CHAPTER 5

DATA TABLES

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DATA TABLES

The literature survey with respect to effective interfacial areas and mass transfer coefficients in packed columns for the cases of absorption without chemical reaction, absorption with chemical reaction and vaporization along with relevant wetted surface area data, presented in Chapter - (2) : Literature Survey could be utilised conveniently to prepare "Data Banks" for effective interfacial areas (a_w, a_p, a_c) and mass transfer coefficients ($K_G a$ $k_G a$, and $k_L a$).

These data banks primarily incorporate the effect of variables such as liquid and gas mass flow rate (L and G) on the relevant parameters (a_w, a_p, a_c, $k_L a$, $K_G a$ etc) and also include packing characteristics(d_p and a_t) as well as the relevant physical properties of the systems (μ_L, μ_G, ρ_L, ρ_G, σ , σ_c, D_L, D_G etc) at experimental conditions.

The information available in the references (150 - 179) and the relevant equations cited in Chapter - 4 : General Considerations hae been used while reporting the physical properties at different experimental conditions.

The compiled data banks are presented in this Chapter in the form of data tables as under :-

Table - (5.1) : Data bank for wetted surface area (a_w).

Table - (5.2) : Data bank for effective interfacial area during physical absorption (a_p).

Table - (5.3) : Data bank for effective interfacial area during chemical absorption (a_c).

Table - (5.4) : Data bank for volumetric liquid side mass transfer coefficient ($k_L a$).

Table - (5.5) : Data bank for gas side mass transfer coefficient during physical absorption.

Table - (5.5 A) : Overall gas side mass transfer coefficient ($K_G a$).

Table - (5.5 B) : Volumetric gas side mass transfer coefficient ($k_G a$).

Table - (5.5 C) : Volumetric gas side mass transfer coefficient during vaporization ($k_G a$).

Table - (5.5 D) : HTU data for vaporization.

Table - (5.6) : Data Bank for true liquid side mass transfer coefficient obtained by Danckwerts model (k_L).

Table - (5.7) : Data Bank (I) for overall gas side mass transfer coefficient during chemical absorption ($K_G a$).

Table - (5.8) : Data Bank (II) for overall gas side mass transfer coefficient during chemical absorption ($K_G a$) : very low concentration of reactive species.

The data bank for a_w (Table - 5.1) consists of 100 data points with twenty one different systems/variations obtained from six experimental investigations (Ref. 5 to 12).

The data bank for a_p (Table 5.2) consists of 100 data points with twenty different systems/variations obtained from four experimental investigations (Ref. 13 to 17).

The data bank for a_c (Table 5.3) consists of 167 data points with thirty two different systems/variations obtained from twenty one experimental investigations (Ref. 19 to 39).

The data bank for $k_L a$ (Table 5.4) consists of 235 data points with thirty four different systems/variations obtained from ten experimental investigations (Ref. 19, 21, 22, 28, 40 to 46).

The data bank for gas side mass transfer coefficients [Table's - (5.5 A), (5.5 B), (5.5 C), (5.5 D)] consists of totally 312 data points with twenty seven different systems/variations obtained from ten experimental investigations (Ref. 41, 47 to 55).

The data bank for true liquid side mass transfer coefficient (Table - 5.6) consists of 30 data points with seven different systems/variations obtained from four experimental investigations (Ref. 22, 36, 37, 38, 56).

The data banks for gas side mass transfer coefficients during chemical reaction $K_G a$ [Table's - (5.7) and (5.8)] consists of total 162 data points in data Bank I (Table 5.7) with fifteen different systems/variations obtained from eight experimental investigations (Ref. 53, 57 to 67). Data Bank II (Table 5.8, for very low concentration of reactive species) consists of 24 data point with five different systems/variations obtained from four experimental investigations (Ref. 59, 64, 66, 67).

Table - (5.1)

Data bank for wetted surface area (a_w).

No	T °C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_w m^2/m^3	a_w/a_t
1	21.0	172.0	998.0	0.974	72.5	1.510	6.781	79.1	0.460
2	21.0	172.0	998.0	0.974	72.5	1.510	12.206	80.8	0.470
3	21.0	172.0	998.0	0.974	72.5	1.510	13.562	110.4	0.642
4	21.0	370.0	998.0	0.974	72.5	1.510	1.356	103.2	0.279
5	21.0	370.0	998.0	0.974	72.5	1.510	3.390	135.8	0.367
6	21.0	370.0	998.0	0.974	72.5	1.510	6.781	166.9	0.451
7	21.0	115.0	998.0	0.974	72.5	1.510	1.356	36.8	0.320
8	21.0	115.0	998.0	0.974	72.5	1.510	3.390	46.0	0.400
9	21.0	115.0	998.0	0.974	72.5	1.510	6.781	57.5	0.500
10	21.0	115.0	998.0	0.974	72.5	1.510	13.562	64.4	0.560
11	15.0	470.0	1000.0	1.120	75.0	1.230	1.500	107.2	0.228
12	15.0	470.0	1000.0	1.120	75.0	1.230	3.000	165.0	0.351
13	25.0	370.0	997.0	0.894	72.0	1.000	4.230	164.6	0.445
14	25.0	370.0	997.0	0.894	72.0	1.000	5.830	188.3	0.509
15	25.0	370.0	997.0	0.894	72.0	1.000	10.850	253.4	0.685
16	25.0	370.0	997.0	0.894	72.0	1.000	13.080	266.4	0.720
17	15.0	370.0	999.0	1.400	60.0	0.833	0.850	88.8	0.240
18	15.0	370.0	999.0	1.400	60.0	0.833	3.400	146.5	0.396
19	15.0	370.0	999.0	1.400	60.0	0.833	5.100	168.4	0.455
20	15.0	370.0	999.0	1.400	60.0	0.833	6.800	185.0	0.500
21	15.0	199.0	999.0	1.400	60.0	0.833	0.500	55.5	0.279
22	15.0	199.0	999.0	1.400	60.0	0.833	1.190	68.1	0.342
23	15.0	199.0	999.0	1.400	60.0	0.833	2.270	87.8	0.441
24	15.0	199.0	999.0	1.400	60.0	0.833	7.200	119.8	0.602
25	25.0	330.0	996.0	0.894	34.0	0.472	0.140	69.3	0.210
26	25.0	330.0	996.0	0.894	34.0	0.472	0.280	92.4	0.280
27	25.0	330.0	996.0	0.894	34.0	0.472	0.550	115.5	0.350
28	25.0	330.0	996.0	0.894	34.0	0.472	1.110	135.3	0.410
29	25.0	330.0	996.0	0.894	34.0	0.472	1.380	148.5	0.450
30	25.0	330.0	996.0	0.894	34.0	0.472	2.780	198.0	0.600
31	25.0	190.0	997.0	0.894	65.0	0.903	0.278	35.5	0.187
32	25.0	190.0	997.0	0.894	65.0	0.903	0.550	41.2	0.217
33	25.0	190.0	997.0	0.894	65.0	0.903	1.110	55.1	0.290
34	25.0	190.0	997.0	0.894	65.0	0.903	2.780	71.3	0.375
35	25.0	190.0	997.0	0.894	65.0	0.903	5.500	93.1	0.490
36	25.0	190.0	997.0	0.894	60.0	0.833	0.140	34.2	0.180
37	25.0	190.0	997.0	0.894	60.0	0.833	0.278	38.0	0.200
38	25.0	190.0	997.0	0.894	60.0	0.833	0.550	47.5	0.250
39	25.0	190.0	997.0	0.894	60.0	0.833	1.110	57.0	0.300
40	25.0	190.0	997.0	0.894	60.0	0.833	1.380	66.5	0.350
41	25.0	190.0	997.0	0.894	60.0	0.833	2.780	79.8	0.420
42	25.0	190.0	997.0	0.894	50.0	0.694	0.140	38.0	0.200
43	25.0	190.0	997.0	0.894	50.0	0.694	0.278	47.5	0.250
44	25.0	190.0	997.0	0.894	50.0	0.694	0.550	58.9	0.310
45	25.0	190.0	997.0	0.894	50.0	0.694	1.110	72.2	0.380

Table - 5.1 (contd.)

No	T ^{o}C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_w m^2/m^3	a_w/a_t
46	25.0	190.0	997.0	0.894	50.0	0.694	1.380	76.0	0.400
47	25.0	190.0	997.0	0.894	50.0	0.694	2.780	98.8	0.520
48	25.0	190.0	997.0	0.894	38.0	0.528	0.140	43.7	0.230
49	25.0	190.0	997.0	0.894	38.0	0.528	0.278	57.0	0.300
50	25.0	190.0	997.0	0.894	38.0	0.528	0.550	72.2	0.380
51	25.0	190.0	997.0	0.894	38.0	0.528	1.110	91.2	0.480
52	25.0	190.0	997.0	0.894	38.0	0.528	1.380	98.8	0.520
53	25.0	190.0	997.0	0.894	38.0	0.528	2.780	117.8	0.620
54	25.0	190.0	1080.0	1.680	62.0	0.861	0.140	28.5	0.150
55	25.0	190.0	1080.0	1.680	62.0	0.861	0.280	34.2	0.180
56	25.0	190.0	1080.0	1.680	62.0	0.861	0.550	50.9	0.268
57	25.0	190.0	1080.0	1.680	62.0	0.861	1.400	57.0	0.300
58	25.0	190.0	1080.0	1.680	62.0	0.861	2.780	76.0	0.400
59	25.0	190.0	1080.0	1.680	62.0	0.861	4.150	85.1	0.448
60	25.0	190.0	1140.0	3.800	66.0	0.917	0.140	30.4	0.160
61	25.0	190.0	1140.0	3.800	66.0	0.917	0.280	35.2	0.185
62	25.0	190.0	1140.0	3.800	66.0	0.917	0.560	52.3	0.275
63	25.0	190.0	1140.0	3.800	66.0	0.917	1.400	58.9	0.310
64	25.0	190.0	1140.0	3.800	66.0	0.917	1.670	65.6	0.345
65	25.0	190.0	1140.0	3.800	66.0	0.917	2.100	72.2	0.380
66	25.0	190.0	1140.0	3.800	66.0	0.917	2.780	77.9	0.410
67	25.0	190.0	1140.0	3.800	66.0	0.917	4.150	85.5	0.450
68	25.0	132.0	1150.0	3.800	60.0	0.833	0.140	26.4	0.200
69	25.0	132.0	1150.0	3.800	60.0	0.833	0.280	33.0	0.250
70	25.0	132.0	1150.0	3.800	60.0	0.833	1.400	52.8	0.400
71	25.0	132.0	1150.0	3.800	60.0	0.833	2.780	54.1	0.410
72	25.0	585.0	998.0	1.110	67.0	1.098	0.560	114.1	0.195
73	25.0	585.0	998.0	1.110	67.0	1.098	1.160	155.0	0.265
74	25.0	585.0	998.0	1.110	67.0	1.098	1.680	175.5	0.300
75	25.0	585.0	998.0	1.110	67.0	1.098	2.240	189.5	0.324
76	25.0	585.0	998.0	1.110	67.0	1.098	2.780	200.7	0.343
77	25.0	585.0	998.0	1.010	46.0	0.754	0.560	136.9	0.234
78	25.0	585.0	998.0	1.010	46.0	0.754	1.160	181.4	0.310
79	25.0	585.0	998.0	1.010	46.0	0.754	1.680	204.8	0.350
80	25.0	585.0	998.0	1.010	46.0	0.754	2.780	265.0	0.453
81	25.0	585.0	970.0	2.030	45.0	0.738	0.560	169.6	0.290
82	25.0	585.0	970.0	2.030	45.0	0.738	1.160	201.8	0.345
83	25.0	585.0	970.0	2.030	45.0	0.738	1.680	231.1	0.395
84	25.0	585.0	970.0	2.030	45.0	0.738	2.240	250.4	0.428
85	25.0	585.0	970.0	2.030	45.0	0.738	2.780	264.4	0.452
86	25.0	585.0	1070.0	2.500	75.0	1.230	0.560	105.3	0.180
87	25.0	585.0	1070.0	2.500	75.0	1.230	1.160	140.4	0.240
88	25.0	585.0	1070.0	2.500	75.0	1.230	1.680	162.6	0.278
89	25.0	585.0	1070.0	2.500	75.0	1.230	2.240	187.2	0.320
90	25.0	585.0	1070.0	2.500	75.0	1.230	2.780	186.0	0.318
91	25.0	585.0	1150.0	10.800	75.0	1.230	0.560	96.5	0.165
92	25.0	585.0	1150.0	10.800	75.0	1.230	1.160	114.1	0.195
93	25.0	585.0	1150.0	10.800	75.0	1.230	1.680	143.3	0.245

Table - 5.1 (contd.)

No	T ^{o}C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_w m^2/m^3	a_w/a_t
94	25.0	585.0	1150.0	10.800	75.0	1.230	2.240	158.0	0.270
95	25.0	585.0	1150.0	10.800	75.0	1.230	2.780	166.7	0.285
96	25.0	585.0	1140.0	3.750	76.0	1.246	0.560	99.5	0.170
97	25.0	585.0	1140.0	3.750	76.0	1.246	1.160	134.6	0.230
98	25.0	585.0	1140.0	3.750	76.0	1.246	1.680	152.1	0.260
99	25.0	585.0	1140.0	3.750	76.0	1.246	2.240	163.8	0.280
100	25.0	585.0	1140.0	3.750	76.0	1.246	2.780	175.5	0.300

Relevant details regarding Table - 5.1 :

Data No. System and Packing characteristics.

1-3 Water - Air : Napthalene R.R., σ_c = 48 mN/m
d_p = 0.025 m, Ref. (5,6).

4-10 Water - Air : Napthalene R.R., σ_c = 48 mN/m
No 4-6, d_p = 0.013 m ; No 7-10, d_p = 0.037 m. Ref. (7).

11-12 Water - Air : Ceramic R.R., σ_c = 61 mN/m
d_p = 0.0095 m, Ref. (8).

13-16 Water without gas : Paper R.R., σ_c = 72 mN/m
d_p = 0.013 m, Ref. (9).

17-24 Water and different solvents without gas : Paper R.R.
σ_c = 72 mN/m , No 17-20, d_p = 0.013 m ; No 21-24,
d_p = 0.025 m. Ref. (10).

25-71 Water and different solvents without gas : Paper R.R.
σ_c = 72 mN/m, No 25-30, d_p = 0.015 m; No 31-67, d_p = 0.025 m;
No 68-71, d_p = 0.035 m. Ref. (11).

72-100 Water and different solvents without gas : Ceramic R.R.
σ_c = 61 mn/m, d_p = 0.008 m. Ref. (12).

