-4.44 x 10⁻⁵ ε 2399/RT C_{ΦOH} 0.1829 θ)

c₃ = exp (-4.20 x 10⁻⁵ ε 2464/RT C_{ΦOH} 0.1800 θ)

d₄ = exp (-4.23 x 10⁻⁵ ε 2445/RT C_{ΦOH} 0.1796 θ)

Table D-5, Part 1. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS (Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P _T , psia	a _e	C _{40H} , mol frac.	a ₁	$\frac{a_e - a_1}{a_e}$	b ₂	$\frac{a_e - a_2}{a_e}$	a ₃	$\frac{a_e - a_3}{a_e}$	a ₄	$\frac{a_e - a_4}{a_e}$
1	77.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
2	86.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
3	73.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
4	57.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
5	54.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
6	77.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
7	57.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
8	57.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
9	57.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
10	66.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
11	72.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
12	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
13	67.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
14	73.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
15	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
16	68.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
17	74.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
18	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
19	67.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
20	76.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
21	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
22	63.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
23	72.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
24	52.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
25	62.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
26	71.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
27	54.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
28	63.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
29	75.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
30	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
31	63.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
32	73.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
33	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
34	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
35	62.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
36	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
37	63.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
38	76.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
39	57.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
40	56.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
41	63.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
42	58.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
43	65.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
44	73.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
45	57.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000

Table D-5, Part 3. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS (Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P _T , psia	a _e	C _{OH} , mol frac.	a ₁	$\frac{a_e - a_1}{a_e}$	a ₂	$\frac{a_e - a_2}{a_e}$	a ₃	$\frac{a_e - a_3}{a_e}$	a ₄	$\frac{a_e - a_4}{a_e}$
71	53.0	115.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
72	73.0	115.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
73	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
74	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
75	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
76	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
77	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
78	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
79	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
100	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
101	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
102	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
103	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
104	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
105	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
106	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
107	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
108	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
109	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
110	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
111	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
112	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
113	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
114	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
115	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
116	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
117	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
118	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
119	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
120	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
121	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
122	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
123	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
124	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
125	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
126	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
127	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
128	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
129	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
130	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
131	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
132	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
133	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
134	55.0	65.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000



Table D-5, Part 4. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS
(Shell Oil 538 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P _T , psia	a _e	C _{φOH} , mol frac.	a ₁	$\frac{a_e - a_1}{a_e}$	a ₂	b	$\frac{a_e - a_2}{a_e}$	a ₃	$\frac{a_e - a_3}{a_e}$	a ₄	$\frac{a_e - a_4}{a_e}$
135	650.0	515.0	0.4988	0.0051	0.4943	0.0005	0.4963	0.4982	0.0006	0.4982	0.0006	0.4981	0.0005
136	651.0	515.0	0.4975	0.0051	0.4970	0.0005	0.4971	0.4970	0.0005	0.4970	0.0005	0.4971	0.0004
137	650.0	515.0	0.4983	0.0051	0.4958	0.0004	0.4959	0.4957	0.0003	0.4957	0.0005	0.4959	0.0004
138	651.0	515.0	0.4937	0.0052	0.4934	0.0003	0.4936	0.4933	0.0001	0.4933	0.0004	0.4935	0.0002
139	651.0	515.0	0.4926	0.0052	0.4922	0.0004	0.4924	0.4920	0.0002	0.4920	0.0006	0.4923	0.0003
140	651.0	515.0	0.4912	0.0052	0.4909	0.0003	0.4912	0.4907	0.0001	0.4907	0.0005	0.4911	0.0001
141	650.0	515.0	0.4901	0.0052	0.4897	0.0004	0.4899	0.4895	0.0001	0.4895	0.0006	0.4899	0.0002
142	650.0	515.0	0.4875	0.0052	0.4873	0.0002	0.4876	0.4870	-0.0001	0.4870	0.0005	0.4875	-0.0001
143	651.0	515.0	0.4863	0.0052	0.4861	0.0002	0.4864	0.4858	-0.0001	0.4858	0.0005	0.4863	-0.0001
144	650.0	515.0	0.4850	0.0052	0.4849	0.0001	0.4852	0.4845	-0.0002	0.4845	0.0005	0.4851	-0.0001
145	651.0	515.0	0.4837	0.0052	0.4836	-0.0001	0.4842	0.4834	-0.0005	0.4834	0.0003	0.4841	-0.0004

