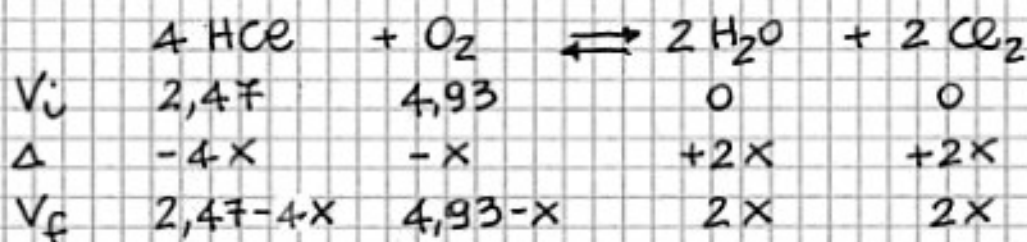


A pressione costante, il volume di una data massa di gas varia linearmente al variare della temperatura (legge isobara di Charles):

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$V_2 \text{ HCl} = \frac{1,00 \text{ dm}^3 \cdot 673 \text{ K}}{273 \text{ K}} = 2,47 \text{ dm}^3$$

$$V_2 \text{ O}_2 = \frac{2,00 \text{ dm}^3 \cdot 673 \text{ K}}{273 \text{ K}} = 4,93 \text{ dm}^3$$



$$V_f \text{ Cl}_2 = V_f \text{ H}_2\text{O} = 2x = 1,05 \text{ dm}^3$$

$$x = 0,525 \text{ dm}^3$$

$$V_f \text{ HCl} = 2,47 - 4 \cdot 0,525 = 0,365 \text{ dm}^3$$

$$V_f \text{ O}_2 = 4,93 - 0,525 = 4,405 \text{ dm}^3$$

$$V_f \text{ totale} = 6,87 \text{ dm}^3$$

$$1 \text{ atm} = 1,01325 \text{ bar}$$

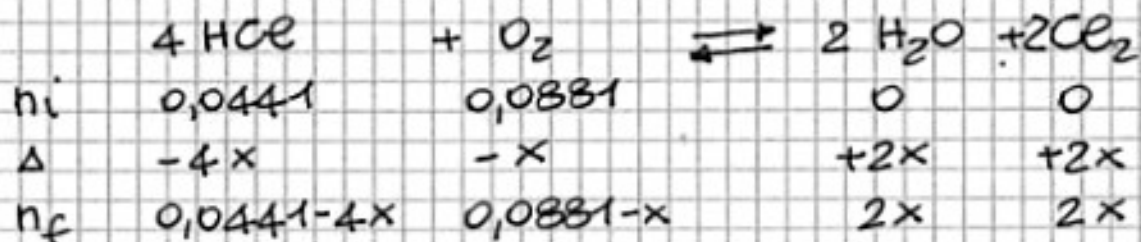
$$R = 0,08206 \frac{\text{L} \cdot \text{atm}}{\text{K} \cdot \text{mol}} = 0,08315 \frac{\text{dm}^3 \cdot \text{bar}}{\text{K} \cdot \text{mol}}$$

$$P_{\text{tot}} = 1,01 \cdot 10^5 \text{ Pa} = 1,01 \text{ bar}$$

$$n_{\text{tot}} = \frac{1,01 \cdot 6,87}{0,08315 \cdot 673} = 0,124 \text{ mol}$$

$$n_i \text{ HCl} = \frac{1,00 \text{ dm}^3 \cdot 1 \text{ bar}}{0,08315 \frac{\text{dm}^3 \cdot \text{bar}}{\text{K} \cdot \text{mol}} \cdot 273 \text{ K}} = 0,441 \text{ mol}$$

$$n_i \text{ O}_2 = \frac{2,00 \text{ dm}^3 \cdot 1 \text{ bar}}{0,08315 \frac{\text{dm}^3 \cdot \text{bar}}{\text{K} \cdot \text{mol}} \cdot 273 \text{ K}} = 0,881 \text{ mol}$$



$$n_{\text{tot}} = 0,132 - x$$

$$0,124 = 0,132 - x$$

$$x = 0,0082 \text{ mol}$$

$$n_f \text{HCl} = 0,0441 - 4 \cdot 0,0082 = 0,0114 \text{ mol}$$

$$n_f \text{O}_2 = 0,0881 - 0,0082 = 0,0800 \text{ mol}$$

$$n_f \text{H}_2\text{O} = n_f \text{Cl}_2 = 2 \cdot 0,0082 = 0,0163 \text{ mol}$$

$$X_{\text{HCl}} = 0,0114 \text{ mol} / 0,124 \text{ mol} = 0,0922$$

$$X_{\text{O}_2} = 0,0800 \text{ mol} / 0,124 \text{ mol} = 0,645$$

$$X_{\text{H}_2\text{O}} = X_{\text{Cl}_2} = 0,0163 \text{ mol} / 0,124 \text{ mol} = 0,131$$

$$P_{\text{HCl}} = 0,0922 \cdot 1,01 \text{ bar} = 0,0932 \text{ bar}$$

$$P_{\text{O}_2} = 0,645 \cdot 1,01 \text{ bar} = 0,651 \text{ bar}$$

$$P_{\text{H}_2\text{O}} = P_{\text{Cl}_2} = 0,131 \cdot 1,01 \text{ bar} = 0,133 \text{ bar}$$

$$K_p = \frac{P_{\text{H}_2\text{O}}^2 \cdot P_{\text{Cl}_2}^2}{P_{\text{HCl}}^4 \cdot P_{\text{O}_2}} = \frac{0,133^2 \cdot 0,133^2}{0,0932^4 \cdot 0,651} = 6,35$$

???