Table - (5.2)

Data bank for effective interfacial area during physical absorption (a_p)

No	T ^oC	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_p m^2/m^3	a_p/a_t
1	20.0	195.0	998.2	1.008	72.8	1.193	0.673	26.1	0.134
2	20.0	195.0	998.2	1.008	72.8	1.193	2.020	47.6	0.244
3	20.0	195.0	998.2	1.008	72.8	1.193	3.366	59.7	0.306
4	20.0	195.0	998.2	1.008	72.8	1.193	6.059	71.9	0.369
5	20.0	195.0	998.2	1.008	72.8	1.193	10.098	86.8	0.445
6	20.0	134.0	998.2	1.008	72.8	1.193	0.673	21.4	0.159
7	20.0	134.0	998.2	1.008	72.8	1.193	2.020	43.8	0.326
8	20.0	134.0	998.2	1.008	72.8	1.193	3.366	57.8	0.431
9	20.0	134.0	998.2	1.008	72.8	1.193	6.059	65.6	0.490
10	20.0	134.0	998.2	1.008	72.8	1.193	10.098	75.3	0.562
11	20.0	102.0	998.2	1.008	72.8	1.193	2.020	40.0	0.392
12	20.0	102.0	998.2	1.008	72.8	1.193	6.059	64.3	0.630
13	20.0	205.0	998.2	1.008	72.8	1.193	2.020	52.8	0.257
14	20.0	205.0	998.2	1.008	72.8	1.193	6.059	73.3	0.358
15	20.0	144.0	998.2	1.008	72.8	1.193	2.020	40.8	0.284
16	20.0	144.0	998.2	1.008	72.8	1.193	6.059	62.4	0.434
17	20.0	195.0	998.2	1.008	72.8	1.193	0.204	11.6	0.060
18	20.0	195.0	998.2	1.008	72.8	1.193	0.312	14.5	0.074
19	20.0	195.0	998.2	1.008	72.8	1.193	0.440	21.0	0.108
20	20.0	195.0	998.2	1.008	72.8	1.193	0.622	19.4	0.099
21	20.0	195.0	998.2	1.008	72.8	1.193	1.392	30.8	0.158
22	20.0	195.0	998.2	1.008	72.8	1.193	2.533	36.5	0.187
23	20.0	195.0	998.2	1.008	72.8	1.193	4.716	52.2	0.268
24	20.0	195.0	998.2	1.008	72.8	1.193	7.947	72.0	0.369
25	20.0	195.0	998.2	1.008	72.8	1.193	0.358	19.7	0.101
26	20.0	195.0	998.2	1.008	72.8	1.193	1.240	33.5	0.172
27	20.0	195.0	998.2	1.008	72.8	1.193	2.043	45.4	0.233
28	20.0	195.0	998.2	1.008	72.8	1.193	3.116	57.2	0.293
29	20.0	195.0	998.2	1.008	72.8	1.193	6.265	70.9	0.364
30	20.0	348.0	998.2	1.008	72.8	1.193	0.585	22.3	0.064
31	20.0	348.0	998.2	1.008	72.8	1.193	0.725	32.5	0.093
32	20.0	348.0	998.2	1.008	72.8	1.193	0.927	30.1	0.087
33	20.0	348.0	998.2	1.008	72.8	1.193	0.203	13.9	0.040
34	20.0	348.0	998.2	1.008	72.8	1.193	0.529	27.7	0.080
35	20.0	348.0	998.2	1.008	72.8	1.193	0.845	32.3	0.093
36	20.0	348.0	998.2	1.008	72.8	1.193	2.043	43.9	0.126
37	15.0	195.0	796.0	0.669	23.0	0.377	0.239	21.3	0.109
38	15.0	195.0	796.0	0.669	23.0	0.377	0.496	33.5	0.172
39	15.0	195.0	796.0	0.669	23.0	0.377	0.728	41.8	0.214
40	15.0	330.0	999.0	1.144	73.5	1.205	0.280	21.8	0.066
41	15.0	330.0	999.0	1.144	73.5	1.205	0.550	29.6	0.090
42	15.0	330.0	999.0	1.144	73.5	1.205	0.830	43.7	0.132
43	15.0	330.0	999.0	1.144	73.5	1.205	1.120	46.8	0.142
44	15.0	330.0	999.0	1.144	73.5	1.205	1.670	54.6	0.165
45	15.0	330.0	999.0	1.144	73.5	1.205	2.220	58.7	0.178
46	15.0	330.0	999.0	1.144	73.5	1.205	2.780	64.0	0.194

Table - 5.2 (contd.)

No	T °C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_p m^2/m^3	a_p/a_t
47	15.0	330.0	999.0	1.144	73.5	1.205	5.500	87.4	0.265
48	15.0	207.0	999.0	1.144	73.5	1.205	2.220	70.4	0.340
49	15.0	207.0	999.0	1.144	73.5	1.205	2.780	76.6	0.370
50	15.0	207.0	999.0	1.144	73.5	1.205	5.500	104.5	0.505
51	25.0	330.0	787.7	0.523	21.9	0.359	0.280	54.6	0.165
52	25.0	330.0	787.7	0.523	21.9	0.359	0.550	65.5	0.199
53	25.0	330.0	787.7	0.523	21.9	0.359	0.830	71.8	0.217
54	25.0	330.0	787.7	0.523	21.9	0.359	1.120	93.6	0.284
55	25.0	330.0	787.7	0.523	21.9	0.359	1.670	109.2	0.331
56	25.0	330.0	787.7	0.523	21.9	0.359	2.220	124.8	0.378
57	25.0	330.0	787.7	0.523	21.9	0.359	2.780	131.0	0.397
58	25.0	330.0	787.7	0.523	21.9	0.359	5.500	188.8	0.572
59	25.0	207.0	787.7	0.523	21.9	0.359	0.550	64.2	0.310
60	25.0	207.0	787.7	0.523	21.9	0.359	0.830	82.8	0.400
61	25.0	207.0	787.7	0.523	21.9	0.359	1.120	89.0	0.430
62	25.0	207.0	787.7	0.523	21.9	0.359	1.670	105.6	0.510
63	25.0	207.0	787.7	0.523	21.9	0.359	2.220	124.2	0.600
64	25.0	207.0	787.7	0.523	21.9	0.359	2.780	140.8	0.680
65	25.0	330.0	894.0	1.427	30.0	0.492	2.780	109.2	0.331
66	25.0	207.0	894.0	1.427	30.0	0.492	2.780	120.1	0.580
67	25.0	330.0	953.0	1.600	40.0	0.656	2.780	90.5	0.274
68	25.0	207.0	953.0	1.600	40.0	0.656	2.780	104.5	0.505
69	25.0	330.0	981.0	1.185	55.0	0.902	2.780	78.0	0.236
70	25.0	207.0	981.0	1.185	55.0	0.902	2.780	86.9	0.420
71	15.0	330.0	1100.0	3.500	70.0	1.148	1.390	49.9	0.151
72	15.0	330.0	1100.0	3.500	70.0	1.148	2.780	65.5	0.199
73	15.0	330.0	1100.0	3.500	70.0	1.148	5.560	90.5	0.274
74	15.0	330.0	1100.0	3.500	70.0	1.148	4.200	74.9	0.227
75	15.0	330.0	1140.0	3.730	68.0	1.115	1.390	49.9	0.151
76	15.0	330.0	1140.0	3.730	68.0	1.115	2.780	65.5	0.199
77	15.0	330.0	1140.0	3.730	68.0	1.115	4.200	74.9	0.227
78	15.0	330.0	1140.0	3.730	68.0	1.115	5.560	90.5	0.274
79	13.5	348.0	999.0	1.190	73.7	1.208	0.271	21.9	0.063
80	13.0	348.0	999.0	1.206	73.8	1.210	0.281	20.6	0.059
81	13.6	348.0	999.0	1.186	73.7	1.208	0.670	28.2	0.081
82	13.2	348.0	999.0	1.200	73.8	1.209	0.681	31.1	0.089
83	12.6	348.0	999.0	1.226	73.9	1.211	1.238	34.9	0.100
84	14.2	348.0	999.0	1.168	73.6	1.207	1.372	40.5	0.116
85	13.5	348.0	999.0	1.190	73.7	1.208	0.270	20.3	0.058
86	13.6	348.0	999.0	1.186	73.7	1.208	0.273	21.1	0.061
87	16.3	348.0	999.0	1.106	73.3	1.202	0.290	19.6	0.056
88	17.0	348.0	999.0	1.087	73.2	1.200	0.681	27.9	0.080
89	13.7	348.0	999.0	1.184	73.7	1.208	0.700	28.3	0.081
90	14.8	348.0	999.0	1.147	73.5	1.205	1.397	45.4	0.131
91	14.9	195.0	999.2	1.144	73.5	1.205	0.673	23.9	0.122
92	13.8	195.0	999.2	1.190	73.7	1.208	0.681	23.1	0.118
93	15.4	195.0	999.2	1.144	73.4	1.203	0.708	27.2	0.140
94	10.7	195.0	999.2	1.270	74.1	1.215	1.329	43.7	0.224
95	11.9	195.0	999.2	1.239	73.9	1.211	4.055	75.9	0.389
96	17.2	195.0	999.2	1.082	73.2	1.199	0.684	27.2	0.139

Table - 5.2 (contd.)

No	T °C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_p m^2/m^3	a_p/a_t
97	14.2	195.0	999.2	1.168	73.6	1.207	0.703	26.1	0.134
98	13.2	195.0	999.2	1.200	73.8	1.209	0.745	24.6	0.126
99	15.8	195.0	999.2	1.120	73.3	1.202	1.496	41.6	0.213
100	14.1	195.0	999.2	1.171	73.6	1.207	4.313	84.6	0.434

Relevant details regarding Table - 5.2 :

Data No.	System and Packing characteristics.
1-16	Absorption of Ammonia in water. No.1-12, Ceramic R.R., σ_c = 61 mN/m. No. 1-5, d_p = 0.025 m, No.6-10, d_p = 0.038 m, No.11 & 12, d_p = 0.05m, No. 13-16, Ceramic B.S., No.13 & 14 d_p = 0.025 m, and No.15-16, d_p = 0.038m. Ref.(13).
17-36	Absorption of CO_2 in Water. Ceramic R.R., σ_c = 61 mN/m , No 17-29, d_p = 0.025 m, No 30-36, d_p = 0.015 m, Ref.(14). (Packed depths : No.17-24 & 30-32 = 0.4m, No. 24-29 and 33-36 = 0.2m)
37-39	Absorption of CO_2 in Methanol. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m. Ref.(14).
40-50	Absorption of CO_2 in Water. Ceramic R.R., σ_c = 61 mN/m, No. 40-47, d_p = 0.015 m, No. 48-50 d_p = 0.025 m, Ref.(15).
51-64	Absorption of CO_2 in Methanol. Ceramic R.R., σ_c = 61 mN/m, No. 51-58, d_p = 0.015 m, No. 59-64, d_p = 0.025 m, Ref.(15).
65-70	Absorption of CO_2 in aqueous Methanol solutions. Methanol concentrations :- No.65-66, 60%, No.67-68, 30%, No. 69-70, 10% . Ceramic R.R., σ_c= 61 mN/m. No. 65,67,69. d_p = 0.015 m, No. 66,68,70, d_p = 0.025 m, Ref.(15).
71-78	Absorption of CO_2 in Cane sugar solutions. No.71-74, 5%, No. 75-78, 10%, Ceramic R.R., σ_c = 61 mN/m, d_p = 0.015m, Ref.(15).
79-100	Absorption of Methanol vapours in water. Ceramic R.R., σ_c = 61 mN/m, No. 79-90, d_p = 0.015m, 91-100, d_p = 0.025 m, Ref.(16,17). (Packed depth : No.79-84 & 91-95 = 0.2m ; No.85-90 & 96-100 = 0.1m).

Table - (5.3)

Data bank for effective interfacial area during Chemical absorption (a_c).

No.	T ^{o}C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L $kg/m^2 s$	a_c m^2/m^3	a_c/a_t
1	25.0	370.0	1100.0	1.400	75.0	1.230	1.600	106.0	0.286
2	32.5	370.0	980.0	0.800	70.0	1.148	1.316	134.0	0.362
3	32.5	370.0	980.0	0.800	70.0	1.148	2.562	141.0	0.381
4	32.5	370.0	980.0	0.800	70.0	1.148	3.861	154.0	0.416
5	25.0	370.0	1040.0	1.055	74.0	1.213	0.749	82.0	0.222
6	25.0	370.0	1040.0	1.055	74.0	1.213	1.508	97.0	0.262
7	25.0	370.0	1040.0	1.055	74.0	1.213	2.246	120.0	0.324
8	25.0	370.0	1040.0	1.055	74.0	1.213	3.016	127.5	0.345
9	25.0	370.0	1040.0	1.055	74.0	1.213	3.765	144.5	0.391
10	20.0	130.0	1055.0	1.220	75.0	1.230	4.621	63.0	0.485
11	20.0	130.0	1055.0	1.220	75.0	1.230	6.024	78.0	0.600
12	20.0	130.0	1055.0	1.220	75.0	1.230	9.574	92.7	0.713
13	20.0	130.0	1055.0	1.220	75.0	1.230	12.048	110.0	0.846
14	20.0	130.0	1055.0	1.220	75.0	1.230	13.820	119.0	0.915
15	30.0	470.0	1624.0	8.900	55.0	0.902	2.582	128.0	0.272
16	30.0	470.0	1624.0	8.900	55.0	0.902	4.628	156.0	0.332
17	30.0	470.0	1624.0	8.900	55.0	0.902	6.740	172.0	0.366
18	32.0	470.0	1074.0	1.250	73.2	1.200	1.514	126.0	0.268
19	32.0	470.0	1074.0	1.250	73.2	1.200	2.363	142.0	0.302
20	31.5	470.0	1074.0	1.250	73.2	1.200	2.880	154.0	0.328
21	31.5	470.0	1074.0	1.250	73.2	1.200	3.620	168.0	0.357
22	31.0	470.0	1074.0	1.250	73.2	1.200	4.317	179.0	0.381
23	31.0	470.0	1074.0	1.250	73.2	1.200	5.060	187.0	0.398
24	31.0	470.0	1074.0	1.250	73.2	1.200	5.860	190.0	0.404
25	31.5	470.0	1074.0	1.250	73.2	1.200	1.417	141.0	0.300
26	31.0	470.0	1074.0	1.250	73.2	1.200	2.825	178.0	0.379
27	31.0	470.0	1074.0	1.250	73.2	1.200	4.275	206.0	0.438
28	31.8	470.0	1074.0	1.250	73.2	1.200	1.493	143.0	0.304
29	31.5	470.0	1074.0	1.250	73.2	1.200	2.940	181.0	0.385
30	31.5	470.0	1074.0	1.250	73.2	1.200	4.430	208.0	0.443
31	31.0	470.0	1074.0	1.250	73.2	1.200	5.735	220.0	0.468
32	31.5	190.0	1074.0	1.250	73.2	1.200	2.803	74.5	0.392
33	31.0	190.0	1074.0	1.250	73.2	1.200	5.810	101.0	0.532
34	31.0	470.0	1001.0	1.290	64.0	1.049	1.430	127.0	0.270
35	31.0	470.0	1001.0	1.290	64.0	1.049	1.700	134.0	0.285
36	31.0	470.0	1001.0	1.290	64.0	1.049	2.572	156.0	0.332
37	31.0	470.0	1001.0	1.290	64.0	1.049	3.433	168.0	0.357
38	31.0	470.0	1001.0	1.290	64.0	1.049	4.020	180.0	0.383
39	30.0	470.0	1300.0	2.400	74.2	1.216	1.885	131.0	0.279
40	30.0	470.0	1300.0	2.400	74.2	1.216	3.835	160.0	0.340
41	30.0	470.0	1300.0	2.400	74.2	1.216	5.395	183.0	0.389
42	30.0	470.0	1300.0	2.400	74.2	1.216	6.890	185.0	0.394
43	30.0	470.0	1300.0	2.460	74.2	1.216	4.875	171.0	0.364
44	30.0	470.0	1300.0	2.460	74.2	1.216	3.835	164.0	0.349
45	30.0	470.0	1300.0	2.460	74.2	1.216	2.275	142.0	0.302
46	30.0	470.0	1068.0	0.905	72.0	1.180	2.189	136.0	0.289
47	30.0	470.0	1068.0	0.905	72.0	1.180	5.180	180.0	0.383
48	30.0	470.0	1100.0	1.100	70.0	1.148	2.200	140.0	0.298
49	30.0	470.0	1100.0	1.100	70.0	1.148	3.036	152.0	0.323

Table - 5.3 (contd.)

