Appendix 2
Solutions of sucrose, corn syrup and other monosaccharides and disaccharides

Table A2.1 Comparison of Brix and Baumé concentrations of aqueous sucrose solutions at 20°C (68°F).

Degrees Brix	Degrees Baumé
5	2.8
10	5.6
15	8.3
20	11.1
25	13.8
30	16.6
35	19.3
40	22
45	24.6
50	27.5
55	30.2
60	32.5
65	35
70	37.6
75	40.3
80	42.5
85	44.9
90	47.4
95	49.5

Comment: Linear interpolation provides fair results:

Degrees Brix	Degrees Baumé	Interpolated values
10	5.57	
15	8.34	
12.5	6.96	6.955
60	32.49	
65	35.04	
62.5	33.77	33.765
80	42.47	
85	44.86	
82.5	43.67	43.665

For a detailed scale (per 0.5 degree Brix), see Meiners *et al.* (1983, Vol. 1/I, p. 11).

 ISBN: 978-1-405-19470-9

Table A2.2 Sugar content and density of saturated aqueous sucrose solutions as a function of temperature (Antokolskaya *et al.* 1964).

Temperature (°C)	Sugar (g/100 g water)	Density (kg/m^3)
0	179.2	1314
5	184.7	1319.2
10	190.5	1323.5
15	197	1328
20	203.9	1332.7
25	211.4	1342.7
30	219.9	1345.7
35	228.4	1348
40	238.1	1353.5
45	248.7	1359.2
50	260.4	1365.1
55	273.1	1371.2
60	287.3	1377.5
65	302.9	1384
70	320.5	1390.8
75	339.9	1397.7
80	362.1	1404.9
85	386.8	1412.2
90	415.7	1419.9
95	448.6	1427.7
100	487.2	1435.9

Table A2.3 Solubility number of sucrose as a function of temperature (Sokolovsky 1958, p. 15).

t (°C)	(m/m%)	100σ
0	64.18	179.1736
10	65.58	190.5288
20	67.09	203.859
30	68.7	219.4888
40	70.42	238.0663
50	72.25	260.3604
60	74.18	287.2967
70	76.22	320.5214
80	78.36	362.1072
90	80.84	421.9207
100	82.97	487.1991

For further details, see Maczelka (1962, p. 24).

Melting-point values of sucrose (depending on purity): 185–190°C.
Mean specific heat capacity of sucrose (in the range 0–100°C):

$$c_P = 0.2712 + 0.00103t \text{ (kcal/kg °C)}$$

$$(1 \text{ cal} = 4.1868 \text{ J}).$$

For further details, see Maczelka (1962, p. 27).

Table A2.4 Solubility of sugar in water in the presence of glucose syrup (Sokolovsky 1958, p. 16).

	100 g solution consists of		100 g water dissolves		
Temperature (°C)	Sugar (g)	Syrup (g)	Sugar (g)	Syrup (g)	Total dry weight (g)
20	67.09	0	203	0	203
	57.54	10.56	180.2	33.1	213.3
	51.23	17.74	165.09	57.17	222.26
	48.51	21.76	163.16	73.19	236.35
	43.26	28.8	154.82	103.07	257.89
50	72.25	0	260.36	0	260.36
	62.97	10.05	233.39	37.25	270.64
	55.65	18.26	208.16	69.01	277.17
	51.03	24	204.37	96.12	300.49
	46.81	28.86	193.19	119.52	312.71
	44.47	32.02	189.15	136.2	325.35
	37.96	40.54	176.56	188.56	365.12
70	76.22	0	322.83	0	322.83
	67.43	9.92	297.79	43.7	341.49
	60.6	17.55	277.35	80.32	357.67
	55.14	24.95	276.95	125.31	402.26
	52.7	28.1	274.48	146.35	420.83
	49.69	32.16	273.77	177.19	450.96

Table A2.5 Solubility of sugar in water in the presence of invert syrup (Sokolovsky 1958, p. 17).

	100 g solution consists of		100 g water dissolves		
Temperature (°C)	Sugar (g)	Invert sugar (g)	Sugar (g)	Invert sugar (g)	Total dry weight (g)
23.1	67.59	0	208.55	0	208.55
	57.84	11.9	191.14	39.32	230.46
	47.31	25.39	173.3	93	266.3
	38.66	36.9	158.18	150.98	309.16
30	68.11	0	213.58	0	213.58
	56.32	14.94	195.96	51.98	247.94
	50.97	21.86	187.6	80.46	268.06
	49.91	23.21	185.68	86.34	272.02
	48.95	24.46	184.09	91.99	276.08
	46.36	28.01	180.88	109.29	290.17
	39.23	37.48	168.43	160.93	329.36
	32.06	47.02	153.25	224.76	378.01
	31.85	47.62	155.13	231.95	387.08
	26.03	56.37	147.9	320.28	468.18
	21.18	63.68	139.89	420.61	560.5
	20.59	64.47	137.82	431.52	569.34
50	72.22	0	260.36	0	260.36
	62.81	11.42	243.73	44.31	288.04
	53.8	22.65	228.45	96.17	324.62
	46.2	32.32	215.08	150.46	365.54
	36.75	46.05	196.43	253.2	449.63