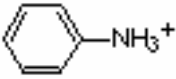

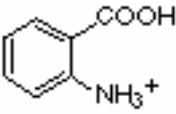
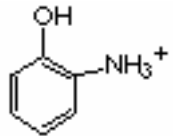
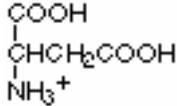
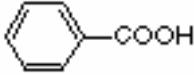
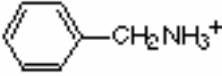
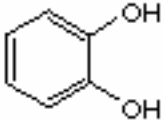
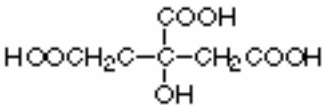
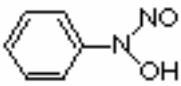
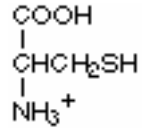
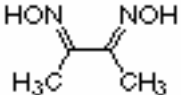
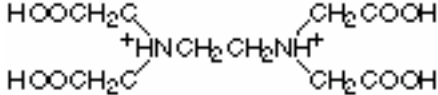
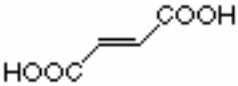
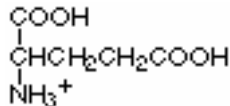
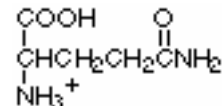
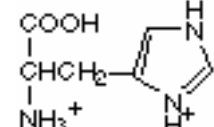
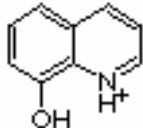
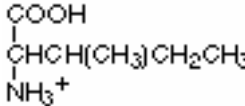
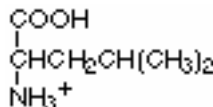
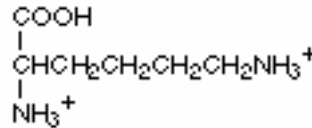

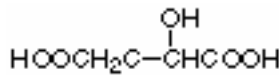


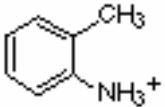
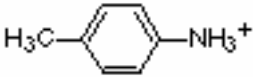
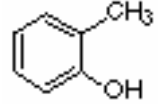

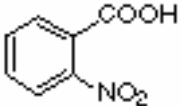
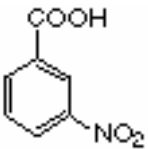
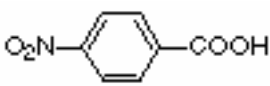
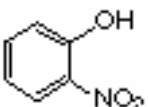
Acid Dissociation Equilibrium Constants (K_a) at 298.15 K

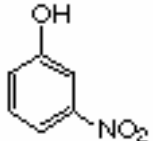

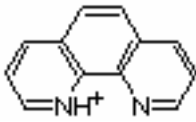
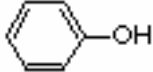
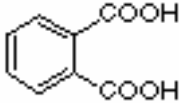
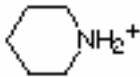
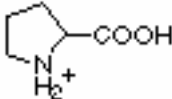
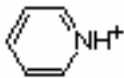
compound	conjugate acid	pK_a	K_a
acetic acid	CH_3COOH	4.757	1.75×10^{-5}
adipic acid	$\text{HOOC}(\text{CH}_2)_4\text{COOH}$	4.42 5.42	3.8×10^{-5} 3.8×10^{-6}
alanine	$\begin{array}{c} \text{COOH} \\ \\ \text{CHCH}_3 \\ \\ \text{NH}_3^+ \end{array}$	2.348 (COOH) 9.867 (NH ₃)	4.49×10^{-3} 1.36×10^{-10}
aminobenzene		4.601	2.51×10^{-5}
4-aminobenzene-sulfonic acid		3.232	5.86×10^{-4}
2-aminobenzoic acid		2.08 (COOH) 4.96 (NH ₃)	8.3×10^{-3} 1.1×10^{-5}
2-aminophenol		4.78 (NH ₃) ^a 9.97 (OH) ^a	1.7×10^{-5} 1.05×10^{-10}
ammonia	NH_4^+	9.244	5.70×10^{-10}
arginine	$\begin{array}{c} \text{COOH} \\ \\ \text{CHCH}_2\text{CH}_2\text{CH}_2\text{NHC} \begin{array}{l} \text{NH}_2^+ \\ \text{NH}_2 \end{array} \\ \\ \text{NH}_3^+ \end{array}$	1.823 (COOH) 8.991 (NH ₃) (12.48) (NH ₂)	1.50×10^{-2} 1.02×10^{-9} 3.3×10^{-13}
arsenic acid	H_3AsO_4	2.24 6.96 11.50	5.8×10^{-3} 1.1×10^{-7} 3.2×10^{-12}
asparagine	$\begin{array}{c} \text{COOH} \\ \\ \text{CHCH}_2\text{C} \begin{array}{l} \text{NH}_2 \\ \text{O} \end{array} \\ \\ \text{NH}_3^+ \end{array}$	2.14 (COOH) ^b 8.72 (NH ₃) ^b	7.2×10^{-3} 1.9×10^{-9}