No.	T °C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_c m^2/m^3	a_c/a_t
50	30.0	470.0	1100.0	1.100	70.0	1.148	4.642	180.0	0.383
51	30.0	470.0	1010.0	0.900	71.2	1.167	2.171	147.0	0.313
52	30.0	470.0	1010.0	0.900	71.2	1.167	2.757	160.0	0.340
53	30.0	470.0	1010.0	0.900	71.2	1.167	3.918	175.0	0.372
54	30.0	470.0	1010.0	0.900	71.2	1.167	4.747	181.0	0.385
55	30.0	470.0	1016.0	1.000	72.5	1.189	1.778	138.0	0.294
56	30.0	470.0	1016.0	1.000	72.5	1.189	2.641	147.0	0.313
57	30.0	470.0	1016.0	1.000	72.5	1.189	3.500	173.0	0.368
58	30.0	470.0	1016.0	1.000	72.5	1.189	5.537	182.0	0.387
59	25.0	130.0	1087.0	1.224	74.0	1.213	5.440	64.0	0.492
60	25.0	130.0	1087.0	1.224	74.0	1.213	7.070	82.0	0.631
61	25.0	130.0	1087.0	1.224	74.0	1.213	10.330	105.0	0.808
62	25.0	130.0	1087.0	1.224	74.0	1.213	15.220	127.0	0.977
63	25.0	130.0	1087.0	1.224	74.0	1.213	23.370	145.0	1.115
64	30.0	330.0	1070.0	1.080	73.2	1.200	0.527	79.2	0.240
65	30.0	330.0	1070.0	1.080	73.2	1.200	1.611	105.6	0.320
66	30.0	330.0	1070.0	1.080	73.2	1.200	2.770	125.4	0.380
67	30.0	330.0	1070.0	1.080	73.2	1.200	5.550	155.1	0.470
68	30.0	330.0	1070.0	1.080	73.2	1.200	10.200	178.2	0.540
69	30.0	330.0	1070.0	1.080	73.2	1.200	16.600	198.0	0.600
70	30.0	203.0	1070.0	1.080	73.2	1.200	11.110	121.8	0.600
71	30.0	203.0	1070.0	1.080	73.2	1.200	22.220	148.1	0.730
72	25.0	370.0	1037.0	1.220	75.0	1.230	0.500	76.0	0.205
73	25.0	370.0	1037.0	1.220	75.0	1.230	1.080	114.0	0.308
74	25.0	370.0	1037.0	1.220	75.0	1.230	2.230	133.0	0.359
75	25.0	370.0	1037.0	1.220	75.0	1.230	3.050	148.2	0.401
76	25.0	370.0	1037.0	1.220	75.0	1.230	4.460	171.0	0.462
77	30.0	370.0	1080.0	1.320	74.0	1.213	1.170	114.0	0.308
78	30.0	370.0	1080.0	1.320	74.0	1.213	1.900	125.4	0.339
79	30.0	370.0	1080.0	1.320	74.0	1.213	3.350	144.4	0.390
80	30.0	370.0	1080.0	1.320	74.0	1.213	5.600	163.4	0.442
81	30.0	370.0	1080.0	1.320	74.0	1.213	9.700	182.4	0.493
82	30.0	370.0	1080.0	1.320	74.0	1.213	12.000	190.0	0.514
83	28.5	190.0	1024.0	0.963	72.5	1.189	1.843	66.0	0.347
84	28.7	190.0	1024.0	0.963	72.5	1.189	3.215	93.0	0.489
85	29.2	190.0	1024.0	0.928	72.5	1.189	4.610	100.0	0.526
86	29.2	190.0	1024.0	0.928	72.5	1.189	5.530	108.0	0.568
87	26.2	190.0	1024.0	0.980	72.5	1.189	7.168	132.0	0.695
88	26.2	190.0	1024.0	0.980	72.5	1.189	10.752	130.0	0.684
89	26.2	190.0	1024.0	0.980	72.5	1.189	8.345	130.0	0.684
90	26.0	190.0	1024.0	1.000	72.0	2.599	1.587	27.0	0.142
91	26.0	190.0	1024.0	1.000	72.0	2.599	3.010	36.0	0.189
92	20.0	460.0	1090.0	1.380	75.0	1.027	1.570	169.0	0.367
93	20.0	460.0	1090.0	1.380	75.0	1.027	2.360	206.0	0.448
94	20.0	460.0	1090.0	1.380	75.0	1.027	3.140	227.0	0.493
95	20.0	460.0	1090.0	1.380	75.0	1.027	3.920	258.0	0.561
96	20.0	460.0	1090.0	1.380	75.0	1.027	4.710	268.0	0.583
97	20.0	460.0	1090.0	1.380	75.0	1.027	6.280	284.0	0.617
98	20.0	330.0	1060.0	1.230	74.1	1.215	0.530	72.6	0.220
99	20.0	330.0	1060.0	1.230	74.1	1.215	1.696	107.3	0.325
100	20.0	330.0	1060.0	1.230	74.1	1.215	3.392	136.0	0.412

Table – 5.3 (contd.)

No.	T ^{o}C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_c m^2/m^3	a_c/a_t
101	20.0	330.0	1060.0	1.230	74.1	1.215	6.593	208.0	0.630
102	20.0	330.0	1060.0	1.230	74.1	2.675	0.530	24.0	0.073
103	20.0	330.0	1060.0	1.230	74.1	2.675	1.696	43.0	0.130
104	20.0	330.0	1060.0	1.230	74.1	2.675	3.392	49.5	0.150
105	20.0	330.0	1060.0	1.230	74.1	2.675	6.593	65.4	0.198
106	20.0	330.0	1060.0	1.230	74.1	2.245	0.530	33.0	0.100
107	20.0	330.0	1060.0	1.230	74.1	2.245	1.696	46.5	0.141
108	20.0	330.0	1060.0	1.230	74.1	2.245	3.392	59.6	0.181
109	20.0	330.0	1060.0	1.230	74.1	2.245	6.593	81.0	0.245
110	20.0	330.0	1060.0	1.230	74.1	2.245	13.250	107.5	0.326
111	20.0	460.0	1090.0	1.380	75.0	1.641	2.338	92.7	0.201
112	20.0	460.0	1090.0	1.380	75.0	1.641	3.115	107.4	0.234
113	20.0	460.0	1090.0	1.380	75.0	1.641	3.918	121.9	0.265
114	20.0	460.0	1090.0	1.380	75.0	1.641	4.733	131.8	0.286
115	20.0	313.0	1060.0	1.230	74.1	1.215	0.550	60.7	0.194
116	20.0	313.0	1060.0	1.230	74.1	1.215	1.650	92.0	0.294
117	20.0	313.0	1060.0	1.230	74.1	1.215	3.300	112.7	0.360
118	20.0	302.0	1060.0	1.230	74.1	1.215	3.300	102.1	0.338
119	20.0	302.0	1060.0	1.230	74.1	1.215	5.940	140.4	0.465
120	20.0	302.0	1060.0	1.230	74.1	1.215	8.640	153.4	0.508
121	20.0	323.0	1060.0	1.230	74.1	2.675	1.096	35.5	0.110
122	20.0	323.0	1060.0	1.230	74.1	2.675	1.925	43.6	0.135
123	20.0	292.0	1060.0	1.230	74.1	2.245	0.550	33.6	0.115
124	20.0	292.0	1060.0	1.230	74.1	2.245	1.650	44.3	0.152
125	20.0	292.0	1060.0	1.230	74.1	2.245	3.300	57.8	0.198
126	20.0	291.0	1060.0	1.230	74.1	2.245	0.550	28.2	0.097
127	20.0	291.0	1060.0	1.230	74.1	2.245	3.300	50.6	0.174
128	20.0	291.0	1060.0	1.230	74.1	2.245	5.940	59.3	0.204
129	20.0	291.0	1060.0	1.230	74.1	2.245	8.640	81.5	0.280
130	20.0	310.0	1060.0	1.230	74.1	2.245	0.550	28.0	0.090
131	20.0	310.0	1060.0	1.230	74.1	2.245	3.300	56.0	0.181
132	20.0	310.0	1060.0	1.230	74.1	2.245	5.940	77.5	0.250
133	20.0	310.0	1060.0	1.230	74.1	2.245	8.640	93.0	0.300
134	20.0	288.0	1060.0	1.230	74.1	2.245	0.550	23.6	0.082
135	20.0	288.0	1060.0	1.230	74.1	2.245	3.300	53.0	0.184
136	20.0	288.0	1060.0	1.230	74.1	2.245	5.940	67.0	0.233
137	20.0	292.0	1060.0	1.230	74.1	1.372	0.550	51.4	0.176
138	20.0	292.0	1060.0	1.230	74.1	1.372	1.650	77.1	0.264
139	20.0	292.0	1060.0	1.230	74.1	1.372	3.300	97.8	0.335
140	20.0	291.0	1060.0	1.230	74.1	1.372	0.550	44.5	0.153
141	20.0	291.0	1060.0	1.230	74.1	1.372	5.940	137.9	0.474
142	20.0	291.0	1060.0	1.230	74.1	1.372	8.640	116.4	0.400
143	20.0	310.0	1060.0	1.230	74.1	1.372	3.300	114.0	0.368
144	20.0	310.0	1060.0	1.230	74.1	1.372	5.940	137.6	0.444
145	20.0	310.0	1060.0	1.230	74.1	1.372	8.650	140.7	0.454
146	20.0	288.0	1060.0	1.230	74.1	1.372	3.300	95.0	0.330
147	20.0	288.0	1060.0	1.230	74.1	1.372	5.940	105.7	0.367
148	20.0	318.0	1060.0	1.230	74.1	1.372	3.300	109.7	0.345
149	20.0	318.0	1060.0	1.230	74.1	1.372	5.940	135.0	0.425
150	20.0	318.0	1060.0	1.230	74.1	1.372	8.640	150.0	0.472
151	25.0	290.0	1156.5	1.403	75.6	2.290	1.590	43.7	0.151
152	25.0	290.0	1156.5	1.403	75.6	2.290	3.132	52.8	0.182

Table - 5.3 (contd.)

No.	T ^{o}C	a_t m^2/m^3	ρ_L kg/m^3	μ_L mNs/m^2	σ mN/m	σ/σ_c	L kg/m^2s	a_c m^2/m^3	a_c/a_t
153	25.0	290.0	1156.5	1.403	75.6	2.290	4.880	61.4	0.212
154	25.0	290.0	1156.5	1.403	75.6	2.290	6.100	71.2	0.246
155	25.0	390.0	1176.0	1.530	78.0	1.068	9.643	199.0	0.510
156	25.0	390.0	1176.0	1.530	78.0	1.068	6.468	175.5	0.450
157	25.0	390.0	1176.0	1.530	78.0	1.068	3.528	144.0	0.369
158	25.0	390.0	1176.0	1.530	78.0	1.068	2.000	123.0	0.315
159	25.0	390.0	1200.0	1.860	78.0	1.068	10.680	215.8	0.553
160	25.0	390.0	1200.0	1.860	78.0	1.068	8.520	201.0	0.515
161	25.0	390.0	1200.0	1.860	78.0	1.068	5.160	171.0	0.438
162	25.0	390.0	1200.0	1.860	78.0	1.068	3.600	151.0	0.387
163	25.0	390.0	1200.0	1.860	78.0	1.068	2.280	132.8	0.341
164	25.0	467.0	1156.5	1.403	75.6	1.008	3.490	161.0	0.345
165	25.0	467.0	1156.5	1.403	75.6	1.008	4.080	176.0	0.377
166	25.0	467.0	1156.5	1.403	75.6	1.008	4.664	188.0	0.403
167	25.0	467.0	1156.5	1.403	75.6	1.008	5.830	204.0	0.437

Relevant details regarding Table - 5.3 :

Data No — System and Packing Characteristics.

1. Absorption of CO_2 into sodium carbonate-bicarbonate buffers. Ceramic R.R., σ_c = 61mN/m, d_p = 0.013 m, Ref.(19).

2-4 Absorption of CO_2 into aqueous ammonia solutions. Ceramic R.R., σ_c = 61mN/m, d_p = 0.013 m, Ref.(20).

5-9 Absorption of CO_2 into 0.2 M Na_2CO_3 + 0.2 M $NaHCO_3$ Buffer solutions. Ceramic R.R., σ_c = 61mN/m, d_p = 0.013 m, Ref.(21).

10-14 Absorption of CO_2 into 0.6 M K_2CO_3 + 0.2 M $KHCO_3$ Buffer solutions Ceramic R.R., σ_c = 61mN/m, d_p = 0.038 m, Ref.(22).

15-17 Absorption of isobutylene into 11.5 M H_2SO_4. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.0095 m, Ref.(23).

18-33 Absorption of CO_2 into 1.8 M NaOH solutions. Ceramic R.R., σ_c = 61mN/m, No 18-31, d_p = 0.0095 m, No 32-33, d_p = 0.025 m, Ref.(24).

34-38 Absorption of CO_2 into 1.7 M MEA solutions. Ceramic R.R., σ_c = 61mN/m, d_p = 0.0095 m, Ref.(24).

39-50 Absorption of O_2 into aqueous cuprous chloride solutions. Concentration of HCl, CuCl and $CuCl_2$ as mentioned below :- No. 39-42 (0.6 M, 0.16 M, 2.46 M), No.43-45 (0.2 M, 0.4 M, 2.84 M), No.46-47 (0.85 M, 0.116 M, 0.85 M), No. 48-50 (5 M, 0.057-0.232 M,). Ceramic R.R., σ_c = 61 mN/m, d_p = 0.0095 m, Ref.(25).

Table - 5.3 (contd.)

51-58	Absorption of O_2 into $Na_2S_2O_4$ + 0.5 M NaOH solutions. No 51-54,(0.04 M Sodium dithionite). No 55-58, (0.27 M $Na_2S_2O_4$). Ceramic R.R., σ_c = 61 mN/m, dp = 0.0095 m, Ref.(26)
59-63	Absorption of O_2 into 0.8 M Na_2SO_3 solutions. Ceramic R.R., σ_c = 61 mN/m , dp = 0.038 m, Ref.(27).
64-69	Absorption of O_2 into 0.5 M Na_2SO_3 solutions. Ceramic R.R., σ_c= 61 mN/m, dp =0.015m, Ref.(28).
70-71	Absorption of O_2 into 10% Na_2SO_3 solutions. Ceramic R.R., σ_c = 61mN/m, dp = 0.025 m, R (29). Corrected values of a_c given in Ref.(28).
72-82	Absorption of CO_2 into NaOH solutions. NaOH concentration No.72-76, 1M. No.77 -82, 2M. Ceramic R.R., σ_c = 61 mN/m , dp = 0.013 m, Ref.(30).
83-91	Absorption of O_2 into 0.05 M $Na_2S_2O_4$ + 0.5 M NaOH solutions. No.83-89 Ceramic R.R., σ_c = 61mN/m, No. 90-91 Polypropylene R.R., σ_c = 27.7 mN/m, dp = 0.025 m, Ref.(31)
92-97	Absorption of O_2 from air into 0.8 M Na_2SO_3 solutions. Pyrex R.R., σ_c = 73 mN/m, dp = 0.010m, Ref.(32).
98-110	Absorption of pure O_2 into 0.5 M. Na_2SO_3 solutions. No 98-101, Ceramic R.R.,σ_c = 61 mN/m. No. 102 - 105, Polypropylene R.R., σ_c = 27.7 mN/m. No.106 - 110 , Polyethyylene R.R.,σ_c = 33 mN/m, dp = 0.015 m, Ref.(33).
111-114	Absorption of O_2 from air into 0.8 M Na_2SO_3 solutions. Silicone coated glass R.R., θ = 93, σ_c = 45.7 mN/m, dp = 0.01 m, Ref.(34).
115-150	Absorption of pure O_2 into 0.5 M. Na_2SO_3 solutions. No. 115-120, Ceramic R.R.,σ_c = 61 mN/m. No.121-122, Polypropylene R.R., σ_c = 27.7 mN/m. No.123-136, Polyethylene R.R., σ_c = 33 mN/m. No.137-150, Hydrophylised Plastic R.R., σ_c = 54 mN/m, dp = 0.015m, Ref.(35).
151-154	Absorption of CO_2 in 1M K_2CO_3 + 1M $KHCO_3$ buffer solutions. Polyethylene R.R., σ_c = 33 mN/m, dp = 0.016 m, Ref.(36).
155-163	Absorption of CO_2 in 1M K_2CO_3 + 1M $KHCO_3$ buffer solutions. No. 155-158, ν = 1.3 mm^2/s. No. 158-163, ν = 1.55 mm^2/s , Glass R.R., σ_c = 73 mN/m, dp = 0.010m, Ref.(37,38).
164-167	Absorption of CO_2 in 1M K_2CO_3 + 1M $KHCO_3$ buffer solutions. Steel R.R., σ_c = 75 mN/m , dp = 0.010m, Ref.(39).