a $a_1 = \exp(-4.50 \times 10^{-5} \frac{2386}{RT} C_{\phi OH} - 0.1813 \theta)$

b $a_2 = \exp(-4.44 \times 10^{-5} \frac{2399}{RT} C_{\phi OH} - 0.1829 \theta)$

c $a_3 = \exp(-4.79 \times 10^{-5} \frac{2308}{RT} C_{\phi OH} - 0.1826 \theta)$

d $a_4 = \exp(-4.65 \times 10^{-5} \frac{2353}{RT} C_{\phi OH} - 0.1862 \theta)$

D78113321d

Table D-6, Part 1. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS
(G-93 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp, °F	P _T , psia	a _e	C _{OH} , mol frac.	a ₁	$\frac{a_e - a_1}{a_e}$	a ₂	$\frac{a_e - a_2}{a_e}$
1	325.0	785.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
2	325.0	785.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
3	325.0	785.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
4	375.0	1000.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
5	610.0	1005.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
6	655.0	775.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
7	658.0	775.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
8	660.0	1000.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
9	660.0	315.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
10	660.0	315.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
11	665.0	215.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
12	660.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
13	660.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
14	660.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
15	665.0	1010.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
16	663.0	318.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
17	663.0	317.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
18	665.0	317.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
19	665.0	325.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
20	662.0	265.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
21	664.0	270.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
22	665.0	265.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
23	664.0	270.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
24	665.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
25	665.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
26	665.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
27	665.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
28	668.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
29	665.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
30	664.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
31	668.0	1015.0	0.9982	0.0000	1.0000	-0.0018	1.0000	-0.0018
32	669.0	1015.0	0.9944	0.0000	0.9945	-0.0055	0.9946	-0.0054
33	669.0	1015.0	0.9941	0.0000	0.9942	-0.0059	0.9943	-0.0058
34	669.0	1015.0	0.9892	0.0000	0.9893	-0.0107	0.9896	-0.0104
35	664.0	315.0	1.0000	0.0000	0.9894	-0.0106	0.9897	-0.0103
36	638.0	318.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
37	652.0	315.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
38	668.0	315.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
39	656.0	215.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
40	650.0	265.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
41	656.0	315.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
42	656.0	315.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
43	659.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
44	664.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
45	639.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000

D78113322a

Reproduced from
best available copy.