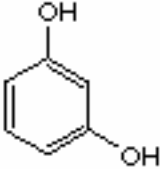
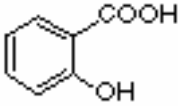
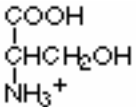
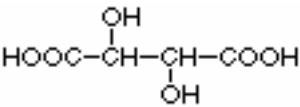
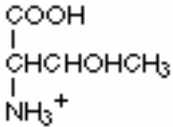
aspartic acid		1.990 (α -COOH)	1.02×10^{-2}
		3.900 (β -COOH)	1.26×10^{-4}
		10.002 (NH_3)	9.95×10^{-11}
benzoic acid		4.202	6.28×10^{-5}
benzylamine		9.35	4.5×10^{-10}
boric acid	H_3BO_3	9.236	5.81×10^{-10}
		(12.74) ^a	1.82×10^{-13}
		(13.80) ^a	1.58×10^{-14}
carbonic acid	H_2CO_3	6.352	4.45×10^{-7}
		10.329	4.69×10^{-11}
catechol		9.40	4.0×10^{-10}
		12.8	1.6×10^{-13}
chloroacetic acid	ClCH_2COOH	2.865	1.36×10^{-3}
chromic acid	H_2CrO_4	-0.2 ^a	1.6
		6.51	3.1×10^{-7}
citric acid		3.128 (COOH)	7.45×10^{-4}
		4.761 (COOH)	1.73×10^{-5}
		6.396 (COOH)	4.02×10^{-7}
cupferron		4.16 ^b	6.9×10^{-5}
cysteine		(1.71) (COOH)	1.9×10^{-2}
		8.36 (SH)	4.4×10^{-9}
		10.77 (NH_3)	1.7×10^{-11}
dichloroacetic acid	Cl_2CHCOOH	1.30	5.0×10^{-2}
diethylamine	$(\text{CH}_3\text{CH}_2)_2\text{NH}_2^+$	10.933	1.17×10^{-11}

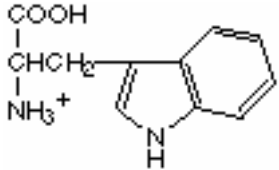
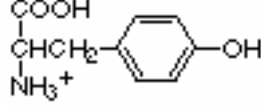
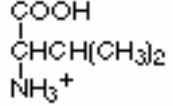
dimethylamine	$(\text{CH}_3)_2\text{NH}_2^+$	10.774	1.68×10^{-11}
dimethylglyoxime		10.66	2.2×10^{-11}
		12.0	1×10^{-12}
ethylamine	$\text{CH}_3\text{CH}_2\text{NH}_3^+$	10.636	2.31×10^{-11}
ethylenediamine	$^+\text{H}_3\text{NCH}_2\text{CH}_2\text{NH}_3^+$	6.848	1.42×10^{-7}
		9.928	1.18×10^{-10}
ethylenediamine-tetraacetic acid (EDTA)		0.0 (COOH) ^b	1.0
		1.5 (COOH) ^b	3.2×10^{-2}
		2.0 (COOH) ^b	1.0×10^{-2}
		2.68 (COOH) ^b	2.1×10^{-3}
		6.11 (NH) ^b	7.8×10^{-7}
		10.17 (NH) ^b	6.8×10^{-11}
formic acid	HCOOH	3.745	1.80×10^{-4}
fumaric acid		3.053	8.85×10^{-4}
		4.494	3.21×10^{-5}
glutamic acid		2.23 (α-COOH)	5.9×10^{-3}
		4.42 (λ-COOH)	3.8×10^{-5}
		9.95 (NH ₃)	1.12×10^{-10}
glutamine		2.17 (COOH) ^b	6.8×10^{-3}
		9.01 (NH ₃) ^b	9.8×10^{-10}
glycine	$^+\text{H}_3\text{NCH}_2\text{COOH}$	2.350 (COOH)	4.47×10^{-3}
		9.778 (NH ₃)	1.67×10^{-10}
glycolic acid	HOCH ₂ COOH	3.831 (COOH)	1.48×10^{-4}
histidine		1.7 (COOH) ^b	2×10^{-2}
		6.02 (NH) ^b	9.5×10^{-7}
		9.08 (NH ₃) ^b	8.3×10^{-10}