Table - (5.4)

Data bank for volumetric liquid side mass transfer coefficient ($k_L a$).

No.	T	a_t	σ	ρ_L	μ_L	D_L	L	$k_L a$
	^oC	m^2/m^3	mN/m	kg/m^3	mNs/m^2	$\times 10^9$ m^2/s	$kg/m^2 s$	$\times 10^3$ s^{-1}
1	25.0	330	71.3	997.1	0.894	1.970	0.472	2.278
2	25.0	330	71.3	997.1	0.894	1.970	0.694	3.056
3	25.0	330	71.3	997.1	0.894	1.970	1.000	4.444
4	25.0	330	71.3	997.1	0.894	1.970	1.222	5.278
5	25.0	330	71.3	997.1	0.894	1.970	1.444	6.111
6	25.0	330	71.3	997.1	0.894	1.970	1.917	6.944
7	25.0	330	71.3	997.1	0.894	1.970	2.778	9.167
8	25.0	330	71.3	997.1	0.894	1.970	4.167	12.222
9	25.0	330	71.3	997.1	0.894	1.970	8.889	23.889
10	25.0	330	71.3	997.1	0.894	1.970	12.222	26.944
11	25.0	195	71.3	997.1	0.894	1.970	0.667	2.778
12	25.0	195	71.3	997.1	0.894	1.970	3.056	8.889
13	25.0	195	71.3	997.1	0.894	1.970	13.056	26.111
14	25.0	370	71.3	997.1	0.894	1.970	1.498	6.400
15	25.0	370	75.0	1100.0	1.400	1.420	1.600	4.555
16	25.0	370	70.0	1070.0	1.080	1.630	0.770	3.250
17	25.0	370	70.0	1070.0	1.080	1.630	1.551	4.860
18	25.0	370	70.0	1070.0	1.080	1.630	2.311	6.830
19	25.0	370	70.0	1070.0	1.080	1.630	3.103	8.230
20	25.0	370	70.0	1070.0	1.080	1.630	3.873	9.810
21	21.0	130	74.1	1072.0	1.220	1.539	3.153	5.647
22	21.0	130	74.1	1072.0	1.220	1.539	4.407	8.000
23	21.0	130	74.1	1072.0	1.220	1.539	5.015	8.823
24	21.0	130	74.1	1072.0	1.220	1.539	6.465	10.924
25	30.0	330	73.2	1070.0	1.080	1.877	1.263	3.950
26	30.0	330	73.2	1070.0	1.080	1.877	3.122	8.330
27	30.0	330	73.2	1070.0	1.080	1.877	7.741	16.660
28	30.0	330	73.2	1070.0	1.080	1.877	15.596	29.160
29	28.5	367	71.6	996.1	0.827	2.155	0.857	3.600
30	29.1	367	71.6	995.9	0.816	2.188	1.713	6.000
31	29.3	367	71.6	995.9	0.813	2.198	2.719	8.100
32	30.5	367	71.6	995.5	0.791	2.268	3.524	10.100
33	31.0	367	71.6	997.3	0.783	2.295	4.439	12.900
34	31.5	367	71.6	995.2	0.775	2.322	5.444	14.500
35	31.0	367	71.6	995.3	0.783	2.295	7.117	17.400
36	31.3	367	71.6	995.3	0.778	2.311	11.196	24.300
37	31.5	367	71.6	995.2	0.775	2.322	14.778	28.600
38	29.0	190	71.3	996.0	0.818	2.182	4.282	9.400
39	29.3	190	71.3	995.9	0.813	2.198	6.712	12.500
40	29.0	190	71.3	996.0	0.818	2.182	8.017	15.200
41	29.1	190	71.4	995.9	0.816	2.188	10.706	18.400
42	29.0	190	71.3	996.0	0.818	2.182	13.694	23.100
43	29.0	190	71.3	996.0	0.818	2.182	15.736	25.800
44	29.0	367	68.1	995.2	0.842	2.120	0.856	3.500
45	29.5	367	68.1	995.0	0.832	2.147	2.875	8.500

Table – 5.4 (contd.)

No.	T	a_i	σ	ρ_L	μ_L	$D_{L_p} \times 10^9$	L	$k_L a \times 10^3$
	^oC	m^2/m^3	mN/m	kg/m^3	mNs/m^2	m^2/s	kg/m^2s	s^{-1}
46	30.5	367	68.1	994.7	0.814	2.204	5.401	14.700
47	31.0	367	68.1	994.6	0.806	2.230	7.399	17.600
48	31.8	367	68.1	994.4	0.793	2.273	13.673	28.400
49	29.0	367	62.8	993.6	0.860	2.075	0.845	3.400
50	30.2	367	62.8	993.4	0.837	2.140	2.871	9.400
51	30.8	367	62.8	993.2	0.827	2.172	5.403	16.000
52	31.2	367	62.8	993.1	0.820	2.193	6.952	17.700
53	32.0	367	62.8	992.9	0.806	2.228	13.702	31.400
54	30.0	367	59.2	992.2	0.886	2.021	0.833	3.600
55	31.5	367	59.2	992.0	0.858	2.098	2.847	9.900
56	31.5	367	59.2	992.0	0.858	2.098	5.436	14.900
57	32.2	367	59.2	991.8	0.846	2.132	7.408	20.600
58	32.8	367	59.2	991.7	0.835	2.164	14.080	30.900
59	29.5	367	56.0	990.8	0.923	1.937	0.843	4.000
60	30.8	367	56.0	990.5	0.889	2.019	2.863	11.200
61	31.3	367	56.0	990.4	0.888	2.026	5.229	15.300
62	31.8	367	56.0	990.3	0.879	2.050	6.734	20.100
63	32.1	367	56.0	990.2	0.873	2.064	14.111	35.000
64	30.8	367	51.7	988.6	0.959	1.872	0.840	3.800
65	32.2	367	51.7	988.2	0.931	1.937	2.836	10.200
66	32.0	367	51.7	988.3	0.935	1.928	5.416	17.100
67	32.5	367	51.7	988.2	0.925	1.952	6.720	18.700
68	33.0	367	51.7	988.1	0.916	1.975	13.635	29.600
69	32.7	367	46.6	984.0	1.031	1.752	2.804	9.400
70	33.2	367	46.6	984.0	1.020	1.774	5.264	14.900
71	33.5	367	46.6	983.8	1.013	1.788	7.998	19.800
72	34.0	367	46.6	983.7	1.003	1.809	14.952	31.100
73	30.0	367	71.6	995.7	0.800	2.238	0.896	3.600
74	30.0	367	71.6	995.7	0.800	2.238	1.752	6.000
75	30.0	367	71.6	995.7	0.800	2.238	2.688	8.500
76	30.0	367	71.6	995.7	0.800	2.238	4.012	11.100
77	30.0	367	71.6	995.7	0.800	2.238	5.247	13.400
78	30.0	367	71.6	995.7	0.800	2.238	7.318	15.400
79	30.0	367	71.6	995.7	0.800	2.238	9.458	17.200
80	30.0	367	71.6	995.7	0.800	2.238	12.940	21.000
81	25.0	190	71.3	997.0	0.894	1.970	3.848	6.900
82	25.3	190	71.2	997.0	0.894	1.970	5.264	9.100
83	25.0	190	71.3	997.0	0.894	1.970	6.630	11.800
84	25.0	190	71.3	997.0	0.894	1.970	7.936	13.000
85	25.0	190	71.3	997.0	0.894	1.970	10.668	17.200
86	25.0	190	71.3	997.0	0.894	1.970	13.360	20.000
87	25.0	190	71.3	997.0	0.894	1.970	15.850	22.000
88	28.7	367	68.5	995.2	0.855	2.086	0.925	3.500
89	29.0	367	68.5	995.2	0.842	2.120	1.732	6.300
90	29.2	367	68.5	995.1	0.838	2.131	2.666	9.000
91	29.5	367	68.5	995.0	0.832	2.147	4.029	12.900
92	30.0	367	68.5	994.8	0.823	2.175	5.073	14.600
93	30.5	367	68.5	994.7	0.815	2.202	7.062	16.400
94	30.5	367	68.5	994.7	0.815	2.202	10.344	21.300
95	30.8	367	68.5	994.6	0.810	2.216	13.526	23.200
96	29.0	367	62.5	993.6	0.860	2.075	0.864	4.200

Table - 5.4 (contd.)

No.	T	a_t	σ	ρ_L	μ_L	D_{L_p}	L	$k_L a$
	^oC	m^2/m^3	mN/m	kg/m^3	mNs/m^2	$x\ 10^{-2}\ m^2/s$	$kg/m^2 s$	$x\ 10^{-3}\ s^{-1}$
97	29.0	367	62.5	993.6	0.860	2.075	1.709	7.700
98	29.0	367	62.5	993.6	0.860	2.075	4.063	14.400
99	29.0	367	62.5	993.6	0.860	2.075	5.097	15.600
100	29.0	367	62.5	993.6	0.860	2.075	6.955	19.200
101	29.5	367	62.5	993.5	0.851	2.102	9.786	26.400
102	29.5	367	62.5	993.5	0.851	2.102	13.263	32.000
103	28.5	367	57.9	992.7	0.916	1.946	0.913	3.700
104	28.5	367	57.9	992.7	0.916	1.946	1.737	6.000
105	28.8	367	57.9	992.7	0.910	1.960	2.680	8.700
106	29.0	367	57.9	992.6	0.906	1.970	4.020	12.700
107	29.0	367	57.9	992.6	0.906	1.970	5.062	15.100
108	29.5	367	57.9	992.4	0.896	1.996	7.167	18.200
109	29.5	367	57.9	992.4	0.896	1.996	10.373	23.000
110	30.0	367	57.9	992.2	0.896	2.015	13.302	25.600
111	30.5	367	54.2	998.0	0.902	1.989	0.879	3.400
112	30.5	367	54.2	998.0	0.902	1.989	1.729	5.600
113	31.0	367	54.2	987.9	0.893	2.011	2.647	8.500
114	31.0	367	54.2	987.9	0.893	2.011	4.050	12.000
115	31.0	367	54.2	987.9	0.893	2.011	5.038	14.700
116	31.5	367	54.2	987.8	0.884	2.035	7.457	17.400
117	31.5	367	54.2	987.8	0.884	2.035	9.976	20.300
118	32.0	367	54.2	987.7	0.875	2.060	12.938	24.000
119	30.0	367	50.8	989.4	0.922	1.941	0.861	3.900
120	30.0	367	50.8	989.4	0.922	1.941	1.692	6.000
121	30.5	367	50.8	989.2	0.912	1.966	2.651	9.200
122	30.5	367	50.8	989.2	0.912	1.966	4.016	12.900
123	30.5	367	50.8	989.2	0.912	1.966	4.995	16.400
124	31.0	367	50.8	989.1	0.903	1.989	6.973	17.000
125	31.0	367	50.8	989.1	0.903	1.989	9.673	22.300
126	31.5	367	50.8	989.0	0.894	2.014	13.203	26.500
127	29.5	367	49.3	988.3	0.946	1.891	0.860	3.900
128	29.5	367	49.3	988.3	0.946	1.891	1.710	7.000
129	29.5	367	49.3	988.3	0.946	1.891	2.649	9.200
130	29.5	367	49.3	988.3	0.946	1.891	4.022	12.500
131	29.5	367	49.3	988.3	0.946	1.891	5.044	13.800
132	30.0	367	49.3	988.2	0.935	1.915	7.055	19.400
133	30.5	367	49.3	988.0	0.925	1.940	9.732	21.400
134	30.5	367	49.3	988.0	0.925	1.940	13.258	26.900
135	28.5	190	71.6	996.1	0.827	2.155	5.727	9.600
136	28.5	190	71.6	996.1	0.827	2.155	7.172	10.100
137	28.5	190	71.6	996.1	0.827	2.155	8.815	12.800
138	28.5	190	71.6	996.1	0.827	2.155	11.256	15.900
139	25.0	370	75.6	1156.5	1.403	1.478	1.851	4.000
140	25.0	370	75.6	1156.5	1.403	1.478	2.504	5.498
141	25.0	370	75.6	1156.5	1.403	1.478	2.892	6.356
142	25.0	370	75.6	1156.5	1.403	1.478	3.654	7.036
143	25.0	370	75.6	1156.5	1.403	1.478	4.534	8.621
144	25.0	370	75.6	1156.5	1.403	1.478	5.648	9.000
145	25.0	370	75.6	1156.5	1.403	1.478	6.713	10.980
146	25.0	370	75.6	1156.5	1.403	1.478	7.470	11.600
147	25.0	370	76.8	1240.0	2.048	1.162	2.610	3.924

Table - 5.4 (contd.)

No.	T	a_i	σ	ρ_L	μ_L	$D_{L_\rho} \times 10^2$	L	$k_L a \times 10^3$
	^oC	m^2/m^3	mN/m	kg/m^3	mNs/m^2	m^2/s	kg/m^2s	s^{-1}
148	25.0	370	76.8	1240.0	2.048	1.162	3.727	5.233
149	25.0	370	76.8	1240.0	2.048	1.162	4.848	6.000
150	25.0	370	76.8	1240.0	2.048	1.162	6.138	7.445
151	25.0	370	76.8	1240.0	2.048	1.162	7.291	8.000
152	25.0	370	76.8	1240.0	2.048	1.162	8.715	9.074
153	25.0	460	72.0	997.1	0.894	1.970	2.777	5.555
154	25.0	460	72.0	997.1	0.894	1.970	4.372	8.330
155	25.0	460	72.0	997.1	0.894	1.970	6.549	11.110
156	25.0	460	72.0	997.1	0.894	1.970	8.614	13.492
157	25.0	460	72.0	997.1	0.894	1.970	10.791	15.897
158	25.0	460	72.0	997.1	0.894	1.970	13.036	18.370
159	25.0	460	72.0	997.1	0.894	1.970	6.444	14.470
160	25.0	460	72.0	997.1	0.894	1.970	8.527	18.020
161	25.0	460	72.0	997.1	0.894	1.970	10.777	21.750
162	25.0	460	72.0	997.1	0.894	1.970	13.111	24.800
163	25.0	460	72.2	1000.0	0.890	1.960	4.403	11.110
164	25.0	460	72.2	1000.0	0.890	1.960	6.447	14.870
165	25.0	460	72.2	1000.0	0.890	1.960	8.491	18.510
166	25.0	460	72.2	1000.0	0.890	1.960	10.786	22.100
167	25.0	460	72.2	1000.0	0.890	1.960	13.050	25.230
168	25.0	460	71.0	1090.0	2.880	0.710	5.707	7.894
169	25.0	460	71.0	1090.0	2.880	0.710	9.025	10.233
170	25.0	460	71.0	1090.0	2.880	0.710	12.138	14.238
171	25.0	460	69.5	1130.0	5.550	0.500	2.169	2.456
172	25.0	460	69.5	1130.0	5.550	0.500	4.497	3.918
173	25.0	460	69.5	1130.0	5.550	0.500	7.295	5.263
174	25.0	460	69.5	1130.0	5.550	0.500	10.692	6.608
175	25.0	460	69.5	1130.0	5.550	0.500	13.993	9.824
176	25.0	460	68.3	1160.0	10.800	0.320	1.981	1.578
177	25.0	460	68.3	1160.0	10.800	0.320	4.119	2.280
178	25.0	460	68.3	1160.0	10.800	0.320	5.031	2.836
179	25.0	460	68.3	1160.0	10.800	0.320	9.434	3.450
180	25.0	460	68.3	1160.0	10.800	0.320	12.453	4.327
181	25.0	460	68.3	1160.0	10.800	0.320	15.723	5.877
182	25.0	460	68.3	1160.0	10.800	0.320	18.805	7.602
183	25.0	460	67.7	1170.0	16.100	0.270	3.396	1.695
184	25.0	460	67.7	1170.0	16.100	0.270	5.660	1.988
185	25.0	460	67.7	1170.0	16.100	0.270	8.207	2.397
186	25.0	460	67.7	1170.0	16.100	0.270	13.679	4.093
187	25.0	460	67.7	1170.0	16.100	0.270	16.714	4.385
188	25.0	785	71.3	997.1	0.894	1.970	2.631	9.833
189	25.0	785	71.3	997.1	0.894	1.970	6.639	19.944
190	25.0	785	71.3	997.1	0.894	1.970	1.267	5.694
191	25.0	785	71.3	997.1	0.894	1.970	2.319	8.806
192	25.0	785	71.3	997.1	0.894	1.970	1.706	6.944
193	25.0	785	71.3	997.1	0.894	1.970	0.631	3.278
194	25.0	785	71.3	997.1	0.894	1.970	0.856	4.333
195	25.0	785	71.3	997.1	0.894	1.970	4.028	12.972
196	25.0	785	71.3	997.1	0.894	1.970	1.086	4.833
197	25.0	785	71.3	997.1	0.894	1.970	0.775	3.917
198	25.0	785	71.3	997.1	0.894	1.970	0.375	2.292

Table - 5.4 (contd.)

