TABLE 7. DEW-POINT OF AIR IN EQUILIBRIUM WITH LITHIUM CHLORIDE SOLUTIONS
CONCENTRATION IN GRAM MOLS OF LITHIUM CHLORIDE PER 1000 GRAINS WATER

0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0
320	315.2	308.7	299.9	290.2	279.7	269.4	259.6	251.5	244.1	236.5	230.0	223.8	218.6	214.5	210.3
300	295.4	289.1	280.5	270.9	260.6	250.5	240.8	232.6	225.4	218.0	211.8	205.8	200.8	196.9	192.8
280	275.6	269.5	261.1	251.7	241.5	231.6	222.2	214.0	206.7	199.7	193.5	187.8	183.2	179.3	175.2
260	255.8	250.0	241.9	232.6	222.7	212.8	203.5	195.5	188.4	181.7	175.4	170.0	165.6	162.0	158.4
240	236.0	230.4	222.5	213.5	203.8	194.2	185.0	177.1	170.0	163.6	157.5	152.2	148.3	144.6	140.5
220	216.2	210.8	203.2	194.4	184.9	175.5	166.4	158.6	151.6	145.3	139.6	134.6	130.7	127.3	124.2
200	196.4	191.2	183.9	175.4	166.1	156.7	148.0	140.3	133.5	127.3	121.9	117.0	113.3	110.1	
180	176.6	171.6	164.7	146.4	147.3	138.1	129.6	122.1	115.5	109.4	104.2	99.6	96.0		
160	156.8	152.1	145.4	137.4	128.6	119.7	111.3	103.9	97.4	91.6	86.6	82.2			
140	137.0	132.6	126.1	118.4	109.9	101.3	93.1	85.9	79.5	73.8	69.0				
120	117.2	113.0	106.8	99.4	91.1	82.7	74.7	67.8	61.5	56.0					
110	107.3	103.2	97.2	89.9	81.9	73.5	65.6	58.8	52.6	47.1					
100	97.4	93.4	87.5	80.5	72.7	64.4	56.6	49.8	43.7	38.2					
90	87.5	83.6	77.9	71.0	63.3	54.2	47.6	40.8	34.8	29.3					
80	77.6	73.8	68.4	61.6	54.0	46.1	38.5	31.8	25.9	20.6					
70	67.7	64.0	58.7	52.2	44.8	37.0	29.5	22.9	17.2	12.0					
60	57.8	54.3	49.1	42.7	35.5	27.9	20.5	14.0	8.3						
40	38.0	34.7	29.9	23.9	16.9	9.6	2.4	−3.9							
20		15.1	10.7	5.0	−1.7	−8.7	−15.4								
0		−4.5	−8.6	−13.9	−20.2	−27.0	−33.3								

combined is obtainable from steam tables. For instance, at 60 F the amount of this heat is about 1057 Btu. In addition to this heat there is involved also the so-called heat of mixing which is frequently considerable.

Temperature-Pressure-Concentration Relations

Since the absorption process can continue only as long as there is a difference in vapor pressure between the absorbent and the air-vapor mixture and since at a given temperature of the absorbent the vapor pressure depends on the concentration of the solution, evidently there

TABLE 8. DENSITY OF LITHIUM CHLORIDE SOLUTIONS

CONCENTRATION MOLS *LiCl* PER 1000 GRAINS WATER	TEMPERATURE DEG F						
	0	50	100	150	200	250	300
0							
2		1.045	1.037	1.026	1.012		
4	1.090	1.085	1.076	1.064	1.052		
6	1.124	1.119	1.111	1.100	1.087		
8	1.156	1.150	1.143	1.132	1.122		
10	1.188	1.181	1.172	1.162	1.152	1.142	
12	1.217	1.209	1.199	1.188	1.178	1.168	
14	1.242	1.235	1.225	1.214	1.203	1.192	
16		1.257	1.248	1.236	1.226	1.215	
18		1.279	1.270	1.259	1.248	1.237	
20			1.291	1.280	1.279	1.568	
22				1.310	1.289	1.278	1.267
24				1.317	1.307	1.296	1.286
26					1.313	1.312	1.302
28					1.338	1.327	1.318
30						1.34	1.33
32							1.35

TABLE 9. VISCOSITY OF LITHIUM CHLORIDE SOLUTIONS (MILLIPOISE)