hydrogen cyanide	HCN	9.21	6.2×10^{-10}
hydrogen fluoride	HF	3.17	6.8×10^{-4}
hydrogen peroxide	H ₂ O ₂	11.65	2.2×10^{-12}
hydrogen sulfide	H ₂ S	7.02	9.5×10^{-8}
		13.9	1.3×10^{-14}
hydrogen thiocyanate	HSCN	0.9	1.3×10^{-1}
8-hydroxyquinoline		4.91 (NH) 9.81 (OH)	1.23×10^{-5} 1.55×10^{-10}
hydroxylamine	HONH ₃ ⁺	5.96	1.1×10^{-6}
hypobromous	HOBr	8.63	2.3×10^{-9}
hypochlorous	HOCl	7.53	3.0×10^{-8}
hypoiodous	HOI	10.64	2.3×10^{-11}
iodic acid	HIO ₃	0.77	1.7×10^{-1}
isoleucine		2.319 (COOH) 9.754 (NH ₃)	4.80×10^{-3} 1.76×10^{-10}
leucine		2.329 (COOH) 9.747 (NH ₃)	4.69×10^{-3} 1.79×10^{-10}
lysine		2.04 (COOH) ^b 9.08 (α-NH ₃) ^b 10.69 (ε-NH ₃) ^b	9.1×10^{-3} 8.3×10^{-10} 2.0×10^{-11}
maleic acid		1.910 6.332	1.23×10^{-2} 4.66×10^{-7}
malic acid		3.459 (COOH) 5.097 (COOH)	3.48×10^{-4} 8.00×10^{-6}

malonic acid	HOOCCH ₂ COOH	2.847 5.696	1.42 × 10 ⁻³ 2.01 × 10 ⁻⁶
methionine	$\begin{array}{c} \text{COOH} \\ \\ \text{CHCH}_2\text{CH}_2\text{SCH}_3 \\ \\ \text{NH}_3^+ \end{array}$	2.20 (COOH) ^b 9.05 (NH ₃) ^b	6.3 × 10 ⁻³ 8.9 × 10 ⁻¹⁰
methylamine	CH ₃ NH ₃ ⁺	10.64	2.3 × 10 ⁻¹¹
2- methylaniline		4.447	3.57 × 10 ⁻⁵
4-methylaniline		5.084	8.24 × 10 ⁻⁶
2-methylphenol		10.28	5.2 × 10 ⁻¹¹
4-methylphenol		10.26	5.5 × 10 ⁻¹¹
nitrilotriacetic acid	$\begin{array}{c} \text{CH}_2\text{COOH} \\ \\ \text{}^+\text{HN}-\text{CH}_2\text{COOH} \\ \\ \text{CH}_2\text{COOH} \end{array}$	1.1 (COOH) ^{a,b} 1.650 (COOH) ^a 2.940 (COOH) ^a 10.334 (NH ₃) ^a	8 × 10 ⁻² 2.24 × 10 ⁻² 1.15 × 10 ⁻³ 4.63 × 10 ⁻¹¹
2-nitrobenzoic acid		2.179	6.62 × 10 ⁻³
3-nitrobenzoic acid		3.449	3.56 × 10 ⁻⁴
4-nitrobenzoic acid		3.442	3.61 × 10 ⁻⁴
2-nitrophenol		7.21	6.2 × 10 ⁻⁸