No.	T	a_t	σ	ρ_L	μ_L	D_L	L	$k_L a$
	^oC	m^2/m^3	mN/m	kg/m^3	mNs/m^2	$\times 10^9$ m^2/s	$kg/m^2 s$	$\times 10^3$ s^{-1}
199	25.0	585	71.3	997.1	0.894	1.970	6.083	18.389
200	25.0	585	71.3	997.1	0.894	1.970	1.850	7.556
201	25.0	585	71.3	997.1	0.894	1.970	4.278	13.028
202	25.0	585	71.3	997.1	0.894	1.970	3.472	10.694
203	25.0	585	71.3	997.1	0.894	1.970	6.639	18.583
204	25.0	585	71.3	997.1	0.894	1.970	7.917	21.444
205	25.0	585	71.3	997.1	0.894	1.970	2.778	9.972
206	25.0	585	71.3	997.1	0.894	1.970	1.422	6.833
207	25.0	585	71.3	997.1	0.894	1.970	0.797	4.222
208	25.0	585	71.3	997.1	0.894	1.970	5.667	16.694
209	25.0	585	71.3	997.1	0.894	1.970	0.433	2.581
210	25.0	585	71.3	997.1	0.894	1.970	1.197	5.667
211	25.0	585	71.3	997.1	0.894	1.970	8.472	22.250
212	25.0	585	71.3	997.1	0.894	1.970	9.306	21.556
213	25.0	585	71.3	997.1	0.894	1.970	9.250	21.500
214	25.0	785	71.3	997.1	0.894	4.800	0.633	5.972
215	25.0	785	71.3	997.1	0.894	4.800	6.042	35.139
216	25.0	785	71.3	997.1	0.894	4.800	0.582	5.444
217	25.0	785	71.3	997.1	0.894	4.800	3.472	25.333
218	25.0	785	71.3	997.1	0.894	4.800	2.767	18.417
219	25.0	785	71.3	997.1	0.894	4.800	1.647	11.917
220	25.0	785	71.3	997.1	0.894	4.800	4.111	26.472
221	25.0	785	71.3	997.1	0.894	4.800	1.294	10.444
222	25.0	785	71.3	997.1	0.894	4.800	5.472	29.667
223	25.0	785	71.3	997.1	0.894	4.800	6.819	36.389
224	25.0	785	71.3	997.1	0.894	4.800	1.093	10.389
225	25.0	785	71.3	997.1	0.894	4.800	5.250	30.778
226	25.0	785	71.3	997.1	0.894	4.800	0.694	6.389
227	25.0	785	71.3	997.1	0.894	4.800	1.064	9.556
228	25.0	785	71.3	997.1	0.894	1.970	3.958	16.111
229	25.0	785	71.3	997.1	0.894	1.970	1.057	6.028
230	25.0	785	71.3	997.1	0.894	1.970	4.556	16.694
231	25.0	785	71.3	997.1	0.894	1.970	2.369	10.861
232	25.0	785	71.3	997.1	0.894	1.970	0.611	3.694
233	25.0	785	71.3	997.1	0.894	1.970	9.278	27.556
234	25.0	785	71.3	997.1	0.894	1.970	3.572	14.389
235	25.0	785	71.3	997.1	0.894	1.970	1.183	6.583

Relevant details regarding Table - 5.4 :

Data No.	System and Packing Characteristics.
1-13	Absorption of pure CO_2 into water. Ceramic R.R., σ_c = 61 mN/m, No. 1-10, dp = 0.015 m, No. 11-13, dp = 0.025 m, Ref.(40).
14-15	Absorption of pure CO_2 into water and 1.05 M Na_2SO_4 solutions respectively.. Ceramic R.R., σ_c = 61 mN/m, dp = 0.013 m, Ref.(19).

Table - 5.4 (contd.)

16-20	Absorption of pure CO_2 into 1.78 M Nacl solution. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.013 m, Ref.(21).
21-24	Absorption of pure CO_2 into 0.53 M Na_2SO_4 solution. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.038 m, Ref.(22).
25-28	Absorption of pure O_2 into aqueous Na_2SO_3 solution. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.015 m, Ref.(28).
29-43	Absorption of pure CO_2 into water. Ceramic R.R., σ_c = 61 mN/m, No. 29-37, d_p = 0.013 m, No. 38-43, d_p = 0.025 m, Ref.(41).
44-72	Absorption of pure CO_2 into isopropanaol-water solutions. (isopropanol concentration in vol % :- No.44-48,0.5, No.49-53,1.5, No. 54-58,2.5, No.59-63,3.5, No.64-68,5, No. 69-72, 8.) Ceramic R.R., σ_c = 61 mN/m, d_p = 0.013 m, Ref.(41).
73-87	Absorption of pure CO_2 into water. PVC R.R., σ_c = 40 mN/m, No 73-80, d_p = 0.013 m, No.81-87, d_p = 0.025 m, Ref.(41).
88-134	Absorption of pure CO_2 into isopropanaol-water solutions. (isopropanol concentration in vol % :- No.88-95,0.5, No.96-102,1.5, No.103-110,2.5, No.111-118,3.5, No.119-126,4.5, No. 127-134, 5.5.). PVC R.R., σ_c = 40 mN/m, d_p = 0.013 m, Ref.(41).
135-138	Absorption of pure CO_2 into water. PP R.R., σ_c = 27.7 mN/m, d_p = 0.025 m, Ref.(41).
139-152	Absorption of pure CO_2 into $NaNO_3$ + Sugar solutions. ($NaNO_3$ & Sugar conc in gm/1000gm water as follows : No.139-146, 272,92, No. 147-152, 405,169.) Ceramic R.R., σ_c = 61 mN/m, d_p = 0.013 m, Ref.(42).
153-162	Absorption of pure CO_2 into water. No.153-158, PTFE R.R., σ_c = 18.0 mN/m, PP R.R., No.159-162, Glass R.R., σ_c = 73.0 mN/m, d_p = 0.010 m, Ref.(43).
163-187	Absorption of pure CO_2 into pure water and aqueous glycerol mixtures. (Glycerol composition in wt % as follows :- No.163-167, 0, No.168-170, 37, No.171-175, 52, No.176-182, 63, No. 183-187, 68.) Glass R.R., σ_c = 73.0 mN/m, d_p = 0.010 m, Ref.(44).
188-213	Absorption of pure CO_2 into water. Ceramic R.R., σ_c = 61 mN/m, No. 188-198, d_p = 0.006 m, No. 199-213, d_p = 0.008 m, Ref.(45).
214-227	Absorption of H_2 into water. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.006 m, Ref.(46).
228-235	Absorption of pure CO_2 into water. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.006 m, Ref.(46).

Table - (5.5 A)

Data bank for gas side mass transfer coefficient during physical absorption. :

Case I - Overall gas side mass transfer coefficient ($K_G a$).

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	μ_G x 10^2 mNs/m^2	D_G x 10^5 m^2/s	L ---kg/m^2s---	G	$K_G a$ x 10^2 $kmol/m^3sa$
1	26.6	26.6	190	1.1780	1.8390	2.3299	0.679	0.244	2.767
2	26.6	26.6	190	1.1780	1.8390	2.3299	1.348	0.258	4.049
3	26.6	26.6	190	1.1780	1.8390	2.3299	2.712	0.248	4.760
4	26.6	26.6	190	1.1780	1.8390	2.3299	0.681	0.537	3.915
5	26.6	26.6	190	1.1780	1.8390	2.3299	1.330	0.537	6.585
6	26.6	26.6	190	1.1780	1.8390	2.3299	2.740	0.553	7.652
7	26.6	26.6	190	1.1780	1.8390	2.3299	0.681	0.663	4.983
8	26.6	26.6	190	1.1780	1.8390	2.3299	0.681	0.825	5.695
9	26.6	26.6	190	1.1780	1.8390	2.3299	0.681	0.797	5.428
10	26.6	26.6	190	1.1780	1.8390	2.3299	2.712	0.766	11.478
11	26.6	26.6	190	1.1780	1.8390	2.3299	4.096	0.716	11.256
12	26.6	26.6	190	1.1780	1.8390	1.2826	0.681	0.118	0.943
13	26.6	26.6	190	1.1780	1.8390	1.2826	1.339	0.129	1.522
14	26.6	26.6	190	1.1780	1.8390	1.2826	0.681	0.245	1.428
15	26.6	26.6	190	1.1780	1.8390	1.2826	1.339	0.239	2.416
16	26.6	26.6	190	1.1780	1.8390	1.2826	2.712	0.262	3.123
17	26.6	26.6	190	1.1780	1.8390	1.2826	4.096	0.250	4.342
18	26.6	26.6	190	1.1780	1.8390	1.2826	0.678	0.564	2.033
19	26.6	26.6	190	1.1780	1.8390	1.2826	1.339	0.505	3.261
20	26.6	26.6	190	1.1780	1.8390	1.2826	2.712	0.561	4.760
21	26.6	26.6	190	1.1780	1.8390	1.5591	0.681	0.144	1.659
22	26.6	26.6	190	1.1780	1.8390	1.5591	1.347	0.138	2.776
23	26.6	26.6	190	1.1780	1.8390	1.5591	2.712	0.136	2.861
24	26.6	26.6	190	1.1780	1.8390	1.5591	0.681	0.254	2.171
25	26.6	26.6	190	1.1780	1.8390	1.5591	1.339	0.247	4.133
26	26.6	26.6	190	1.1780	1.8390	1.5591	2.712	0.254	5.294
27	26.6	26.6	190	1.1780	1.8390	1.5591	4.096	0.237	5.339
28	26.6	26.6	190	1.1780	1.8390	1.5591	0.681	0.559	3.688
29	26.6	26.6	190	1.1780	1.8390	1.5591	1.356	0.555	6.229
30	26.6	26.6	190	1.1780	1.8390	1.5591	2.712	0.557	9.343
31	26.6	26.6	190	1.1780	1.8390	1.5591	4.096	0.582	11.123
32	26.6	26.6	190	1.1780	1.8390	1.5591	0.681	0.803	5.250
33	26.6	26.6	190	1.1780	1.8390	1.5591	1.339	0.734	8.898
34	26.6	26.6	190	1.1780	1.8390	1.5591	2.712	0.814	12.502
35	26.6	26.6	190	1.1780	1.8390	1.5591	4.096	0.698	12.991
36	26.6	26.6	190	1.1780	1.8390	1.5591	0.681	1.192	8.097
37	26.6	26.6	190	1.1780	1.8390	1.5591	1.339	1.287	13.347
38	26.6	26.6	190	1.1780	1.8390	1.5591	2.712	1.279	18.686
39	26.6	26.6	190	1.1780	1.8390	1.2002	0.677	0.140	1.504
40	26.6	26.6	190	1.1780	1.8390	1.2002	1.348	0.140	2.202
41	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.141	3.212
42	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.138	3.604
43	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.141	3.359
44	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.140	4.138

Table - 5.5 A (contd.)

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	μ_G x 10^2 mNs/m^2	D_G x 10^5 m^2/s	L ---kg/m^2s---	G	K_Ga x 10^2 $kmol/m^3sa$
45	26.6	26.6	190	1.1780	1.8390	1.2002	0.678	0.244	2.002
46	26.6	26.6	190	1.1780	1.8390	1.2002	1.348	0.245	3.648
47	26.6	26.6	190	1.1780	1.8390	1.2002	1.316	0.237	3.484
48	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.245	4.493
49	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.244	4.716
50	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.245	4.938
51	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.243	5.917
52	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.247	6.585
53	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.243	5.294
54	26.6	26.6	190	1.1780	1.8390	1.2002	0.681	0.540	2.999
55	26.6	26.6	190	1.1780	1.8390	1.2002	0.681	0.532	2.847
56	26.6	26.6	190	1.1780	1.8390	1.2002	1.348	0.534	5.428
57	26.6	26.6	190	1.1780	1.8390	1.2002	1.348	0.541	5.784
58	26.6	26.6	190	1.1780	1.8390	1.2002	1.339	0.532	4.627
59	26.6	26.6	190	1.1780	1.8390	1.2002	1.348	0.529	5.428
60	26.6	26.6	190	1.1780	1.8390	1.2002	1.339	0.530	4.760
61	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.529	6.851
62	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.538	7.830
63	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.540	7.074
64	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.537	7.118
65	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.529	8.542
66	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.540	8.987
67	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.533	10.144
68	26.6	26.6	190	1.1780	1.8390	1.2002	0.681	0.765	4.160
69	26.6	26.6	190	1.1780	1.8390	1.2002	0.681	0.758	4.493
70	26.6	26.6	190	1.1780	1.8390	1.2002	1.339	0.765	6.985
71	26.6	26.6	190	1.1780	1.8390	1.2002	1.339	0.753	7.163
72	26.6	26.6	190	1.1780	1.8390	1.2002	1.282	0.758	6.585
73	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.765	9.387
74	26.6	26.6	190	1.1780	1.8390	1.2002	2.712	0.759	9.387
75	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.777	11.745
76	26.6	26.6	190	1.1780	1.8390	1.2002	4.096	0.765	14.059
77	26.6	26.6	190	1.1780	1.8390	1.2002	0.681	1.164	6.807
78	26.6	26.6	190	1.1780	1.8390	1.2002	1.339	1.154	10.233
79	20.0	30.0	370	1.1648	1.8560	1.3082	3.960	0.283	4.671
80	20.0	30.8	370	1.1617	1.8600	1.3142	3.960	0.426	5.739
81	19.7	30.2	370	1.1640	1.8570	1.3097	3.960	0.499	5.899
82	19.2	29.7	370	1.1660	1.8560	1.3059	3.960	0.679	7.875
83	19.7	28.6	370	1.1702	1.8490	1.2976	3.960	0.793	8.765
84	20.3	29.4	370	1.1671	1.8530	1.3036	3.960	0.261	4.547
85	20.6	31.6	370	1.1587	1.8620	1.3203	3.940	0.407	6.318
86	20.5	32.0	370	1.1574	1.8650	1.3229	3.940	0.530	7.697
87	20.2	28.9	370	1.1691	1.8510	1.2997	3.940	0.656	8.297
88	21.1	28.6	370	1.1702	1.8500	1.2976	3.940	0.799	9.031
89	21.4	29.1	370	1.1683	1.8520	1.3014	3.987	0.400	5.695
90	21.6	31.1	370	1.1605	1.8610	1.3166	3.987	0.542	7.541
91	20.6	31.1	370	1.1605	1.8610	1.3166	3.987	0.667	8.231
92	21.1	31.6	370	1.1587	1.8640	1.3203	3.987	0.770	8.942

Table - 5.5 A (contd.)

