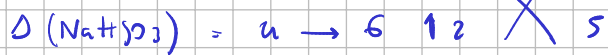
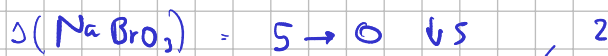
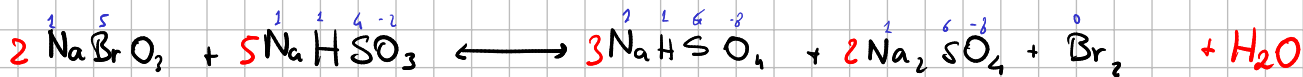


ESAME PROVA

es 1



- $\overset{5}{\text{H}} \overset{5}{\text{Br}} \overset{0}{\text{O}_3}$ acido bromico $(\text{BrO}_3)^-$
- NaBrO_3 Bromato di sodio
- $\overset{4}{\text{H}} \overset{6}{\text{S}} \overset{-2}{\text{O}_3} \rightarrow (\text{HSO}_3)^-$ acido
- NaHSO_3 Idrogeno solfito di sodio
- NaHSO_4 Idrogeno solfato di sodio
- Na_2SO_4 Solfato di idrogeno
- Bromo molecolare

② $n_{\text{NaBrO}_3} = 2$

$$M_{\text{mNaBrO}_3} = 150.89 \text{ g/mol}$$

$$M_{\text{NaBrO}_3} = 75.45 \text{ g}$$

$$M_{\text{Br}_2} = 159.80 \text{ g/mol}$$

$$M_{\text{Br}_2} = 100 \text{ kg} = 1000 \text{ g}$$

$$\Rightarrow n_{\text{Br}_2} = 6.26 \text{ mol}$$

$$n_{\text{NaBrO}_3} = 2 n_{\text{Br}_2} = 12.52 \text{ mol}$$

$$n_{\text{NaHSO}_3} = 5 n_{\text{Br}_2} = 31.29 \text{ mol}$$

$$M_{\text{mNaHSO}_3} = 104.10 \text{ g/mol}$$

$$\Rightarrow M_{\text{NaBrO}_3} = 1889.11 \text{ g}$$

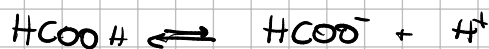
$$M_{\text{NaHSO}_3} = 3287.29 \text{ g}$$

③ $PV = nRT \Rightarrow P_{\text{Br}_2} = \frac{nRT}{V} = \frac{n_{\text{Br}_2} \cdot 0.0821 \cdot 273 + 56.85}{0.5} = 338 \text{ atm}$

es 3

$$4.82 \times 10^{-3} \text{ M di HCOOH}$$

$$K_a = 1.75 \times 10^{-4}$$



$$K_a = \frac{[\text{HCOO}^-][\text{H}^+]}{[\text{HCOOH}]}$$

$$= \frac{x^2}{4.82 \times 10^{-3} - x}$$

	$[\text{HCOOH}]$	$[\text{HCOO}^-]$	$[\text{H}^+]$
i	$\frac{4.82}{1.75 \times 10^{-4}}$	/	/
D	$-x$	x	x
e	$\frac{4.82}{1.75 \times 10^{-4}} - x$	x	x

$$\Rightarrow K_a(1-x) = x^2 \Rightarrow x^2 + K_a x - K_a M = 0$$

$$\Rightarrow x = 8.35 \times 10^{-4}$$

$$[\text{HCOO}^-] = [\text{H}^+] = 8.35 \times 10^{-4}$$

$$[\text{HCOOH}] = 3.98 \times 10^{-3}$$

$$\text{pH} = -\log 8.35 \times 10^{-4} = 3.08$$

es 4

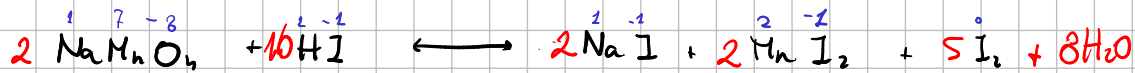
$$m = 5 \text{ g di Hg} \Rightarrow m_m = 200.6 \text{ g/mol}$$

