

II^o ESONERO 14/12/2022

$$(1) \quad \frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$V_1 = 5,3 \text{ L}$$

$$P_1 = \frac{8,81 \cdot 10^4 \text{ Pa}}{101.325} = 0,879 \text{ atm}$$

$$V_2 = x$$

$$P_2 = 1,13 \text{ atm}$$

$$T_1 = 383,5 \text{ K}$$

$$T_2 = 352 \text{ K}$$

$$\frac{0,879 \cdot 5,3}{383,5} = \frac{1,13 \cdot x}{352}$$

$$x = V_2 = 3,784 \text{ L}$$

$$m = V \cdot d = 3,784 \text{ L} \times 0,912 \text{ g/L} = \underline{3,45 \text{ g}}$$

$$(2) \quad \Delta t_e = K_e \cdot m \longrightarrow \text{MOLALITA'}$$

$$\begin{aligned} \Delta T_{\text{soluzione}} - T_{\text{solvente}} &= 100,354 - 100 = \\ &= 0,354 \text{ }^\circ\text{C} \end{aligned}$$

$$m = \frac{\Delta T_e}{K_e} = \frac{0,354 \text{ }^\circ\text{C}}{0,513 \text{ }^\circ\text{C kg/mol}} = 0,69 \text{ mol/kg}$$

$$m = \frac{q}{M_e \cdot b} \cdot 1000 \Rightarrow M_e = \frac{q}{m \cdot b} \cdot 1000 =$$

$$= \frac{1}{0,69 \cdot 25} \cdot 1000 = \underline{57,97 \text{ g}}$$

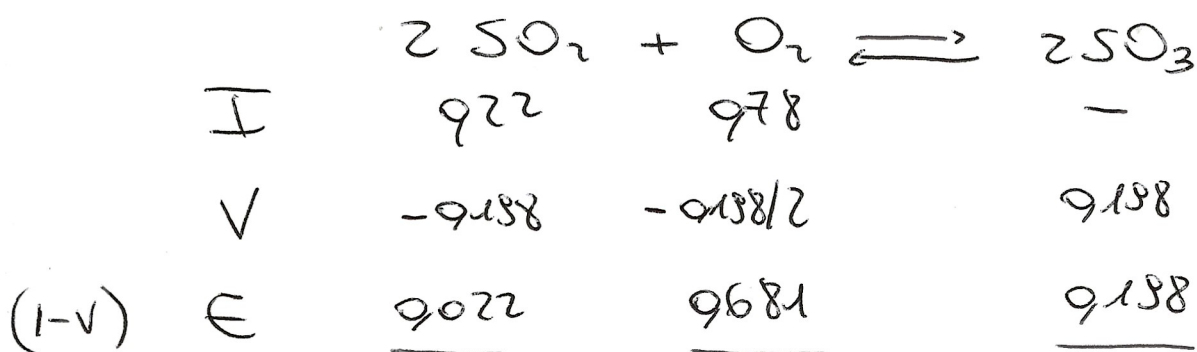
$$\begin{aligned} q &= \text{g soluto} \\ M_e &= \text{peso mole. di soluto} \\ b &= \text{g solvente} \end{aligned}$$

③ MOLI INIZIALI DI SO_2

22% $\rightarrow$ 9,22 mol

MOLI INIZIALI DI O_2

18% $\rightarrow$ 9,78 mol



DI SO_3

SI FORMANO IL 80% DI MOLI DI SO_2

QUINDI

$$n_{\text{SO}_3} = 9,22 \times 0,8 = \underline{9,188}$$

$$n_{\text{TOTALE}} = 9,022 + 9,681 + 9,188 = 9,891$$

PRESSIONI PARZIALI $P_i = X_i \cdot P_{\text{TOTALE}}$

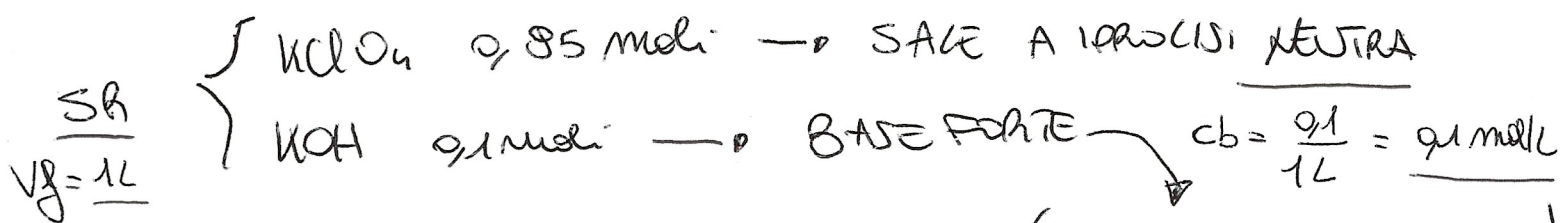
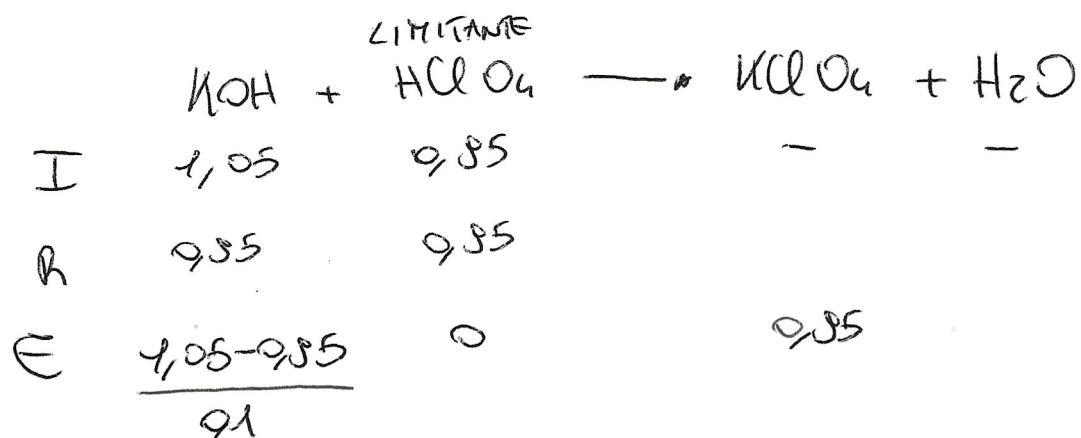
$$P_{\text{O}_2} = \frac{9,681}{9,891} \times 3 = 2,26 \text{ atm}$$

$$P_{\text{SO}_2} = \frac{9,022}{9,891} \times 3 = 9,023 \text{ atm}$$

$$P_{\text{SO}_3} = \frac{9,188}{9,891} \times 3 = 9,66 \text{ atm}$$

$$K_p = \frac{(P_{\text{SO}_3})^2}{(P_{\text{SO}_2})^2 \times P_{\text{O}_2}} = \frac{9,66^2}{9,023^2 \times 2,26} = \underline{36,13 \text{ atm}^{-1}}$$

4) $n_{KOH} \text{ di } KOH = M \times V = 2,1 \times 95 \text{ L} = 1,95$
 $n_{HClO_4} \text{ di } HClO_4 = M \times V = 1,8 \times 95 = 0,85$



$$pOH = -\log(c_b) = -\log 0,1 = 1 \quad \left(KOH \longrightarrow K^+ + OH^- \right)$$

$$pH = 14 - 1 = \underline{13}$$