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	$\mu_G \times 10^2$ mNs/m^2	$D_G \times 10^5$ m^2/s	L ---kg/m^2s---	G	$K_Ga \times 10^2$ $kmol/m^3sa$
93	21.4	29.7	370	1.1660	1.8540	1.3059	1.397	0.420	3.857
94	16.1	29.7	370	1.1659	1.8540	1.5876	3.255	0.412	9.298
95	16.1	32.0	370	1.1574	1.8660	1.6082	2.102	0.412	7.497
96	16.1	29.5	370	1.1667	1.8540	1.5856	4.489	0.279	7.029
97	17.2	32.8	370	1.1542	1.8690	1.6157	4.123	0.557	10.010
98	18.3	34.5	370	1.1478	1.8770	1.6318	4.123	0.659	11.478
99	18.6	32.2	370	1.1564	1.8660	1.6105	4.421	0.797	13.258
100	16.9	32.8	370	1.1542	1.8690	1.6157	5.574	0.411	9.610
101	17.5	33.0	370	1.1534	1.8700	1.6179	2.929	0.414	7.808
102	19.2	28.9	370	1.1691	1.8510	1.5799	3.499	0.255	6.206
103	23.8	28.9	370	1.1691	1.8510	1.5799	1.207	0.412	5.294
104	25.5	31.6	370	1.1587	1.8630	1.6049	1.031	0.412	4.783
105	25.5	31.6	370	1.1587	1.8630	1.6049	0.746	0.412	3.604
106	23.3	28.9	370	2.2789	1.8506	0.8105	3.974	0.509	5.057
107	22.2	28.9	370	2.2789	1.8506	0.8105	3.974	0.788	7.163
108	22.0	28.9	370	2.2789	1.8506	0.8105	3.580	0.513	5.561
109	26.4	28.3	370	2.2831	1.8480	0.8080	3.852	0.717	6.251
110	27.0	29.4	370	4.5656	1.8533	0.4051	3.580	0.692	2.767
111	26.1	29.7	370	4.5613	1.8546	0.4058	3.580	0.313	1.869
112	26.4	32.2	370	4.5240	1.8666	0.4117	3.987	0.380	2.202
113	26.6	28.6	370	4.5781	1.8493	0.4032	3.987	0.759	3.559
114	26.4	29.7	370	4.5613	1.8546	0.4058	3.987	1.112	4.582
115	27.5	29.7	370	4.5613	1.8546	0.4058	3.987	1.214	4.796
116	28.0	33.6	370	7.6600	1.8733	0.2440	3.987	0.636	1.851
117	28.0	33.6	370	7.6600	1.8733	0.2440	3.987	1.058	2.607
118	27.5	33.0	370	7.6740	1.8706	0.2432	3.987	1.492	3.399
119	28.8	33.0	370	7.6740	1.8706	0.2432	3.987	1.847	4.271
120	30.0	28.3	370	12.5682	1.8480	0.1468	3.987	0.932	2.184
121	30.0	33.3	370	12.3631	1.8720	0.1511	3.987	0.434	1.317
122	30.8	33.6	370	12.3518	1.8733	0.1513	3.987	0.570	1.428
123	31.6	31.1	370	12.4533	1.8613	0.1491	3.987	1.164	2.122
124	29.4	30.8	370	12.4648	1.8598	0.1489	3.987	1.682	2.714
125	26.6	27.7	370	1.1737	1.8450	1.2908	1.111	0.459	2.803
126	26.6	28.0	370	1.1725	1.8470	1.2931	1.326	0.459	3.181
127	26.1	27.7	370	1.1737	1.8450	1.2908	1.565	0.459	3.608
128	26.6	29.1	370	1.1683	1.8520	1.3014	1.086	0.545	2.825
129	27.2	29.1	370	1.1683	1.8520	1.3014	1.326	0.545	3.426
130	27.2	29.1	370	1.1683	1.8520	1.3014	1.555	0.545	3.782
131	28.6	30.0	370	1.1648	1.8560	1.3082	1.086	0.569	2.941
132	29.7	30.0	370	1.1648	1.8560	1.3082	1.326	0.569	3.581
133	29.7	30.8	370	1.1617	1.8600	1.3142	1.555	0.569	3.902
134	31.1	31.9	370	1.1574	1.8650	1.3229	1.118	0.401	2.291
135	31.1	32.5	370	1.1553	1.8680	1.3271	1.326	0.401	2.838
136	30.5	31.9	370	1.1574	1.8650	1.3229	1.555	0.401	3.403
137	26.1	27.2	370	1.1756	1.8420	1.2872	1.111	0.700	2.914
138	26.6	27.5	370	1.1745	1.8440	1.2893	1.326	0.700	3.786
139	27.2	27.2	370	1.1756	1.8420	1.2872	1.575	0.700	4.169

Table - 5.5 A (contd.)

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	$\mu_G \times 10^2$ mNs/m^2	$D_G \times 10^5$ m^2/s	L ---kg/m^2s---	G	$K_G a \times 10^2$ $kmol/m^3 sa$
140	30.5	30.8	243	1.1617	1.8600	1.3142	1.257	0.380	2.536
141	30.5	30.8	243	1.1617	1.8600	1.3142	1.440	0.380	2.634
142	30.5	30.8	243	1.1617	1.8600	1.3142	1.440	0.444	2.781
143	31.1	32.7	243	1.1545	1.8690	1.3286	1.440	0.503	2.830
144	31.1	31.4	243	1.1594	1.8620	1.3188	1.440	0.378	2.776
145	30.0	32.2	243	1.1564	1.8660	1.3248	1.208	0.584	2.678
146	30.5	32.5	243	1.1553	1.8680	1.3271	1.440	0.584	3.048
147	31.4	31.1	243	1.1606	1.8610	1.3165	1.440	0.413	2.607
148	30.0	30.5	243	1.1629	1.8570	1.3120	1.208	0.387	2.322
149	30.5	30.8	243	1.1617	1.8600	1.3142	1.452	0.387	2.741
150	27.7	28.9	148	1.1691	1.8510	1.2997	1.462	0.308	2.033
151	26.1	23.9	148	1.1888	1.8260	1.2623	1.240	0.276	1.833
152	24.7	23.6	148	1.1899	1.8250	1.2603	1.450	0.276	2.064
153	23.9	23.6	148	1.1899	1.8250	1.2602	1.045	0.350	1.855
154	23.3	22.8	148	1.1933	1.8210	1.2540	1.262	0.350	2.051
155	23.6	21.7	148	1.1978	1.8160	1.2458	1.465	0.350	2.394
156	23.8	23.6	148	1.1899	1.8250	1.2602	1.057	0.393	1.993
157	25.0	22.8	148	1.1933	1.8210	1.2540	1.230	0.425	2.176
158	24.4	22.8	148	1.1933	1.8210	1.2540	0.659	0.425	1.490
159	23.9	22.5	148	1.1944	1.8200	1.2520	0.828	0.425	1.771
160	28.3	25.5	148	1.1822	1.8340	1.2747	1.235	0.284	1.815
161	27.8	25.0	148	1.1843	1.8320	1.2706	1.477	0.284	2.024
162	26.6	29.4	190	1.1670	1.8530	2.3686	0.678	0.678	4.004
163	26.6	29.4	190	1.1670	1.8530	2.3686	0.678	0.678	4.538
164	26.6	29.4	190	1.1670	1.8530	2.3686	0.678	0.194	2.211
165	26.6	29.4	190	1.1670	1.8530	2.3686	0.678	0.467	3.630
166	26.6	29.4	190	1.1670	1.8530	2.3686	0.678	0.706	4.255
167	26.6	29.4	190	1.1670	1.8530	2.3686	0.678	1.126	5.570
168	26.6	29.4	190	1.1670	1.8530	2.3686	0.542	0.678	3.928
169	26.6	29.4	190	1.1670	1.8530	2.3686	0.659	0.678	4.138
170	26.6	29.4	190	1.1670	1.8530	2.3686	0.814	0.678	4.569
171	26.6	29.4	190	1.1670	1.8530	2.3686	1.085	0.678	5.570
172	26.6	29.4	190	1.1670	1.8530	2.3686	1.423	0.678	6.077
173	29.0	29.0	190	1.1687	1.8510	2.3626	4.069	0.698	10.273
174	29.5	29.5	190	1.1667	1.8530	2.3695	2.848	0.705	7.692
175	29.5	29.5	190	1.1667	1.8530	2.3695	4.069	0.549	8.333
176	8.0	8.0	130	1.2644	1.7460	1.7800	6.078	1.351	16.550
177	11.5	11.5	130	1.2500	1.7600	1.8230	2.026	1.351	9.254
178	6.0	6.0	130	1.2724	1.7370	1.7590	6.078	0.473	7.074
179	8.0	8.0	130	1.2600	1.7440	1.7760	6.078	0.810	10.099
180	5.5	5.5	130	1.2740	1.7350	1.7530	6.093	0.270	4.849
181	5.5	5.5	95	1.2740	1.7340	1.7530	6.078	0.810	8.520
182	6.0	6.0	95	1.2720	1.7360	1.7590	6.078	1.350	11.923
183	8.0	8.0	95	1.2644	1.7450	1.7820	2.026	0.810	4.849

Table - 5.5 A (contd.)

Relevant details regarding Table - 5.5 A :

Data No.	System and Packing characteristics.
1-11	Absorption of Ammonia from air into water. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(47).
12-20	Absorption of Acetone from air into water. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(47).
21-38	Absorption of Methanol from air into water. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(47).
39-78	Absorption of Ethanol from air into water. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(47).
79-93	Absorption of Acetone from air into water. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.013 m, Ref.(48).
94-124	Absorption of Methanol from air into water. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.013 m, Pressure variations as follows :- No. 94-105, P = 1atm a, No.106-109, P = 1.95 atm a, No110-115, P = 3.9 atm a, No.116-119, P = 6.7 atm a, No.120-124, P = 10.7 atm a, Ref.(48).
125-161	Absorption of Acetone from air into water. Ceramic R.R., σ_c = 61 mN/m, No.125-139, d_p = 0.013 m, No.140-149, d_p = 0.019 m, No.150-161, d_p = 0.0317 m, Ref.(49).
162-172	Absorption of Ammonia from air into water. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(50).
173-175	Absorption of Ammonia from air into water. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, Ref.(51).
176-183	Absorption of Ammonia from air into water. Ceramic R.R., σ_c = 61 mN/m, No.176-180,d_p = 0.048 m, No.181-183, d_p = 0.05 m, Ref.(52).

Table - (5.5 B)

Data bank for gas side mass transfer coefficients during physical absorption :

Case II - Volumetric gas side mass transfer coefficient ($k_G a$).

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	μ_G x 10^2 mNs/m^2	D_G x 10^5 m^2/s	L ---kg/m^2s---	G	$k_G a$ x 10^2 $kmol/m^3sa$
1	30.0	30.0	190	1.165	1.856	1.3982	1.398	0.311	4.470
2	30.0	30.0	190	1.165	1.856	1.3982	2.732	0.304	6.330
3	30.0	30.0	190	1.165	1.856	1.3701	5.929	0.493	12.150
4	30.0	30.0	190	1.165	1.856	1.3650	2.732	0.602	10.200
5	30.0	30.0	190	1.165	1.856	1.3187	2.742	0.935	12.450
6	30.0	30.0	190	1.165	1.856	1.4350	1.561	0.179	3.000
7	30.0	30.0	190	1.165	1.856	1.4350	5.474	0.179	5.200
8	30.0	30.0	190	1.165	1.856	1.4350	8.401	0.179	7.000
9	30.0	30.0	190	1.165	1.856	1.4350	12.498	0.179	7.500
10	30.0	30.0	190	1.165	1.856	1.4350	1.561	0.252	4.000
11	30.0	30.0	190	1.165	1.856	1.4350	3.057	0.252	5.100
12	30.0	30.0	190	1.165	1.856	1.4350	5.474	0.252	6.700
13	30.0	30.0	190	1.165	1.856	1.4350	8.401	0.252	8.300
14	30.0	30.0	190	1.165	1.856	1.4350	10.265	0.252	8.900
15	30.0	30.0	190	1.165	1.856	1.4350	12.498	0.252	9.000
16	30.0	30.0	190	1.165	1.856	1.4350	1.561	0.360	4.900
17	30.0	30.0	190	1.165	1.856	1.4350	5.474	0.360	7.800
18	30.0	30.0	190	1.165	1.856	1.4350	8.401	0.360	9.200
19	30.0	30.0	190	1.165	1.856	1.4350	12.498	0.360	10.400
20	30.0	30.0	190	1.165	1.856	1.4350	1.593	0.175	3.100
21	30.0	30.0	190	1.165	1.856	1.4350	3.154	0.175	3.800
22	30.0	30.0	190	1.165	1.856	1.4350	4.639	0.175	4.300
23	30.0	30.0	190	1.165	1.856	1.4350	5.691	0.175	5.100
24	30.0	30.0	190	1.165	1.856	1.4350	1.257	0.349	4.500
25	30.0	30.0	190	1.165	1.856	1.4350	3.209	0.349	5.900
26	30.0	30.0	190	1.165	1.856	1.4350	4.824	0.349	7.000
27	30.0	30.0	190	1.165	1.856	1.4350	5.940	0.349	8.000
28	30.0	30.0	190	1.165	1.856	1.4350	1.507	0.524	6.300
29	30.0	30.0	190	1.165	1.856	1.4350	2.786	0.524	7.300
30	30.0	30.0	190	1.165	1.856	1.4350	4.466	0.524	9.000
31	30.0	30.0	190	1.165	1.856	1.4350	5.940	0.524	10.300
32	30.0	30.0	190	1.165	1.856	1.4350	1.453	0.757	7.400
33	30.0	30.0	190	1.165	1.856	1.4350	3.187	0.757	9.200
34	30.0	30.0	190	1.165	1.856	1.4350	4.466	0.757	12.300
35	30.0	30.0	190	1.165	1.856	1.4350	6.807	0.757	14.100
36	30.0	30.0	190	1.165	1.856	1.4350	1.398	0.990	10.200
37	30.0	30.0	190	1.165	1.856	1.4350	3.306	0.990	13.900
38	30.0	30.0	190	1.165	1.856	1.4350	4.412	0.990	16.200
39	30.0	30.0	190	1.165	1.856	1.4350	6.254	0.990	18.600
40	28.0	28.0	190	1.173	1.846	1.4185	1.957	0.176	3.500

Table - 5.5 B (contd.)

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	μ_G x 10^2 mNs/m^2	D_G x 10^5 m^2/s	L ---kg/m^2s---	G	$k_G a$ x 10^2 kmol/m^3sa
41	28.0	28.0	190	1.173	1.846	1.4185	3.348	0.176	4.100
42	28.0	28.0	190	1.173	1.846	1.4185	4.978	0.176	5.000
43	28.0	28.0	190	1.173	1.846	1.4185	6.152	0.176	5.400
44	28.0	28.0	190	1.173	1.846	1.4185	1.620	0.293	4.200
45	28.0	28.0	190	1.173	1.846	1.4185	3.457	0.293	5.800
46	28.0	28.0	190	1.173	1.846	1.4185	4.478	0.293	5.800
47	28.0	28.0	190	1.173	1.846	1.4185	6.370	0.293	7.000
48	28.0	28.0	190	1.173	1.846	1.4185	2.120	0.469	5.600
49	28.0	28.0	190	1.173	1.846	1.4185	3.457	0.469	7.200
50	28.0	28.0	190	1.173	1.846	1.4185	5.261	0.469	7.500
51	28.0	28.0	190	1.173	1.846	1.4185	6.272	0.469	8.900
52	30.0	30.0	190	1.165	1.856	1.5150	1.593	0.175	2.800
53	30.0	30.0	190	1.165	1.856	1.5150	2.938	0.175	3.500
54	30.0	30.0	190	1.165	1.856	1.5150	4.466	0.175	4.300
55	30.0	30.0	190	1.165	1.856	1.5150	5.582	0.175	5.000
56	30.0	30.0	190	1.165	1.856	1.5150	1.485	0.349	4.500
57	30.0	30.0	190	1.165	1.856	1.5150	2.872	0.349	5.400
58	30.0	30.0	190	1.165	1.856	1.5150	3.816	0.349	6.200
59	30.0	30.0	190	1.165	1.856	1.5150	5.582	0.349	7.300

Relevant details regarding Table - 5.5 B :

Data No.	System and Packing characteristics.
1-5	Absorption of SO_2 from air into 2 M NaOH. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, Ref.(24,53).
6-51	Absorption of Cl_2 from air into 2 M NaOH. No.6-19, Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, No.20-39, PVC. R.R., σ_c = 40 mN/m, d_p = 0.025 m, No.40-51, Polypropylene. R.R., σ_c = 27.7 mN/m, d_p = 0.025 m, Ref.(41).
52-59	Absorption of SO_2 from air into 2 M NaOH. PVC. R.R., σ_c = 40 mN/m, d_p = 0.025 m, Ref.(41).

