

TABLE OF ACID DISSOCIATION CONSTANTS (25°C)

ACID NAME	ACID FORM	BASE FORM	pK _a	K _a
acetic acid	CH ₃ COOH	CH ₃ COO ⁻¹	4.757	1.75 x 10 ⁻⁵
ammonium (ammonia=base)	NH ₄ ⁺¹	NH ₃	9.244	5.70 x 10 ⁻¹⁰
anilinium (aniline=base)	C ₆ H ₅ NH ₃ ⁺¹	C ₆ H ₅ NH ₂	4.601	2.51 x 10 ⁻⁵
benzoic acid	C ₆ H ₅ COOH	C ₆ H ₅ COO ⁻¹	4.202	6.28 x 10 ⁻⁵
carbonic acid*	H ₂ CO ₃	HCO ₃ ⁻¹	6.352	4.45 x 10 ⁻⁷
hydrogen carbonate ion	HCO ₃ ⁻¹	CO ₃ ⁻²	10.329	4.69 x 10 ⁻¹¹
chloroacetic acid	ClCH ₂ COOH	ClCH ₂ COO ⁻¹	2.865	1.36 x 10 ⁻³
chlorous acid	HClO ₂	ClO ₂ ⁻¹	1.96	1.10 x 10 ⁻²
dimethylammonium (dimethylamine = base)	(CH ₃) ₂ NH ₃ ⁺¹	(CH ₃) ₂ NH	10.774	1.68 x 10 ⁻¹¹
formic acid	HCOOH	HCOO ⁻¹	3.745	1.80 x 10 ⁻⁴
glycine•H ⁺ (ammonium ion)	HOOCCH ₂ NH ₃ ⁺¹	⁻¹ OOCCH ₂ NH ₃ ⁺¹	2.350	4.47 x 10 ⁻³
glycine (zwitter ion)	⁻¹ OOCCH ₂ NH ₃ ⁺¹	⁻¹ OOCCH ₂ NH ₂	9.778	1.67 x 10 ⁻¹⁰
hydrocyanic acid	HCN	CN ⁻¹	9.21	6.2 x 10 ⁻¹⁰
hydrofluoric acid	HF	F ⁻¹	3.17	6.8 x 10 ⁻⁴
hydrosulfuric acid	H ₂ S	HS ⁻¹	7.02	9.5 x 10 ⁻⁸
hydrogen sulfide ion	HS ⁻¹	S ⁻²	17	10 ⁻¹⁷
hypochlorous acid	HOCl	OCl ⁻¹	7.53	3.0 x 10 ⁻⁸
iodic acid	HIO ₃	IO ₃ ⁻¹	0.77	0.17
methylamine	CH ₃ NH ₃ ⁺¹	CH ₃ NH ₂	10.64	2.3 x 10 ⁻¹¹
nitrous acid	HNO ₂	NO ₂ ⁻¹	3.35	4.8 x 10 ⁻⁴
oxalic acid	HOCCOOH	HOCCOO ⁻¹	1.252	5.60 x 10 ⁻²
hydrogen oxalate ion	HOCCOO ⁻¹	⁻¹ OCCOO ⁻¹	4.266	5.42 x 10 ⁻⁵
phosphoric acid	H ₃ PO ₄	H ₂ PO ₄ ⁻¹	2.148	7.11 x 10 ⁻³
dihydrogen phosphate	H ₂ PO ₄ ⁻¹	HPO ₄ ⁻²	7.199	6.32 x 10 ⁻⁸
monohydrogen phosphate	HPO ₄ ⁻²	PO ₄ ⁻³	12.15	7.1 x 10 ⁻¹³
phthalic acid	HOCC ₆ H ₄ COOH	HOCC ₆ H ₄ COO ⁻¹	2.950	1.12 x 10 ⁻³
hydrogen phthalate ion	HOCC ₆ H ₄ COO ⁻¹	⁻¹ OCC ₆ H ₄ COO ⁻¹	5.408	3.90 x 10 ⁻⁶
piperdinium (piperdine=base)	C ₅ H ₁₀ NH ₃ ⁺¹	C ₅ H ₁₀ NH	11.123	7.53 x 10 ⁻¹²
propanoic acid	CH ₃ CH ₂ COOH	CH ₃ CH ₂ COO ⁻¹	4.874	1.34 x 10 ⁻⁵
pyridinium (pyridine=base)	C ₅ H ₅ NH ₃ ⁺¹	C ₅ H ₅ N	5.229	5.90 x 10 ⁻⁶
TRIS or THAM	(HOCH ₂) ₃ NH ₃ ⁺¹	(HOCH ₂) ₃ NH ₂	8.075	8.41 x 10 ⁻⁹
water	H ₂ O	OH ⁻¹	13.996	1.01 x 10 ⁻¹⁴

*[H₂CO₃] for this value of K_a is actually [H₂CO₃(aq) + CO₂(aq)]

APPENDIX 5. PROPERTIES OF ACID-BASE INDICATORS

Indicator	Acid Color	Base Color	pK _a
thymol blue	red	yellow	1.7
methyl yellow	red	yellow	3.1
methyl orange	red	orange	3.7
bromophenol blue	yellow	blue	4.1
bromocresol green	yellow	blue	4.7
methyl red	red	yellow	5.0
bromocresol purple	yellow	purple	6.1
chlorophenol red	yellow	red	6.2
bromothymol blue	yellow	blue	7.1
phenol red	yellow	red	7.8
cresol red (1 st step)	red (pH < 0.2)	yellow (pH > 1.8)	–
cresol red (2 nd step)	yellow	red	8.2
thymol blue	yellow	blue	8.9
thymolphthalein	colorless	blue	9.2
phenolphthalein	colorless	red	9.6