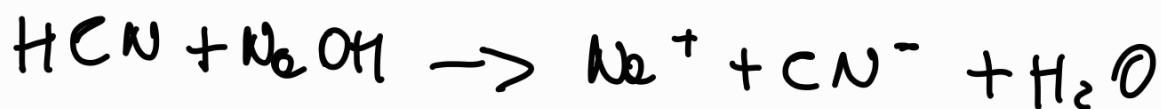
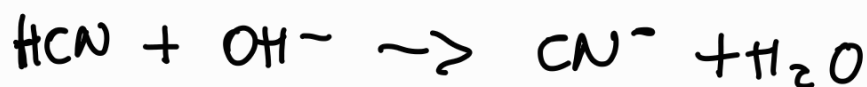


④



IONICA NETTA



$n_{\text{HCN}} \rightarrow 10 \text{ mL di HCN } 0.10 \text{ M}$

DA CUI:

$$M_{\text{HCN}} = 0.10 \cdot 10 \cdot 10^{-3} = 0.001 \text{ mol}$$

$n_{\text{NaOH}} \rightarrow 10 \text{ mL di NaOH } 0.025 \text{ M}$

DA CUI:

$$M_{\text{NaOH}} = M_{\text{OH}^-} = 0.025 \cdot 10 \cdot 10^{-3} \\ = 0.00025 \text{ moli}$$

OH^- REAGENTE LIMITANTE QUINDI A REAZ.

CONCLUSA:

$$M_{\text{HCN}} = 0.001 - 0.00025 = 0.00075 \text{ moli}$$

$$n_{\text{CN}^-} = M_{\text{OH}^-} = 0.00025 \text{ moli}$$

$$V_{\text{finale}} = 10 + 10 = 20 \text{ mL}$$

$$[CN^-] = 0.00025 / 20 \cdot 10^{-3} = 0.0125 \text{ M}$$

$$[HCN] = 0.00075 / 20 \cdot 10^{-3} = 0.0375 \text{ M}$$

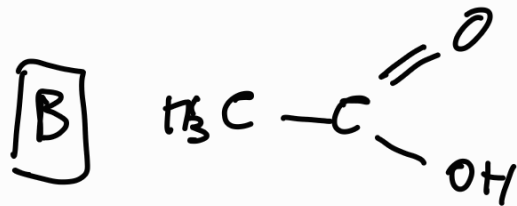
$$pH = pK_a + \log \frac{[CN^-]}{[HCN]} = \underline{\underline{9.52}}$$

[D]

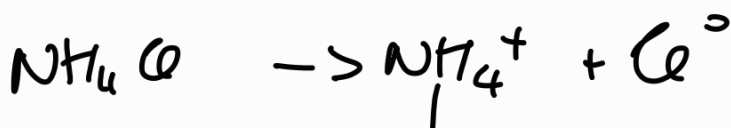
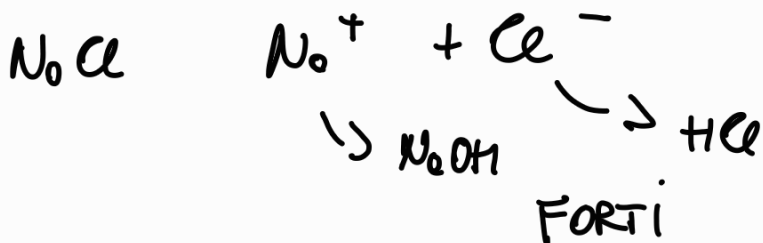
②