Table - (5.5 C)

Data bank for gas side mass transfer coefficients during physical absorption : Case III - Volumetric gas side mass transfer coefficient during Vaporization ($k_G a$)

No.	T_L °C	T_G °C	a_t m^2/m^3	ρ_G kg/m^3	μ_G $\times 10^2$ mNs/m^2	D_G $\times 10^5$ m^2/s	L ---kg/m^2s---	G	$k_G a$ $\times 10^2$ kmol/m^3sa
1	17.7	25.5	190	1.182	1.834	0.9002	2.170	0.206	7.741
2	14.7	25.0	190	1.184	1.834	0.8976	2.170	0.237	9.298
3	13.7	24.0	190	1.188	1.827	0.8923	2.170	0.267	9.031
4	13.0	22.5	190	1.194	1.820	0.8845	2.170	0.293	9.387
5	12.6	23.0	190	1.192	1.822	0.8871	2.170	0.339	10.678
6	12.9	23.0	190	1.192	1.822	0.8871	2.170	0.388	11.923
7	12.6	24.0	190	1.188	1.827	0.8923	2.170	0.433	13.480
8	12.2	23.0	190	1.192	1.822	0.8871	2.170	0.456	12.991
9	12.5	23.0	190	1.192	1.822	0.8871	2.170	0.495	14.103
10	11.7	23.5	190	1.190	1.825	0.8897	2.170	0.515	14.548
11	12.2	23.5	190	1.190	1.825	0.8897	2.170	0.545	14.415
12	11.5	22.5	190	1.194	1.820	0.8845	2.170	0.583	13.925
13	11.5	22.3	190	1.195	1.819	0.8832	2.170	0.597	14.993
14	11.5	23.3	190	1.191	1.824	0.8884	2.170	0.627	16.105
15	10.9	23.0	190	1.192	1.822	0.8871	2.170	0.671	18.107
16	22.9	26.5	190	1.178	1.839	0.6809	2.170	0.212	6.896
17	22.7	25.5	190	1.182	1.834	0.6769	2.170	0.231	7.830
18	22.6	25.5	190	1.182	1.834	0.6769	2.170	0.282	8.142
19	22.5	25.5	190	1.182	1.834	0.6769	2.170	0.313	9.165
20	22.1	25.0	190	1.184	1.832	0.6750	2.170	0.355	9.832
21	21.8	25.0	190	1.184	1.832	0.6750	2.170	0.388	10.945
22	21.5	24.0	190	1.188	1.827	0.6710	2.170	0.420	11.034
23	21.3	24.0	190	1.188	1.827	0.6710	2.170	0.445	11.745
24	21.5	24.0	190	1.188	1.827	0.6710	2.170	0.472	13.258
25	21.0	24.5	190	1.186	1.829	0.6730	2.170	0.498	12.413
26	22.3	24.5	190	1.186	1.829	0.6730	2.170	0.509	12.101
27	22.1	24.0	190	1.188	1.827	0.6710	2.170	0.553	12.813
28	21.5	24.0	190	1.188	1.827	0.6710	2.170	0.595	14.548
29	21.2	24.5	190	1.186	1.829	0.6730	2.170	0.632	14.815
30	21.5	24.0	190	1.188	1.827	0.6710	2.170	0.662	14.415
31	17.7	20.3	190	1.203	1.809	2.4935	1.404	0.273	8.142
32	18.1	23.0	190	1.192	1.822	2.5345	2.441	0.271	11.478
33	17.6	21.3	190	1.199	1.814	2.5084	2.712	0.274	10.411
34	18.3	22.0	190	1.196	1.817	2.5196	2.767	0.271	10.767
35	17.9	22.0	190	1.196	1.817	2.5196	3.065	0.270	8.275
36	19.6	22.0	190	1.196	1.817	2.5196	0.925	0.273	7.608
37	19.3	22.3	190	1.195	1.819	2.5233	1.434	0.275	9.165
38	19.4	22.5	190	1.194	1.820	2.5270	1.461	0.274	9.432
39	19.5	23.0	190	1.192	1.822	2.5345	2.068	0.270	11.567
40	19.8	23.0	190	1.192	1.822	2.5345	2.957	0.274	10.233

Table - 5.5 C (contd.)

No.	T_L	T_G	a_t	ρ_G	μ_G	D_G	L	G	$k_G a$
	^oC	^oC	m^2/m^3	kg/m^3	$\times 10^2$ mNs/m^2	$\times 10^5$ m^2/s	---kg/m^2s---		$\times 10^2$ $kmol/m^3sa$
41	20.9	22.8	190	1.193	1.821	2.5308	0.590	0.271	7.875
42	21.2	23.0	190	1.192	1.822	2.5345	0.983	0.271	8.587
43	20.6	23.5	190	1.190	1.825	2.5420	1.600	0.271	9.743
44	20.7	23.5	190	1.190	1.825	2.5420	1.844	0.271	9.788
45	19.4	22.5	190	1.194	1.820	2.5270	2.360	0.271	10.989
46	21.2	31.5	190	1.159	1.863	2.6633	1.600	0.271	9.743
47	21.3	31.0	190	1.161	1.861	2.6556	2.068	0.271	10.010
48	22.6	23.5	190	1.190	1.824	2.5420	2.170	0.194	7.430
49	22.7	25.3	190	1.183	1.833	2.5683	2.170	0.209	8.275
50	18.6	24.8	190	1.185	1.831	2.5608	2.170	0.315	10.856
51	18.0	22.5	190	1.194	1.820	2.5270	2.170	0.373	13.036
52	20.8	27.5	190	1.174	1.844	2.6024	2.170	0.399	13.347
53	20.2	26.0	190	1.180	1.837	2.5797	2.170	0.408	12.457
54	19.1	24.8	190	1.185	1.831	2.5608	2.170	0.441	14.148
55	19.1	25.0	190	1.184	1.832	2.5646	2.170	0.472	14.459
56	17.5	22.0	190	1.196	1.818	2.5196	2.170	0.502	17.485
57	17.0	21.8	190	1.197	1.816	2.5158	2.170	0.570	16.283
58	17.1	25.3	190	1.183	1.833	2.5683	2.170	0.604	16.951
59	16.5	21.5	190	1.198	1.825	2.5121	2.170	0.631	18.330
60	17.0	25.0	190	1.184	1.832	2.5646	2.170	0.646	17.885

Relevant details regarding Table - 5.5 C :

Data No.	System and Packing characteristics.
1-15	Vaporization of Benzene into air. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(54).
16-30	Vaporization of Ethyl n-butyrate into air. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(54).
31-60	Vaporization of Water into air. Carbon R.R., σ_c = 56 mN/m, d_p = 0.025 m, Ref.(54).

Table - (5.5 D)

Data bank for gas side mass transfer coefficients during physical absorption : Case IV - H T U data for Vaporization.

No.	T_L °C	T_G °C	a_t m^2/m^3	y_T x 10^2	y_B x 10^2	L	G ---kg/m^2s---	HTU m	$k_G a$ x 10^2 kmol/m^3sa
1	31.6	41.1	190	4.377	3.134	2.136	1.268	0.157	28.614
2	28.5	32.7	190	3.734	2.363	1.370	0.346	0.122	10.032
3	28.5	32.6	190	3.718	2.387	2.706	0.346	0.115	10.588
4	29.3	33.5	190	3.770	2.357	0.780	0.346	0.166	7.330
5	34.2	41.6	190	4.998	2.634	2.136	2.053	0.124	14.261
6	34.4	42.2	190	5.128	2.706	2.136	2.367	0.118	17.257
7	32.5	35.8	190	4.776	2.148	2.136	0.276	0.066	3.660
8	33.5	34.7	190	5.045	2.399	2.136	0.447	0.075	5.108
9	35.5	43.0	190	5.395	2.836	2.136	1.186	0.103	10.021
10	34.1	41.1	190	5.049	2.738	2.136	1.649	0.119	12.022

Relevant details regarding Table - 5.5 D

Data No.	System and Packing characteristics.
1-4	Vaporization of Water into air. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, Ref.(55).
5-10	Vaporization of Water into Freon 12. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, Ref.(55).

Table - (5.6)

Data bank for true liquid side mass transfer Coefficients (k_L) obtained by Danckwerts plot.

No.	T °C	a_t m^2/m^3	σ mN/m	ρ_L kg/m^3	μ_L mNs/m^2	$D_L \times 10^9$ m^2/s	L kg/m^2s	$k_L \times 10^4$ m/s
1	25.0	130	74.1	1055.0	1.220	1.539	6.595	1.315
2	25.0	130	74.1	1055.0	1.220	1.539	8.720	1.570
3	25.0	130	74.1	1055.0	1.220	1.539	9.538	1.720
4	25.0	130	74.1	1055.0	1.220	1.539	13.080	1.903
5	25.0	130	74.1	1055.0	1.220	1.539	17.440	2.129
6	25.0	290	75.6	1156.5	1.403	1.478	1.589	1.036
7	25.0	290	75.6	1156.5	1.403	1.478	3.132	1.124
8	25.0	290	75.6	1156.5	1.403	1.478	4.884	1.200
9	25.0	290	75.6	1156.5	1.403	1.478	6.102	1.280
10	25.0	390	77.0	1166.0	1.207	1.594	5.970	1.178
11	25.0	390	77.0	1166.0	1.207	1.594	3.498	1.158
12	25.0	390	77.0	1166.0	1.207	1.594	1.306	0.996
13	25.0	390	77.0	1174.0	1.386	1.460	10.683	1.386
14	25.0	390	77.0	1174.0	1.386	1.460	8.570	1.353
15	25.0	390	77.0	1174.0	1.386	1.460	6.105	1.268
16	25.0	390	77.0	1174.0	1.386	1.460	3.757	1.180
17	25.0	390	77.0	1174.0	1.386	1.460	2.055	1.190
18	25.0	390	77.0	1176.0	1.529	1.370	9.643	1.432
19	25.0	390	77.0	1176.0	1.529	1.370	8.350	1.415
20	25.0	390	77.0	1176.0	1.529	1.370	6.468	1.304
21	25.0	390	77.0	1176.0	1.529	1.370	3.528	1.326
22	25.0	390	77.0	1176.0	1.529	1.370	1.999	1.315
23	25.0	390	77.0	1200.0	1.859	1.210	10.680	1.273
24	25.0	390	77.0	1200.0	1.859	1.210	8.520	1.218
25	25.0	390	77.0	1200.0	1.859	1.210	5.160	1.140
26	25.0	390	77.0	1200.0	1.859	1.210	3.600	1.137
27	25.0	390	77.0	1200.0	1.859	1.210	2.280	1.112
28	25.0	464	77.0	1225.6	1.520	1.410	2.941	1.490
29	25.0	464	77.0	1225.6	1.520	1.410	3.922	1.550
30	25.0	464	77.0	1225.6	1.520	1.410	4.902	1.580

Table - 5.6 (contd.)

Relevant Details regarding Table - 5.6

Data No.	System and Packing Characteristics
1-5	Absorption of CO_2 into 0.6 M K_2CO_3 + 0.2 M $KHCO_3$ buffer solutions. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.038 m, Ref.(22).
6-9	Absorption of CO_2 into 1 M K_2CO_3 + 1 M $KHCO_3$ buffer solutions. Polyethylene R.R., σ_c = 33 mN/m, d_p = 0.016 m, Ref.(36).
10-27	Absorption of CO_2 into 1 M K_2CO_3 + 1 M $KHCO_3$ buffer solutions. (Sugar added to change kinematic viscosity) No. 10-13, $\nu = 1.035 \times 10^{-6} m^2/s$, No.14-18, $\nu = 1.18 \times 10^{-6} m^2/s$, No. 19-23, $\nu = 1.3 \times 10^{-6} m^2/s$, No. 24-27, $\nu = 1.55 \times 10^{-6} m^2/s$. Glass R.R., σ_c = 73 mN/m, d_p = 0.010 m, Ref.(37,38).
28-30	Absorption of CO_2 into 1 M K_2CO_3 + 1 M $KHCO_3$ buffer solutions. (Sugar added to modify kinematic viscosity), $\nu = 1.24 \times 10^{-6} m^2/s$, Glass R.R., σ_c = 73 mN/m, d_p = 0.010m Ref.(56).

Table - (5.7)

Data bank - (I) for overall gas side mass transfer coefficient during chemical absorption ($K_G a$).

No.	T_L °C	T_G °C	a_t m^2/m^3	[B] kmol/m^3	k_2 x 10^{-3} m^3/kmol.s	L ---kg/m^2s---	G	$K_G a$ x 10^2 kmol/m^3 s a
1	31.0	31.0	470	1.620	17.4410	2.790	0.383	15.600
2	31.0	31.0	470	1.620	17.4410	4.223	0.383	17.600
3	31.8	31.8	470	1.620	18.4740	1.474	0.382	10.900
4	31.5	31.5	470	1.620	18.0800	2.907	0.382	15.700
5	31.5	31.5	470	1.620	18.0800	4.381	0.382	17.700
6	31.0	31.0	470	1.620	17.4410	5.666	0.383	18.400
7	32.0	32.0	190	1.620	18.7410	1.410	0.343	5.600
8	31.5	31.5	190	1.620	18.0800	2.769	0.343	7.950
9	31.0	31.0	190	1.620	17.4410	5.740	0.344	11.300
10	25.3	25.0	375	1.048	10.3010	1.020	0.252	6.985
11	21.9	23.6	375	0.671	7.4665	1.001	0.255	6.318
12	32.2	27.8	375	1.715	19.3740	1.052	0.254	11.389
13	27.5	25.3	375	1.168	12.4300	1.028	0.255	8.809
14	33.6	31.1	375	1.280	19.7440	1.058	0.259	12.279
15	25.3	26.1	375	1.276	10.7420	1.051	0.262	10.277
16	25.3	25.3	375	1.333	10.8560	2.038	0.260	12.057
17	25.3	25.3	375	1.313	10.8150	1.058	0.262	9.921
18	25.3	25.5	375	1.354	10.8970	2.085	0.262	11.167
19	25.5	26.9	375	1.301	10.9780	3.526	0.260	14.637
20	28.9	27.2	375	1.344	14.2100	2.186	0.258	9.476
21	27.5	26.6	375	2.245	15.1580	1.085	0.259	11.345
22	25.7	27.8	375	2.070	12.8410	2.038	0.513	12.502
23	25.3	22.5	375	1.090	10.3810	2.086	0.132	14.014
24	25.5	25.8	375	1.033	10.4500	2.032	0.164	10.989
25	25.3	26.1	375	1.018	10.2450	5.493	0.259	15.038
26	25.3	26.4	375	0.980	10.1730	9.249	0.256	16.639
27	26.0	26.0	470	0.820	10.4310	2.588	0.418	11.034
28	27.2	27.2	470	1.700	13.4300	2.636	0.466	15.038
29	22.2	22.2	470	1.780	9.3429	2.685	0.365	9.509
30	22.2	22.2	370	1.370	8.6633	2.807	0.349	8.275
31	22.2	22.2	370	1.340	8.6155	1.611	0.349	6.629
32	22.2	22.2	370	0.930	7.9888	1.050	0.349	7.341
33	25.5	25.5	410	0.865	10.1700	1.031	0.610	9.699
34	25.5	25.5	410	0.918	10.2690	2.278	0.610	12.769
35	25.5	25.5	410	0.940	10.3120	4.069	0.610	15.927
36	25.5	25.5	275	0.875	10.1890	2.278	0.610	6.229
37	25.5	25.5	275	0.875	10.1890	1.031	0.610	4.849
38	25.5	25.5	275	0.875	10.1890	4.069	0.610	9.031
39	25.5	25.5	275	0.875	10.1890	0.515	0.610	4.449
40	25.5	25.5	275	0.875	10.1890	0.515	0.292	4.405
41	25.5	25.5	275	0.875	10.1890	0.515	0.292	6.940
42	25.5	25.5	275	0.875	10.1890	2.278	0.610	7.252
43	25.5	25.5	275	0.875	10.1890	1.031	0.610	5.828
44	25.5	25.5	275	0.875	10.1890	0.515	0.610	5.116
45	25.5	25.5	275	0.875	10.1890	4.069	0.610	9.788

Table - 5.7 (contd.)

