

$$192.4 \quad K_a^\ominus = \frac{(10^{-5})^2}{0.01} = 10^{-8}$$

$$\alpha = \frac{10^{-5}}{0.01} = 0.1\%$$

稀释至体积2倍后:  $K_a^\ominus = 10^{-8}$

$$\frac{[C(H^+)]^2}{\frac{0.01}{2}} = 10^{-8}$$

$$C(H^+)^2 = 2 \times 10^{-10} \text{ mol/L}$$

$$C(H^+) = \sqrt{2} \times 10^{-5} \text{ mol/L}$$

$$pH = 5.15$$

$$\alpha = \frac{\sqrt{2} \times 10^{-5}}{\frac{0.01}{2}} = 0.14\%$$

$$6. \quad \frac{C^2 \alpha^2}{C - C \alpha} = K_a$$

$$\Rightarrow \frac{C \cdot \alpha^2}{1 - \alpha} = K_a$$

$$C = 0.1 \text{ mol/L}$$

$$\alpha = 1.3\%$$

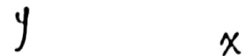
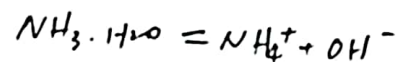
$$C = 0.05 \text{ mol/L}$$

$$\alpha = 1.1\%$$

$$12. \quad pH = 9.4$$

$$pOH = 4.6$$

$$C(OH^-) = 10^{-4.6} \text{ (mol/L)}$$



$$\frac{10^{-4.6} \cdot x}{y} = K^\ominus$$

$$pH = pK_a^\ominus + \lg \frac{n(NH_3)}{n(NH_4^+)}$$

$$9.4 = 14 + \lg(1.8 \times 10^{-5}) + \lg \frac{0.02 \times 0.5}{n(NH_4^+)}$$

$$n(NH_4Cl) = 0.0072 \text{ mol}$$

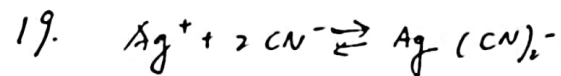
$$m = 0.0072 \times 53.5 = 0.39 \text{ g}$$

$$16. \quad S_1^2 = 1.77 \times 10^{-10}$$

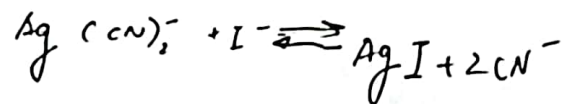
$$S_1 = 1.33 \times 10^{-5} \text{ (mol/L)}$$

$$S_2 \cdot (2S_2)^2 = K_2 = 1.46 \times 10^{-10}$$

$$S_2 = 3.32 \times 10^{-4} \text{ (mol/L)}$$



$$C(CN^-) = \frac{0.6 - 2 \times 0.2}{2} = 0.1 \text{ (mol/L)}$$



$$K = \frac{C(CN^-)^2}{[Ag(CN)_2^-]^2 \cdot C(I^-)}$$

$$= 8.3 \times 10^{-6}$$

$$J = \frac{C(CN^-)^2}{[Ag(CN)_2^-]^2 \cdot C(I^-)}$$

$$= \frac{0.1^2}{0.1 \times 0.1} = 1 > K$$

不能产生 AgI 沉淀

$$\frac{C(CN^-)^2}{0.1 \times 0.1} < 8.3 \times 10^{-6}$$

$$\therefore C(CN^-) < 2.9 \times 10^{-4} \text{ (mol/L)}$$



$$21. \quad c(\text{AgNO}_3) = 0.1 \times \frac{100}{200} = 0.05 (\text{mol/L})$$

$$c(\text{NH}_3) = \frac{60 \times 0.923 \times 0.183}{17 \times 200 \times 10^{-3}} = 2.98 (\text{mol/L})$$



$$0.05 \qquad \qquad 2.98 - 2 \times 0.05$$

$$0.05 - x \qquad x \qquad 2.98 - 2 \times 0.05 + 2x$$

$$\frac{1}{1.1 \times 10^7} = \frac{x(2.98 - 2 \times 0.05 + 2x)}{0.05 - x}$$

$$x = 5.5 \times 10^{-10} (\text{mol/L})$$

$$\therefore c(\text{Ag}^+) = 5.5 \times 10^{-10} (\text{mol/L})$$

$$c([\text{Ag}(\text{NH}_3)_2]^+) = 0.05 \text{ mol/L}$$

$$c(\text{NH}_3) = 2.88 (\text{mol/L})$$

$$(2) \quad c(\text{KCl}) = 0.1 \times \frac{20}{200+20} = 9.09 \times 10^{-3} (\text{mol/L})$$



$$K = \frac{1}{1.1 \times 10^7 \times 1.77 \times 10^{-10}} = 5.1 \times 10^2$$

$$J = \frac{c(\text{NH}_3)^2}{c([\text{Ag}(\text{NH}_3)_2]^+) \cdot c(\text{Cl}^-)} \therefore c(\text{NH}_3) < 0.48 (\text{mol/L})$$

$$= 1.82 \times 10^4 > K$$

不能产生 AgCl 沉淀

$$\frac{c(\text{NH}_3)^2}{0.05 \times 9.09 \times 10^{-3}} < 5.1 \times 10^2$$

