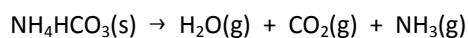
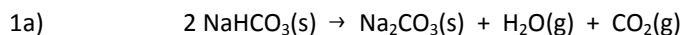


Forslag til FACITLISTE plakatopgaver 2010



1b)  $n(\text{NaHCO}_3) = 2 n(\text{Na}_2\text{CO}_3) = \frac{0,631\text{g}}{105,99\text{g/mol}} = 2 \cdot 5,95 \text{ mmol} \Rightarrow m(\text{NaHCO}_3) = 84,00 \cdot 11,907 = 1,000\text{g}$

$\Rightarrow m(\text{NH}_4\text{HCO}_3) = 1,500\text{g}$

2a)  $K_s = [\text{SO}_4^{2-}] \cdot [\text{H}_3\text{O}^+] / [\text{HSO}_4^{1-}] = (1+x) \cdot x / (x-1) = 0,0102 \Rightarrow x = 0,01. [\text{H}_3\text{O}^+] = 1,01 \text{ M} \Rightarrow \text{pH} = 1,0$

2b)  $K_s = [\text{SO}_4^{2-}] \cdot [\text{H}_3\text{O}^+] / [\text{HSO}_4^{1-}] = (0,01+x) \cdot x / (x-0,01) = 0,0102 \Rightarrow x = 0,0042. [\text{H}_3\text{O}^+] = 0,0142 \text{ M} \Rightarrow \text{pH} = 1,85$

2c) Der er følgende ligevægt:  $\text{NH}_4^+(\text{aq}) + \text{CN}^-(\text{aq}) \rightleftharpoons \text{NH}_3(\text{aq}) + \text{HCN}(\text{aq})$  med ligevægtskonstanten:

$[\text{NH}_3] \cdot [\text{HCN}] \cdot [\text{H}_3\text{O}^+] / ([\text{NH}_4^+] \cdot [\text{CN}^-] \cdot [\text{H}_3\text{O}^+]) = K_s(\text{NH}_4^+) / K_s(\text{HCN}) = 0,911 = x \cdot x / (0,1-x) \cdot (0,1-x) \Rightarrow$

$x / 0,1-x = 0,954$  og  $\text{pH} = \text{p}K_s + \log([\text{NH}_3] / [\text{NH}_4^+]) = \text{p}K_s + \log(x / 0,1-x) = 9,25 + \log(0,954) = 9,23$ . **SVÆR**

3a)  $n(\text{F}) = 42,81 \text{ g} / 19,00 \text{ g/mol} = 2,253 \text{ mol} \Rightarrow n(\text{X}) = 2,253 / 5; m(\text{X}) = 57,19 \text{ g} \Rightarrow M(\text{X}) = 126,9 \text{ g/mol}$

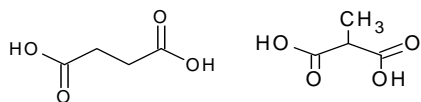
3b) Der går fem enkeltbindinger (mellem F og iod) og et lone pair ud fra iod. Opbygningen er derfor oktaedrisk.

4a)  $n(\text{C}) = 3,387 \text{ mol}, n(\text{H}) = 5,080 \text{ mol}$  og  $n(\text{O}) = 3,388 \text{ mol} \Rightarrow$  empirisk formel:  $\text{C}_2\text{H}_3\text{O}_2$

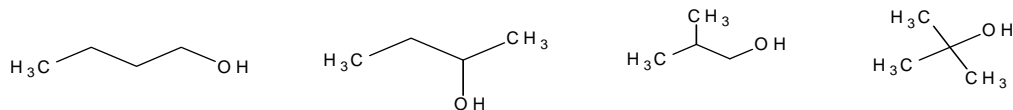
4b)  $n(\text{NaOH}) = 4,50 \text{ mmol}$  svarer til  $4,50 \text{ mmol}$   $-\text{COOH}$  grupper  $\Rightarrow M(\text{ per } -\text{COOH}) = 0,266 / 0,00450 =$

$59,1 \text{ g/mol}$ . Da  $\text{C}_2\text{H}_3\text{O}_2$  netop har den molare masse  $59,1 \text{ g/mol}$ , må molekylet være  $\text{C}_4\text{H}_6\text{O}_4$ .

4c)



5a+b)



5c+d)