TEMP. DEG F	CONCENTRATION IN MOLAL												
	0	2	4	6	8	10	12	14	16	18	20	22	24
0			56.75	72.44	97.05	136.8	199.5						
20		28.91	37.07	47.42	63.09	84.94	123.3	178.6					
40	15.45	19.91	25.53	32.58	43.05	58.48	81.10	116.1	165.6				
60	11.02	14.26	18.37	23.55	30.90	41.40	56.62	79.80	111.2	156.3			
80	8.61	11.19	14.42	18.62	24.32	32.28	43.45	60.26	82.04	113.8			
100	6.82	8.89	11.48	14.94	19.36	25.59	33.96	46.13	61.52	84.72	118.3		
120	5.60	7.31	9.51	12.30	15.92	20.99	27.67	36.64	48.31	65.77	89.95		
140	4.70	6.15	8.07	10.42	13.43	17.66	22.96	30.06	38.99	52.48	71.12	95.94	
160	4.01	5.25	6.92	8.93	11.51	15.00	19.36	25.06	32.14	42.76	56.89	75.86	106.2
180	3.48	4.56	6.01	7.78	10.00	12.91	16.56	21.28	27.10	35.48	46.45	60.67	84.33
200	3.05	4.01	5.28	6.86	8.79	11.22	14.32	18.28	23.12	29.92	38.55	50.70	67.92
220	2.72	3.58	4.72	6.14	7.83	9.93	12.59	16.00	20.14	25.64	32.96	43.05	56.49
240	2.43	3.21	4.25	5.50	7.02	8.83	11.12	14.09	17.62	22.18	28.31	36.98	47.42
260	2.19	2.90	3.84	4.94	6.46	7.91	9.91	12.47	15.50	19.36	24.60	31.92	40.55
280	2.00	2.66	3.52	4.51	5.75	7.19	8.97	11.27	14.00	17.22	21.78	28.05	35.56
300	1.86	2.48	3.28	4.17	5.32	6.67	8.28	10.38	12.82	15.70	19.68	25.12	31.92
320	1.74	2.32	3.08	3.89	4.94	6.19	7.73	9.64	11.86	14.45	18.03	22.80	29.11

must be a relation between these quantities which if known would state the limits of the process. The relationship would also depend on the absorbent being used, and would have to be determined for each substance used as an absorbent. Fig. 2 shows this relationship graphically for lithium chloride. It will be noted that this chart is essentially similar to that shown in Fig. 1 and its direct usefulness is limited by much the same considerations.

In order to permit numerical calculations of air conditioning problems it is desirable to have tables for use instead of a chart like Fig. 2, and Tables 7, 8, 9 and 10 can be used in making calculations for lithium chloride.

TABLE 10. PROPERTIES OF LITHIUM CHLORIDE SOLUTIONS

CONCENTRATION MOLS (42.4 GRAMS *LiCl* PER 1000 GRAINS WATER)	PARTIAL HEAT OF MIXING AT 0 F BTU PER LB	TEMPERATURE COEF. OF PARTIAL HEAT OF MIXING BTU PER LB PER F	SPECIFIC HEAT AT 70 F	BOILING POINT F (AT 760 MM Hg)	FREEZING POINT	SUBSTANCE THAT FIRST SEPARATES OUT ON FREEZING
0	0.0	0.0	0.998	212.0	32	Ice
2	2.04	−0.014	0.901	215.8	16.3	Ice
4	7.24	−0.036	0.831	221.5	−5.8	Ice
6	16.7	−0.069	0.778	228.9	−34.2	Ice
8	31.9	−0.109	0.739	238.1	−69	Ice
10	51.1	−0.143	0.710	248.4	−90	Ice
12	75.7	−0.160	0.687	258.8	−40	$LiCl\text{-}3H_2O$
14	90.8	−0.167	0.666	268.9	1	$LiCl\text{-}3H_2O$
16	124.8	−0.176	0.647	277.9	36.5	$LiCl\text{-}2H_2O$
18	145	−0.186	0.631	285.8	58.1	$LiCl\text{-}2H_2O$
20	162	−0.194	0.617	293.2	86.4	$LiCl\text{-}H_2O$
22	171	−0.20	0.604	300.2	133	$LiCl\text{-}H_2O$
24	177	−0.20	0.59	307	156	$LiCl\text{-}H_2O$
26	182	−0.21	0.58	313	180	$LiCl\text{-}H_2O$
28	191	−0.21	0.575	318	190	$LiCl\text{-}H_2O$
30	194	−0.21	0.57	323	195	$LiCl\text{-}H_2O$
32	198	−0.22	0.56	328	280	*LiCl*