No.	T_L	T_G	a_t	[B]	k_2 x 10^{-3}	L	G	$K_G a$ x 10^2
	°C	°C	m^2/m^3	kmol/m^3	m^3/kmol. s	---kg/m^2 s---		kmol/m^3 s a
46	25.5	25.5	203	0.935	10.3020	2.278	0.610	8.008
47	25.5	25.5	203	0.955	10.3400	4.340	0.610	10.722
48	25.5	25.5	203	0.905	10.2450	1.031	0.610	5.962
49	25.5	25.5	203	0.825	10.0950	2.278	0.610	7.430
50	25.5	25.5	203	0.750	9.9569	0.515	0.610	3.826
51	25.5	25.5	203	0.850	10.1420	4.340	0.610	9.877
52	25.5	25.5	203	0.755	9.9660	2.278	0.610	6.051
53	25.5	25.5	184	0.825	10.0950	2.278	0.610	5.517
54	25.5	25.5	184	0.825	10.0950	1.031	0.597	4.360
55	25.5	25.5	184	0.825	10.0950	4.340	0.597	7.563
56	25.5	25.5	184	0.800	10.0490	2.278	0.597	5.339
57	25.5	25.5	184	0.805	10.0580	2.278	0.292	5.650
58	25.5	25.5	184	0.790	10.0300	2.278	0.922	5.828
59	46.6	46.6	187	1.560	27.3620	1.627	0.896	8.008
60	46.6	46.6	187	1.573	27.3620	2.034	0.896	9.788
61	45.5	45.5	187	1.704	25.3340	3.052	0.896	12.902
62	47.2	47.2	187	1.746	28.0040	3.255	0.896	12.902
63	45.5	45.5	187	1.811	25.3340	3.560	0.896	15.572
64	46.6	46.6	187	1.599	27.3620	4.069	0.896	14.237
65	45.5	45.5	187	1.906	25.3340	6.001	0.896	20.465
66	43.3	43.3	187	1.880	23.4570	6.306	0.896	20.020
67	48.8	48.8	187	2.014	30.9030	7.527	0.896	22.690
68	46.6	46.6	187	1.355	27.3620	2.238	1.316	9.788
69	45.5	45.5	187	1.430	25.3340	3.052	1.316	13.347
70	46.6	46.6	187	1.423	27.3620	4.069	1.316	16.461
71	46.1	46.1	187	1.495	26.6070	5.086	1.316	18.686
72	43.3	43.3	187	1.652	23.4570	6.239	1.316	21.800
73	32.5	32.5	370	0.211	0.7055	1.269	0.153	1.433
74	32.5	32.5	370	0.523	0.7055	1.269	0.153	2.207
75	32.5	32.5	370	0.864	0.7055	1.269	0.153	3.297
76	32.5	32.5	370	1.696	0.7055	1.269	0.153	4.938
77	32.5	32.5	370	1.857	0.7055	1.269	0.153	5.294
78	32.5	32.5	370	2.790	0.7055	1.269	0.153	6.852
79	32.5	32.5	370	0.227	0.7055	2.539	0.153	1.793
80	32.5	32.5	370	0.470	0.7055	2.539	0.153	2.709
81	32.5	32.5	370	0.948	0.7055	2.539	0.153	4.049
82	32.5	32.5	370	1.865	0.7055	2.539	0.153	5.739
83	32.5	32.5	370	2.848	0.7055	2.539	0.153	7.163
84	32.5	32.5	370	0.227	0.7055	3.808	0.153	2.176
85	32.5	32.5	370	0.463	0.7055	3.808	0.153	2.905
86	32.5	32.5	370	1.010	0.7055	3.808	0.153	4.320
87	32.5	32.5	370	1.841	0.7055	3.808	0.153	6.229
88	32.5	32.5	370	2.829	0.7055	3.808	0.153	7.741
89	32.5	32.5	370	0.233	0.7055	5.078	0.153	2.291
90	32.5	32.5	370	0.967	0.7055	5.078	0.153	4.760
91	32.5	32.5	370	0.923	0.7055	5.078	0.153	4.583
92	32.5	32.5	370	1.905	0.7055	5.053	0.153	6.095
93	32.5	32.5	370	2.817	0.7055	5.029	0.153	7.741
94	32.5	32.5	370	0.238	0.7055	6.347	0.153	2.429
95	32.5	32.5	370	0.470	0.7055	6.347	0.153	3.439

Table - 5.7 (contd.)

No.	T_L	T_g	a_t	[B]	k_2	L	G	$K_g a$
					$\times 10^{-3}$			$\times 10^{2}$
	°C	°C	m^2/m^3	kmol/m^3	m^3/kmol. s	---kg/m^2s---		kmol/m^3s a
96	32.5	32.5	370	1.018	0.7055	6.347	0.153	4.849
97	32.5	32.5	370	1.908	0.7055	6.323	0.153	6.229
98	32.5	32.5	370	2.880	0.7055	6.298	0.153	8.631
99	11.0	10.0	190	0.348	2.9456	6.075	0.475	5.000
100	12.5	10.9	190	0.273	3.2865	6.214	0.475	4.250
101	10.4	11.2	190	0.161	2.7079	6.539	0.450	3.194
102	11.5	11.4	190	0.132	2.9499	6.561	0.450	2.639
103	12.1	11.8	190	0.113	3.0882	6.542	0.450	2.681
104	13.2	12.2	190	0.061	3.3465	6.831	0.435	2.672
105	12.6	12.9	190	0.288	3.3226	3.800	0.431	2.861
106	14.5	14.0	190	0.194	3.8102	3.861	0.426	3.056
107	11.8	11.7	190	0.096	3.0037	3.753	0.428	2.192
108	12.4	12.1	190	0.064	3.1369	3.819	0.422	1.803
109	12.0	11.6	190	0.079	3.0437	2.233	0.428	1.447
110	11.3	10.9	190	0.046	2.8559	0.728	0.419	0.806
111	12.6	12.6	190	0.152	3.2402	0.411	0.428	1.008
112	24.0	24.0	242	0.629	1.1656*	1.329	0.229	1.335
113	24.0	24.0	242	0.619	1.1656*	1.329	0.205	1.424
114	21.0	21.0	242	0.624	0.9359*	1.329	0.195	1.290
115	21.0	21.0	242	0.614	0.9359*	1.329	0.182	1.157
116	22.0	22.0	242	0.609	1.0074*	1.329	0.155	2.047
117	19.0	19.0	242	0.549	0.8064*	2.224	0.397	1.691
118	24.0	24.0	242	0.634	1.1656*	1.655	0.385	1.513
119	24.0	24.0	242	0.621	1.1656*	3.336	0.258	1.735
120	25.0	25.0	242	1.166	1.2529*	3.336	0.330	3.292
121	30.0	30.0	330	0.820	9.9167	1.667	0.208	7.589
122	30.0	30.0	330	0.820	9.9167	1.111	0.208	6.839
123	30.0	30.0	330	0.820	9.9167	1.361	0.208	7.311
124	30.0	30.0	330	0.820	9.9167	0.393	0.208	4.836
125	30.0	30.0	330	0.820	9.9167	0.237	0.208	4.083
126	30.0	30.0	330	0.820	9.9167	0.407	0.208	4.897
127	30.0	30.0	330	0.820	9.9167	0.526	0.208	5.556
128	30.0	30.0	330	0.820	9.9167	0.756	0.208	4.897
129	30.0	30.0	330	0.820	9.9167	1.066	0.208	6.433
130	30.0	30.0	330	0.820	9.9167	1.264	0.208	7.453
131	30.0	30.0	330	0.820	9.9167	1.890	0.208	7.453
132	30.0	30.0	330	0.820	9.9167	3.420	0.208	9.139
133	30.0	30.0	330	0.460	8.7500	1.667	0.208	5.183
134	30.0	30.0	330	0.460	8.7500	1.111	0.208	4.358
135	30.0	30.0	330	0.460	8.7500	1.361	0.208	4.747
136	30.0	30.0	330	0.460	8.7500	0.410	0.208	3.611
137	30.0	30.0	330	0.460	8.7500	1.519	0.208	5.214
138	30.0	30.0	330	0.460	8.7500	1.890	0.208	5.556
139	30.0	30.0	330	0.460	8.7500	2.176	0.208	6.256
140	30.0	30.0	330	0.460	8.7500	3.444	0.208	7.147
141	30.0	30.0	330	0.240	8.1390	1.667	0.208	3.928
142	30.0	30.0	330	0.240	8.1390	1.446	0.208	3.847
143	30.0	30.0	330	0.240	8.1390	2.536	0.208	4.706
144	30.0	30.0	330	0.240	8.1390	3.303	0.208	5.183
145	30.0	30.0	330	0.126	7.8330	1.983	0.208	3.444
146	30.0	30.0	330	0.126	7.8330	3.444	0.208	3.911

Table - 5.7 (contd.)

No.	T_L	T_G	a_t	[B]	β	L	G	$K_G a$
	°C	°C	m^2/m^3	$kmol/m^3$		---kg/m^2s---		x 10^2 $kmol/m^3 s$ a
147	29.9	29.7	190	0.226	46.30	7.889	0.508	21.111
148	29.9	29.7	190	0.218	34.15	7.889	0.508	16.472
149	30.0	29.8	190	0.207	40.60	7.889	0.508	19.000
150	30.0	29.8	190	0.194	30.00	7.944	0.508	14.833
151	30.0	29.8	190	0.184	28.50	7.944	0.508	14.056
152	29.9	29.8	190	0.172	33.80	7.944	0.514	16.333
153	30.1	29.9	190	0.161	22.60	7.944	0.514	11.472
154	30.1	29.9	190	0.149	25.40	8.028	0.514	12.861
155	30.0	29.8	190	0.139	18.30	8.028	0.514	9.611
156	30.0	29.8	190	0.132	23.60	8.028	0.531	12.278
157	30.1	29.9	190	0.126	18.75	8.028	0.531	9.667
158	30.1	30.1	190	0.113	18.90	8.111	0.531	10.111
159	30.1	30.0	190	0.103	18.00	8.111	0.531	9.667
160	30.0	30.0	190	0.097	12.61	8.111	0.531	6.972
161	30.0	29.9	190	0.085	15.40	8.111	0.522	8.361
162	30.0	29.8	190	0.073	10.65	8.139	0.522	6.000

Relevant details regarding Table - 5.7 :

Data No.	System and Packing Characteristics.
1-9	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, dp = 0.0095 m, Ref.(53).
10-26	Absorption of CO_2 into NaOH solutions. Carbon R.R., σ_c = 56 mN/m, dp = 0.013 m, Ref.(57).
27-32	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, No.27-29, dp = 0.0095 m, No.30-32 dp = 0.013 m, Ref.(58,59).
33-58	Absorption of CO_2 into NaOH solutions. No.33-52, Ceramic R.R., σ_c = 61 mN/m, No. 53-58, Steel R.R., σ_c = 75 mN/m, No. 33-35, dp = 0.013m, No.36-45, dp = 0.019 m, No. 46-58, dp = 0.025 m, Ref.(60,61).
59-72	Absorption of CO_2 into Monoethanolamine solutions. Steel R.R., σ_c = 75 mN/m, dp = 0.025 m, Ref.(62).

Table - 5.7 (contd.)

73-98	Absorption of CO_2 into aqueous ammonia solutions. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.013 m, Ref.(63).
99-111	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, Ref.(64).
112-120	Absorption of CO_2 into Diethanolamine solutions. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.019 m, Ref.(65). (Note * indicates k_3 values instead of k_2 values)
121-146	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.015 m, Ref.(66).
147-162	Absorption of CO_2 into KOH solutions. Ceramic R.R., σ_c = 61 mN/m, d_p = 0.025 m, Ref.(67). (Note β values are reported instead of k_2 values)

Table - (5.8)

Data bank - (II) for overall gas side mass transfer coefficient during chemical absorption ($K_g a$). Very low concentration of reactive species.

No.	T_L °C	T_g °C	a_t m^2/m^3	[B] kmol/m^3	k_2 x 10^{-3} m^3/kmol.s	L ---kg/m^2s---	G	$K_g a$ x 10^2 kmol/m^3s a
1	23.3	23.3	470	0.130	7.4970	0.854	0.357	1.290
2	26.6	26.6	470	0.040	9.4473	2.124	0.308	1.157
3	26.6	26.6	470	0.040	9.4473	2.173	0.308	1.201
4	25.0	25.0	470	0.040	8.3835	0.610	0.288	0.578
5	23.8	23.8	470	0.150	7.8153	1.245	0.353	1.602
6	23.9	23.9	470	0.180	7.9064	3.466	0.353	3.381
7	26.7	26.7	470	0.050	9.5070	1.684	0.308	1.602
8	27.3	27.3	370	0.040	9.9723	2.929	0.381	1.691
9	27.8	27.8	370	0.040	10.3010	2.807	0.268	1.557
10	11.9	11.9	370	0.049	3.0522	7.183	0.400	2.069
11	10.7	10.7	370	0.047	2.7407	3.844	0.419	1.458
12	10.3	10.3	370	0.017	2.6590	2.222	0.431	0.842
13	10.0	10.0	370	0.011	2.6124	2.222	0.431	0.733
14	30.0	30.0	330	0.063	7.1944	1.667	0.208	1.576
15	30.0	30.0	330	0.063	7.1944	1.111	0.208	1.189
16	30.0	30.0	330	0.063	7.1944	1.361	0.208	1.361
17	30.0	30.0	330	0.063	7.1944	0.393	0.208	0.556
18	30.0	30.0	330	0.063	7.1944	0.397	0.208	0.522
19	30.0	30.0	330	0.063	7.1944	0.742	0.208	0.858
20	30.0	30.0	330	0.063	7.1944	2.127	0.208	1.871
21	30.0	30.0	330	0.063	7.1944	3.565	0.208	2.426
22	30.0	29.8	370	0.078	11.80*	8.083	0.511	7.889
23	30.1	29.9	370	0.068	10.20*	8.083	0.511	6.917
24	29.9	29.7	370	0.054	8.44*	8.083	0.511	5.806

Relevant details regarding Table - 5.8 :

Data No.	System and Packing Charecteristics.
1-11	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, No.1-7, D_p = 0.0095 m, No.8-9, D_p = 0.013 m, Ref.(58,59).
10-13	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, D_p = 0.013 m, Ref.(64,67).
14-21	Absorption of CO_2 into NaOH solutions. Ceramic R.R., σ_c = 61 mN/m, D_p = 0.015 m, Ref.(66).
22-24	Absorption of CO_2 into KOH solutions. Ceramic R.R., σ_c = 61 mN/m, D_p = 0.013 m, Ref.(67). Note :- (*) indicates β values instead of k_2 values