3-nitrophenol		8.39	4.1×10^{-9}
4-nitrophenol		7.15	7.1×10^{-8}
nitrous acid	HNO_2	3.15	7.1×10^{-4}
oxalic acid	$\text{H}_2\text{C}_2\text{O}_4$	1.252	5.60×10^{-2}
		4.266	5.42×10^{-5}
1,10-phenanthroline		4.86	1.38×10^{-5}
phenol		9.98	1.05×10^{-10}
phenylalanine	$\begin{array}{c} \text{COOH} \\ \\ \text{CHCH}_2\text{C}_6\text{H}_5 \\ \\ \text{NH}_3^+ \end{array}$	2.20 (COOH)	6.3×10^{-3}
		9.31 (NH ₃)	4.9×10^{-10}
phosphoric acid	H_3PO_4	2.148	7.11×10^{-3}
		7.199	6.32×10^{-8}
		12.35	4.5×10^{-13}
phthalic acid		2.950	1.12×10^{-3}
		5.408	3.91×10^{-6}
piperidine		11.123	7.53×10^{-12}
proline		1.952 (COOH)	1.12×10^{-2}
		10.640 (NH)	2.29×10^{-11}
propanoic acid	$\text{CH}_3\text{CH}_2\text{COOH}$	4.874	1.34×10^{-5}
propylamine	$\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_3^+$	10.566	2.72×10^{-11}
pyridine		5.229	5.90×10^{-6}

resorcinol		9.30 11.06	5.0×10^{-10} 8.7×10^{-12}
salicylic acid		2.97 (COOH) 13.74 (OH)	1.07×10^{-3} 1.8×10^{-14}
serine		2.187 (COOH) 9.209 (NH ₃)	6.50×10^{-3} 6.18×10^{-10}
succinic acid	HOOCCH ₂ CH ₂ COOH	4.207 5.636	6.21×10^{-5} 2.31×10^{-6}
sulfuric acid	H ₂ SO ₄	strong 1.99	strong 1.0×10^{-2}
sulfurous acid	H ₂ SO ₃	1.91 7.18	1.2×10^{-2} 6.6×10^{-8}
D-tartaric acid		3.036 (COOH) 4.366 (COOH)	9.20×10^{-4} 4.31×10^{-5}
threonine		2.088 (COOH) 9.100 (NH ₃)	8.17×10^{-3} 7.94×10^{-10}
thiosulfuric acid	H ₂ S ₂ O ₃	0.6 1.6	3×10^{-1} 3×10^{-2}
trichloroacetic acid	Cl ₃ CCOOH	0.66 ^b	2.2×10^{-1}
triethanolamine	(HOCH ₂ CH ₂) ₃ NH ⁺	7.762	1.73×10^{-8}
triethylamine	(CH ₃ CH ₂) ₃ NH ⁺	10.715	1.93×10^{-11}
trimethylamine	(CH ₃) ₃ NH ⁺	9.800	1.58×10^{-10}
tris(hydroxymethyl) -aminomethane (TRIS or THAM)	(HOCH ₂) ₃ CNH ₃ ⁺	8.075	8.41×10^{-9}

tryptophan		2.35 (COOH) ^b	4.5×10^{-3}
		9.33 (NH ₃) ^b	4.7×10^{-10}
tyrosine		2.17 (COOH) ^b	6.8×10^{-3}
		9.19 (NH ₃)	6.5×10^{-10}
		10.47 (OH)	3.4×10^{-11}
valine		2.286 (COOH)	5.18×10^{-3}
		9.718 (OH)	1.91×10^{-10}

All values are from Martell, A. E.; Smith, R. M. *Critical Stability Constants*, Vol. 1 - 4, Plenum Press: New York, 1976. Unless otherwise stated, values are for 25°C and zero ionic strength. Values in parentheses are considered less reliable.

^a Temperature of 20°C

^b Ionic Strength of 0.1 M