Appendix B AQUEOUS EQUILIBRIUM CONSTANTS

12/3/11

Acid Dissociation constants, K_a

Name	Formula	Alternate	(Step)	K_a
acetic acid	CH_3CO_2H	$CH_3C(O)OH$		1.8×10^{-5}
arsenic acid	H_3AsO_4	$OAs(OH)_3$	(1)	4.9×10^{-3}
			(2)	8.9×10^{-8}
			(3)	3.2×10^{-12}
benzoic acid	$C_6H_5CO_2H$	$C_6H_5C(O)OH$		6.3×10^{-5}
butyric acid	$C_3H_7CO_2H$	$C_3H_7C(O)OH$		1.5×10^{-5}
carbon dioxide	CO_2		(1)	4.5×10^{-7}
			(2)	4.7×10^{-11}
chloroacetic acid	$ClCH_2CO_2H$	$ClCH_2C(O)OH$		1.4×10^{-3}
chlorous acid	$HClO_2$	$OClOH$		1.1×10^{-2}
citric acid	$C_6H_8O_7$	$C_3H_4OH(C(O)OH)_3$	(1)	7.4×10^{-4}
			(2)	1.7×10^{-5}
			(3)	4.0×10^{-7}
dichloroacetic acid	Cl_2CHCO_2H	$Cl_2CHC(O)OH$		5.0×10^{-2}
dimethylphosphinic acid	$(CH_3)_2PO_2H$	$(CH_3)_2P(O)OH$		8.3×10^{-4}
formic acid	HCO_2H	$HC(O)OH$		1.8×10^{-4}
hydrocyanic acid	HCN			6.2×10^{-10}
hydrofluoric acid	HF			6.8×10^{-4}
hydrosulfuric acid	H_2S		(1)	9.6×10^{-8}
			(2)	$\sim 10^{-17}$
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_2IOH		1.7×10^{-1}
nitrous acid	HNO_2	$ONOH$		7.1×10^{-4}
oxalic acid	$H_2C_2O_4$	$HO(O)CC(O)OH$	(1)	5.4×10^{-2}
			(2)	5.4×10^{-5}
phosphoric acid	H_3PO_4	$OP(OH)_3$	(1)	7.1×10^{-3}
			(2)	6.3×10^{-8}
			(3)	4.5×10^{-13}
pyruvic acid	$C_3H_4O_3$	$CH_3C(O)C(O)OH$		2.8×10^{-3}
selenous acid	H_2SeO_3	$OSe(OH)_2$	(1)	2.4×10^{-3}
			(2)	4.8×10^{-9}
sulfur dioxide	SO_2		(1)	1.4×10^{-2}
			(2)	6.7×10^{-8}
sulfuric acid	H_2SO_4	$O_2S(OH)_2$	(2)	1.0×10^{-2}

Base Dissociation Constants, K_b

Name	Formula	Alternate	K_b
ammonia	NH_3		1.8×10^{-5}
hydroxylamine	$HONH_2$		9.1×10^{-9}
methylamine	CH_3NH_2		4.4×10^{-4}
ethylamine	$C_2H_5NH_2$	$CH_3CH_2NH_2$	4.3×10^{-4}
diethylamine	$(C_2H_5)_2NH$	$(CH_3CH_2)_2NH$	8.6×10^{-4}
triethylamine	$(C_2H_5)_3N$	$(CH_3CH_2)_3N$	5.2×10^{-4}
pyridine	C_5H_5N		1.7×10^{-9}
piperidine	$C_5H_{10}NH$		1.3×10^{-3}
aniline	$C_6H_5NH_2$		4.0×10^{-10}
hydrazine	N_2H_4	H_2NNH_2	1.0×10^{-6}

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(I) chloride	Hg_2Cl_2	1.4×10^{-18}
calcium sulfate	$CaSO_4$	4.9×10^{-5}	mercury(II) iodate	$Hg(IO_3)_2$	3.2×10^{-13}
copper(I) bromide	$CuBr$	6.3×10^{-9}	silver bromide	$AgBr$	5.4×10^{-13}
copper(I) chloride	$CuCl$	1.7×10^{-7}	silver carbonate	Ag_2CO_3	8.5×10^{-12}
copper(I) iodide	CuI	1.3×10^{-12}	silver chloride	$AgCl$	1.8×10^{-10}
gold(I) chloride	$AuCl$	2.0×10^{-13}	silver iodide	AgI	8.5×10^{-17}
iron(II) carbonate	$FeCO_3$	3.1×10^{-11}	silver oxalate	$Ag_2C_2O_4$	5.4×10^{-12}
iron(II) hydroxide	$Fe(OH)_2$	4.9×10^{-17}	silver sulfate	Ag_2SO_4	1.2×10^{-5}

Complex Formation Constants, K_f

Formula	K_f	Formula	K_f
$Ag(NH_2)_2^+$	1.1×10^{7}	$Cu(NH_3)_4^{2+}$	2.1×10^{13}
$Ag(SCN)_4^{3-}$	1.2×10^{10}	$Hg(NH_3)_4^{2+}$	1.9×10^{19}
$Ag(S_2O_3)_2^{3-}$	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}	$Ni(CN)_4^{2-}$	1.7×10^{30}
$Cd(CN)_4^{2-}$	6.0×10^{18}	$Ni(NH_3)_6^{2+}$	5.5×10^{8}
$Cd(OH)_4^{2-}$	4.2×10^{8}	$Zn(NH_3)_4^{2+}$	2.9×10^{9}
$Cu(CN)_4^{3-}$	2.0×10^{30}	$Zn(OH)_4^{2-}$	4.6×10^{17}