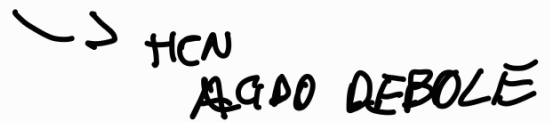
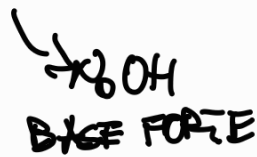
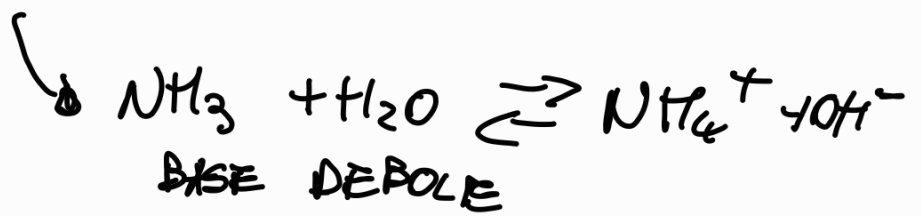
$$\begin{aligned} [H_3O^+] &= \sqrt{K_a \cdot C_0} \\ &= \sqrt{1.8 \cdot 10^{-5} \cdot 0.13} \\ &= 0.0164 \text{ M} \end{aligned}$$

$$pH = 2.76$$



③





c, b, d



④

$$m_{\text{Cl}^-} = m_{\text{NaCl}} = \frac{10 \cdot 10^{-3}}{58.44} = 0.00017 \text{ mol/l}$$

$$[\text{Cl}^-] = \frac{0.00017}{100 \cdot 10^{-3}} = 0.0017 \text{ M}$$

$$Q(\text{AgCl}) = [\text{Ag}^+] [\text{Cl}^-] = 0.10 \cdot 0.0017 = 1.7 \cdot 10^{-4}$$

$$Q(\text{AgCl}) > K_{ps}(\text{AgCl}) \quad \underline{\text{PRECIPITA}}$$

$> 1.1 \cdot 10^{-10}$

$$Q(\text{PbCl}_2) = [\text{Pb}^{2+}] [\text{Cl}^-]^2 = 0.1 \cdot (0.0017)^2$$

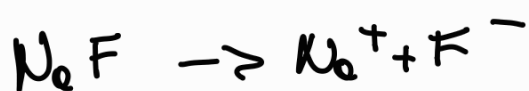
$$= 2.89 \cdot 10^{-9}$$

$$Q(\text{PbCl}_2) < K_{\text{ps}}(\text{PbCl}_2) \quad \underline{\text{NO PRECIPITA}}$$

$$\hookrightarrow 1.4 \cdot 10^{-4}$$

A

⑥



$$K_b = K_w / K_a = 10^{-14} / 1.7 \cdot 10^{-4} = 5.9 \cdot 10^{-11}$$

$$[\text{OH}^-] = \sqrt{K_b \cdot [\text{F}^-]}$$

$$n_{\text{F}^-} = n_{\text{NaF}} = \frac{5.6}{(19 + 23)} = 0.13 \text{ mol}$$

$$[\text{F}^-] = \frac{0.13}{0.5} = 0.26 \text{ M}$$

$$[\text{OH}^-] = 3.97 \cdot 10^{-6} \text{ M}$$

$$\text{pH} = 8.6$$

D

7

$$pH = pK_e + \log \frac{[CN^-]}{[HCN]}$$

$$\frac{[CN^-]}{[HCN]} = 10^{pH - pK_e} = 10^{10.1 - 9.4} = 5.01$$

B

8

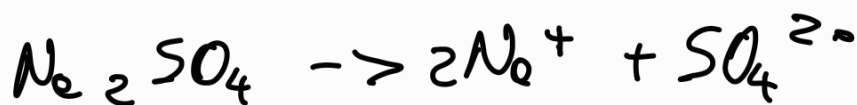
DIMINUISCE PER LA LEGAME H-X CAUSA
DIMENSIONE ALOGENO

B

9



$$[SO_4^{2-}] = 0.25 M$$



$$K_{ps} = [Re^{2+}] [SO_4^{2-}]$$

$$[Re^{2+}] = s = \frac{K_{ps}}{[SO_4^{2-}]} =$$

$$= 4.2 \cdot 10^{-11} / 0.25 = 1.68 \cdot 10^{-10} M$$

A