β MALAMINIC ACID $CH_2(OH)COOH:CH_2CONH_2$, $CH_2COO.NH_3.CHCOOH$

SOLUBILITY IN WATER AT 18°. (Lutz, 1902.)

Compound.	M.-pt.	Gms. per 100 Gms. H_2O.	$(\alpha)_D$ in Water $C=1, l=2$.
d β Malaminic Acid	149	7.52	+9.70
l "	149	7.50	−9.33
r "	148	4.02	...

MALEIC ACID COOHCH:CH.COOH (see also p. 304).

SOLUBILITY IN SEVERAL ALCOHOLS. (Timofeiew, 1894.)

Alcohol.	t°.	Gms. $(CHCOOH)_2$ per 100 Gms. Sat. Sol.	Alcohol.	t°.	Gms. $(CHCOOH)_2$ per 100 Gms. Sat. Sol.
Methyl Alcohol	22.5	41	Propyl Alcohol	0	20
Ethyl Alcohol	0	30.2	"	22.5	24.3
"	22.5	34.4	Isobutyl Alcohol	0	14.2
			"	22.5	17.5

Data for the distribution of maleic acid between ether and water at 25° is given by Chandler, 1908.

Freezing-point data for mixtures of maleic acid and *l* mandelic acid are given by Centnerszwer, 1899.

MALIC ACID *l* COOH.CH_2CHOHCOOH.

100 gms.	methyl alcohol	dissolve	124.8	gms.	malic acid	at	0°.	(Timofeiew, 18
"	"	"	167.7	"	"	"	19.1°.	"
"	ethyl	"	91.4	"	"	"	19°.	"
"	propyl	"	54	"	"	"	19°.	"
"	dichlorethylene	"	0.009	"	"	"	15°.	(Wester & Bruins, 189
"	trichlorethylene	"	0.010	"	"	"	15°.	" "

DISTRIBUTION OF MALIC ACID BETWEEN WATER AND ETHER. (Pinnow, 1915.)

Results at 15°.			Results at 25.5°.		
Gm. Mols. Acid per Liter:		Dist. Coeff.	Gm. Mols. Acid per Liter.		Dist. Coeff.
H_2O Layer.	Ether Layer.		H_2O Layer.	Ether Layer.	
0.564	0.0091	62	1.179	0.0172	68.4
0.288	0.0045	64	0.582	0.0082	71
0.151	0.0024	62.9	0.293	0.0040	73
0.967	0.0157	61.6	0.142	0.0020	71

Freezing-point data for *i* malic acid + *l* mandelic acid are given by Centnerszwer, 1899.

MALONIC ACID $CH_2(COOH)_2$.

SOLUBILITY IN WATER.

(Klobbie, 1897; Miczynski, 1886; Henry, 1884; Lamouroux, 1898, 1899.)

t°.	Gms. $CH_2(COOH)_2$ per 100.		t°.	Gms. $CH_2(COOH)_2$ per 100.	
	Gms. Solution.*	cc. Solution (L.).		Gms. Solution.*	cc. Solution (L.
0	52	61	50	71	93
10	56.5	67	60	74.5	100
20	60.5	73	70	...	106
25	62.2	76.3	80	82	...
30	64	80	100	89	...
40	68	86.5	132 m. pt.	100	...

* Average curve from results of K., M., and H.

100 gms. 95% formic acid dissolve 22.42 gms. malonic acid at 19.5°. (Aschan, 191

Solubility of Malonic Acid in Alcohols.

(Timofeiew, 1894.)

Alcohol.	t°.	Gms. $CH_2(COOH)_2$ per 100 Gms. Sat. Sol.	Alcohol.	t°.	Gms. $CH_2(COOH)_2$ per 100 Gms. Sat. Sol.
Ethyl Alcohol	−18.5	42.7	Ethyl Alcohol	+19.5	41.3
" "	−15	43.5	Propyl Alcohol	−18.5	19.5
" "	0	47.3	" "	−15	20.2
" "	+19	52.5	" "	0	24.3
" "	+19.5	53.3	" "	+19	29.5
Ethyl Alcohol	−18.5	30	" "	+19.5	30.7
" "	−15	30.7	Isobutyl Alcohol	0	17.5
" "	0	35.3	" "	19	21.2
" "	+19	40.1			

Solubility of Malonic Acid in Ether.

(Klobbie, 1897.)

t°.	Gms. $CH_2(COOH)_2$ per 100 Gms. Solution.	t°.	Gms. $CH_2(COOH)_2$ per 100 Gms. Solution.	t°.	Gms. $CH_2(COOH)_2$ per 100 Gms. Solution.
0	6.25	30	10.5	100	46
10	7.74	80	33	110	56
20	9	90	39	120	70
25	9.7			132 m. pt.	100

100 gms. saturated solution of malonic acid in pyridine contain 14.6 gms. at 26°. (Holty, 1905.)

Solubility of Substituted Malonic Acids in Water.

(Lamouroux, 1899.)

t°.	Gms. per 100 cc. Saturated Aqueous Solution.					
	Malonic Acid.	Methyl Malonic Acid.	Ethyl Malonic Acid.	n Propyl Malonic Acid.	n Butyl Malonic Acid.	Iso Amyl Malonic Acid.
0	61.1	44.3	52.8	45.6	11.6	38.5
15	70.2	58.5	63.6	60.1	30.4	51.8
25	76.3	67.9	71.2	70	43.8	79.3
30	92.6	91.5	90.8	94.4	79.3	83.4

Distribution of Malonic Acid between Ether and Water at 25°.

(Chandler, 1908.)

Mols. Acid per Liter.		Coef. $\frac{\text{Conc. } H_2O}{\text{Conc. Ether}}$.	Dist. Coef. corrected for Ionization.
H_2O Layer.	Ether Layer.		
0.1478	0.0135	10.94	9.86
0.1121	0.0102	11.07	9.79
0.0862	0.0076	11.28	9.86
0.0331	0.0027	12.22	9.82

Mesaconic Acid $C_6H_8.CH(OH)COOH$ *i* and *d*.

Solubility in Several Solvents.

Solvent.	t°.	Gms. $C_6H_8CHOHCOOH$ per 100 Gms. Sat. Sol.		Authority.
Water	20	15.95	(inactive acid)	(Schlossberg, 1900.)
"	20	19.17	(dextro acid)	"
Methyl Alcohol	0	51.1	(inactive acid)	(Timofeiew, 1894.)
"	16.5	64.9	"	"
Ethyl Alcohol	0	46.7	"	"
"	16.5	53.6	"	"
Propyl Alcohol	0	35	"	"
"	16.5	43	"	"
95% Formic Acid	19	40	"	(Aschan, 1913.)