3、HS^-既是酸又是碱

CO_3^{2-}是碱

$H_2PO_4^-$既是酸又是碱

NH_3是碱

H_2S是酸

HCl是酸

Ac^-是碱

OH^-是碱

H_2O是酸

5、$CH_3COOH(l) \rightleftharpoons CH_3COO^-_{(aq)} + H^+(aq)$

0.05　　0　　0

$0.05-x_1$　　x_1　　x_1

$0.01-x_2$　　x_2　　x_2

$K_a^\theta = \frac{x^2}{0.05-x} = \frac{x^2}{0.05}$　　$x_1 = \sqrt{0.05 \cdot K_a^\theta} = 9.38\times10^{-4}\ mol\cdot L^{-1}$，$pH=3$

$K_a^\theta = \frac{x_2^2}{0.01-x_2} = \frac{x_2^2}{0.01}$　　$x_2 = \sqrt{0.01 K_a^\theta} = 4.19\times10^{-4}\ mol\cdot L^{-1}$　$pH=3.37$

10.

$NH_4^+_{(aq)} + H_2O \rightleftharpoons NH_3\cdot H_2O_{(aq)} + H^+(aq)$，$K_a^\theta = \frac{K_w}{K_b^\theta} = 5.6\times10^{-10}$

$\frac{c(H^+)\,c(NH_3\cdot H_2O)}{c(NH_4^+)} = K_a^\theta$

$0.1-x$　　x　　x

$\frac{x^2}{0.1-x} = K_a^\theta = \frac{x^2}{0.1}$　　$x = \sqrt{0.1\cdot K_a^\theta} = 7.5\times10^{-6}\ mol\cdot L^{-1}$

12. $K_a^{\ominus}=1.8\times10^{-5}$

稀释至1L后

$C(NH_3\cdot H_2O)=0.01\ mol\cdot L^{-1}$

$pH=9.4 \Rightarrow C(OH^-)=\frac{K_w}{C(H^+)}=10^{-4.6}\ mol\cdot L^{-1}$

$NH_3H_2O \rightleftharpoons NH_4^+(aq)+OH^-(aq)$

$K_a=\frac{C(NH_4^+)\cdot C(OH^-)}{C(NH_3\cdot H_2O)} \rightarrow C(NH_4^+)=\frac{K_a\cdot C(NH_3\cdot H_2O)}{C(OH^-)}=7.2\times10^{-3}\ mol/L$

$n=CV=7.2\times10^{-3}\ mol$

$m=n\cdot M=385.2\ g.$

16. $AgCl(s) \rightleftharpoons Ag^+(aq)+Cl^-(aq)$

$C(Ag^+)\cdot C(Cl^-)$

$=S^2(AgCl)=K_{sp}$

$S=1.33\times10^{-5}\ mol\cdot L^{-1}$

$CaF_2(s) \rightleftharpoons Ca^{2+}(aq)+2F^-(aq)$

S S 2S

$K_{sp}=C(Ca^{2+})\cdot C^2(F^-)=4S^3$

$S(CaF_2)=3.31\times10^{-4}\ mol\cdot L^{-1}$

20. $M^{2+}+H_2Y^{2-}=MY+2H^+$

$n(M^{2+})=n(H_2Y)=0.01048\cdot14.2\times10^{-3}$

$C(M^{2+})=\frac{n(M^{2+})}{V(M^{2+})}=1.488\times10^{-3}\ mol\cdot L^{-1}$