$$n_{\text{Hg}} = \frac{m}{m_m} = 0.025 \text{ mol}$$

$$\Rightarrow N_{\text{atomi}} = N_A \cdot n =$$

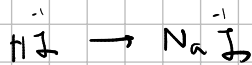
ESAME 1

es 1



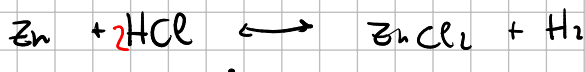
$$\Delta(\text{NaMnO}_4) = 7 \rightarrow 2 \text{ vs.}$$

$$\Delta(\text{I}) = -1 \rightarrow 0 \quad \uparrow + 2 \times 5 \rightarrow 10 \text{ perché c'è I}_2$$



Per manganese... in soluzione
Acido iodidrico
Ioduro di sodio
Ioduro di manganese (II)
Iodo molecolare.

es 2



Calcola V_{H_2} ottenuto sciogliendo 15.23 g Zn in 26.16 mL di HCl 5M

Quale reagente rimane?

$$n_{\text{Zn}} = 0.233 \text{ mol}$$

$$n_{\text{HCl}} = [\text{H}] \cdot V_{\text{HCl}} = 0.131 \text{ mol}$$

! Si dovrebbe avere $n_{\text{HCl}} = 2n_{\text{Zn}} = 0.466 \Rightarrow \text{HCl limitante}$

$$n_{\text{HCl}} = 0.466 - 0.131 = 0.335$$

$$n_{\text{H}_2} = \frac{1}{2} n_{\text{HCl}} = 0.0655 \text{ mol}$$

$$V = \frac{nRT}{P} = \frac{0.0655 \text{ mol} \cdot 0.08206 \cdot 66 + 273.15}{2.5 \text{ Atm}}$$

$$= 706 \text{ mL}$$

Il reag. limitante si consuma tutto

$$n_{Zn} = \frac{1}{2} n_{HCl} = 0.065 \text{ mol}$$

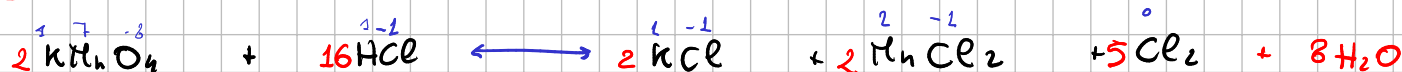
$$n_{Zn} = 0.233 \text{ mol}$$

$$\Rightarrow \Delta n_{Zn} = 0.1675$$

$$\Rightarrow Z_n \text{ rimasto} = 10.9 \text{ g}$$

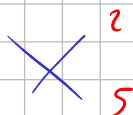
~~es 3~~

es 2



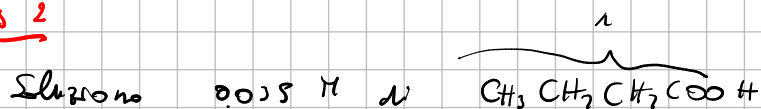
$$\Delta Mn : 7 \rightarrow 2 \downarrow 5$$

$$\Delta Cl : -1 \rightarrow 0 \uparrow 1 \cdot 2 = 2$$



Permanganato di potassio
Acido cloridrico
Cloruro di potassio
Cloruro di manganese II

es 2



$$K_a = 1.5 \times 10^{-5}$$

$$K_a = \frac{[H^+][A^-]}{[T_u H_o]}$$

$$K_a = \frac{x^2}{(0.035 - x)} \Rightarrow$$

$$x^2 + K_a x - K_a \cdot 0.035 = 0$$

$$x = \frac{-K_a + \sqrt{K_a^2 - 4 \cdot (-K_a) \cdot (-0.035)}}{2} \Rightarrow x = 7.17 \times 10^{-6} \text{ M}$$

$$[T_u H_o] = 0.0343 \text{ M}$$

$$pH = -\log(\quad) = 3.14$$

	$T_u H_o$	A	H^+
i	0.035	0	0
a	-x	x	x
e	0.035 - x	x	x

cs 3