Table D-6, Part 2. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS
(G-93 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp., °F	P _T , psia	a _e	C _{OH} , mol frac.	a ₁	$\frac{a_e - a_1}{a_e}$	a ₂	$\frac{a_e - a_2}{a_e}$
46	540.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
47	540.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
48	550.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
49	562.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
50	561.0	205.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
51	561.0	205.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
52	560.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
53	539.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
54	535.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
55	535.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
56	570.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
57	570.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
58	542.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
59	547.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
60	547.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
61	547.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
62	542.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
63	542.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
64	553.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
65	553.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
66	550.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
67	550.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
68	546.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
69	546.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
70	546.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
71	561.0	1015.0	0.9582	0.0003	0.9608	-0.0027	0.9620	-0.0039
72	561.0	1015.0	0.9581	0.0004	0.9587	-0.0006	0.9599	-0.0018
73	560.0	1015.0	0.9581	0.0004	0.9579	0.0002	0.9591	-0.0010
74	561.0	1015.0	0.9471	0.0003	0.9508	-0.0037	0.9522	-0.0054
75	561.0	1015.0	0.9469	0.0003	0.9461	0.0009	0.9476	-0.0007
76	558.0	1015.0	0.9509	0.0003	0.9548	-0.0041	0.9560	-0.0054
77	558.0	1015.0	0.9507	0.0003	0.9504	0.0004	0.9517	-0.0011
78	558.0	1015.0	0.9437	0.0003	0.9480	-0.0044	0.9494	-0.0060
79	558.0	1015.0	0.9437	0.0003	0.9479	-0.0045	0.9494	-0.0060
80	558.0	1015.0	0.9435	0.0007	0.9394	0.0044	0.9410	0.0027
81	558.0	1015.0	0.9460	0.0004	0.9699	-0.0020	0.9513	-0.0035
82	556.0	1015.0	0.9474	0.0003	0.9523	-0.0047	0.9537	-0.0061
83	556.0	1015.0	0.9474	0.0004	0.9438	-0.0021	0.9512	-0.0035
84	746.0	1015.0	0.9531	0.0003	0.9553	-0.0023	0.9566	-0.0037
85	746.0	1015.0	0.9530	0.0003	0.9510	0.0021	0.9524	0.0007
86	745.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
87	745.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
88	744.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
89	744.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
90	744.0	1015.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000

D78113322b

Table D-6, Part 3. COMPARISON OF EXPERIMENTAL AND CALCULATED DEACTIVATION RATE CONSTANTS
(G-93 Catalyst, 4 x 6 Mesh Spheres)

Run No.	Temp., °F	P _T , psia	a _e	C _{φOH} , mol frac.	a ₁	a _e - a ₁ a _e	a ₂	a _e - a ₂ a _e
91	745.0	215.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
92	745.0	215.0	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000
93	746.0	215.0	0.9482	0.0003	0.9506	-0.0025	0.9520	-0.0040
94	746.0	215.0	0.9476	0.0005	0.9454	0.0024	0.9469	0.0007
95	661.0	215.0	0.9401	0.0005	0.9405	-0.0004	0.9421	-0.0022
96	661.0	215.0	0.9401	0.0003	0.9455	-0.0057	0.9470	-0.0074
97	560.0	215.0	0.9321	0.0003	0.9373	-0.0057	0.9391	-0.0075
98	560.0	215.0	0.9320	0.0004	0.9340	-0.0021	0.9358	-0.0041
99	538.0	215.0	0.9311	0.0005	0.9242	0.0071	0.9301	0.0010
100	538.0	215.0	0.9310	0.0003	0.9342	-0.0035	0.9360	-0.0055
101	660.0	215.0	0.9359	0.0003	0.9414	-0.0059	0.9431	-0.0077
102	660.0	215.0	0.9357	0.0005	0.9358	0.0000	0.9375	-0.0019
103	745.0	215.0	0.9427	0.0003	0.9448	-0.0022	0.9464	-0.0039
104	745.0	215.0	0.9425	0.0004	0.9418	0.0007	0.9435	-0.0010
105	744.0	215.0	0.9419	0.0003	0.9439	-0.0021	0.9455	-0.0038
106	744.0	215.0	0.9418	0.0005	0.9385	0.0035	0.9402	0.0016
107	658.0	215.0	0.9317	0.0004	0.9339	-0.0024	0.9357	-0.0043
108	658.0	215.0	0.9316	0.0006	0.9290	0.0028	0.9309	0.0007
109	557.0	215.0	0.9249	0.0006	0.9205	0.0047	0.9226	0.0025
110	557.0	215.0	0.9245	0.0003	0.9246	-0.0005	0.9315	-0.0077

a $a_1 = \exp(-4.50 \times 10^{-5} \frac{2386}{RT} - 0.1813 \theta)$

b $a_2 = \exp(-4.44 \times 10^{-5} \frac{2399}{RT} - 0.1829 \theta)$

Reproduced from
best available copy.

D78113322c