

Appendix B AQUEOUS EQUILIBRIUM CONSTANTS

Acid Dissociation constants, K_a

Name	Formula	Alternate	(Step)	K_a
acetic acid	CH ₃ CO ₂ H	CH ₃ C(O)OH		1.8×10^{-5}
arsenic acid	H ₃ AsO ₄	OAs(OH) ₃	(1) (2) (3)	4.9×10^{-3} 8.9×10^{-8} 3.2×10^{-12}
benzoic acid	C ₆ H ₅ CO ₂ H	C ₆ H ₅ C(O)OH		6.3×10^{-5}
butyric acid	C ₃ H ₇ CO ₂ H	C ₃ H ₇ C(O)OH		1.5×10^{-5}
carbon dioxide	CO ₂		(1) (2)	4.5×10^{-7} 4.7×10^{-11}
chloroacetic acid	ClCH ₂ CO ₂ H	ClCH ₂ C(O)OH		1.4×10^{-3}
chlorous acid	HClO ₂	OCIOH		1.1×10^{-2}
citric acid	C ₆ H ₈ O ₇	C ₃ H ₄ OH(C(O)OH) ₃	(1) (2) (3)	7.4×10^{-4} 1.7×10^{-5} 4.0×10^{-7}
dichloroacetic acid	Cl ₂ CHCO ₂ H	Cl ₂ CHC(O)OH		5.0×10^{-2}
dimethylphosphinic acid	(CH ₃) ₂ PO ₂ H	(CH ₃) ₂ P(O)OH		8.3×10^{-4}
formic acid	HCO ₂ H	HC(O)OH		1.8×10^{-4}
hydrocyanic acid	HCN			6.2×10^{-10}
hydrofluoric acid	HF			6.8×10^{-4}
hydrosulfuric acid	H ₂ S		(1) (2)	9.6×10^{-8} $\sim 10^{-17}$
hypobromous acid	HBrO	BrOH		2.3×10^{-9}
hypochlorous acid	HClO	ClOH		3.0×10^{-8}
hypoiodous acid	HIO	IOH		2.3×10^{-11}
iodic acid	HIO ₃	O ₂ IOH		1.7×10^{-1}
nitrous acid	HNO ₂	ONOH		7.1×10^{-4}
oxalic acid	H ₂ C ₂ O ₄	HO(O)CC(O)OH	(1) (2)	5.4×10^{-2} 5.4×10^{-5}
phosphoric acid	H ₃ PO ₄	OP(OH) ₃	(1) (2) (3)	7.1×10^{-3} 6.3×10^{-8} 4.5×10^{-13}
pyruvic acid	C ₃ H ₃ O ₃ H	CH ₃ C(O)C(O)OH		2.8×10^{-3}
selenous acid	H ₂ SeO ₃	OSe(OH) ₂	(1) (2)	2.4×10^{-3} 4.8×10^{-9}
sulfur dioxide	SO ₂		(1) (2)	1.4×10^{-2} 6.7×10^{-8}
sulfuric acid	H ₂ SO ₄	O ₂ S(OH) ₂	(2)	1.0×10^{-2}

Base Dissociation Constants, K_b

Name	Formula	Alternate	K_b
ammonia	NH ₃		1.8×10^{-5}
aniline	C ₆ H ₅ NH ₂		4.0×10^{-10}
ethanolamine	HOC ₂ H ₄ NH ₂	HOCH ₂ CH ₂ NH ₂	3.1×10^{-5}
ethylamine	C ₂ H ₅ NH ₂	CH ₃ CH ₂ NH ₂	4.3×10^{-4}
hydrazine	N ₂ H ₄	H ₂ NNH ₂	1.0×10^{-6}
hydroxylamine	HONH ₂		9.1×10^{-9}
imidazole	C ₃ H ₄ N ₂		9.8×10^{-8}
methylamine	CH ₃ NH ₂		4.4×10^{-4}
piperidine	C ₅ H ₁₀ NH		1.3×10^{-3}
pyridine	C ₅ H ₅ N		1.7×10^{-9}
triethylamine	(C ₂ H ₅) ₃ N	(CH ₃ CH ₂) ₃ N	5.2×10^{-4}

Solubility Products, K_{sp}

Name	Formula	K_{sp}	Name	Formula	K_{sp}
barium chromate	BaCrO ₄	1.2×10^{-10}	lead(II) chloride	PbCl ₂	1.7×10^{-5}
barium fluoride	BaF ₂	1.8×10^{-7}	lead(II) chromate	PbCrO ₄	2.8×10^{-13}
barium sulfate	BaSO ₄	1.1×10^{-10}	lead(II) iodate	Pb(IO ₃) ₂	3.7×10^{-13}
cadmium hydroxide	Cd(OH) ₂	7.2×10^{-15}	lead(II) sulfate	PbSO ₄	2.5×10^{-8}
calcium carbonate	CaCO ₃	3.4×10^{-9}	magnesium fluoride	MgF ₂	5.2×10^{-11}
calcium iodate	Ca(IO ₃) ₂	6.5×10^{-6}	mercury(II) iodate	Hg(IO ₃) ₂	3.2×10^{-13}
calcium sulfate	CaSO ₄	4.9×10^{-5}	silver bromide	AgBr	5.4×10^{-13}
copper(I) bromide	CuBr	6.3×10^{-9}	silver carbonate	Ag ₂ CO ₃	8.5×10^{-12}
copper(I) chloride	CuCl	1.7×10^{-7}	silver chloride	AgCl	1.8×10^{-10}
copper(I) iodide	CuI	1.3×10^{-12}	silver iodide	AgI	8.5×10^{-17}
gold(I) chloride	AuCl	2.0×10^{-13}	silver oxalate	Ag ₂ C ₂ O ₄	5.4×10^{-12}
iron(II) carbonate	FeCO ₃	3.1×10^{-11}	silver sulfate	Ag ₂ SO ₄	1.2×10^{-5}
iron(II) hydroxide	Fe(OH) ₂	4.9×10^{-17}	zinc carbonate	ZnCO ₃	1.5×10^{-5}

Complex Formation Constants, K_f

Formula	K_f	Formula	K_f
Ag(NH ₃) ₂ ⁺	1.1×10^7	Cu(NH ₃) ₄ ²⁺	2.1×10^{13}
Ag(SCN) ₄ ³⁻	1.2×10^{10}	Fe(CN) ₆ ⁴⁻	7.9×10^{36}
Ag(S ₂ O ₃) ₂ ³⁻	2.9×10^{13}	HgBr ₄ ²⁻	1.0×10^{21}
AlF ₆ ³⁻	6.9×10^{19}	HgCl ₄ ²⁻	1.2×10^{15}
Al(OH) ₄ ⁻	1.1×10^{33}	Ni(NH ₃) ₆ ²⁺	5.5×10^8
Cd(CN) ₄ ²⁻	6.0×10^{18}	Zn(NH ₃) ₄ ²⁺	2.9×10^9
Cu(CN) ₄ ³⁻	2.0×10^{30}	Zn(OH) ₄ ²⁻	4.6×10^{17}