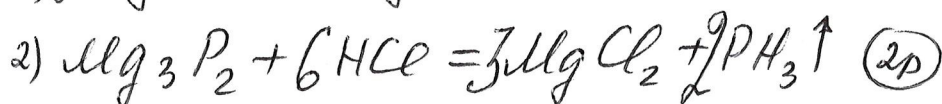
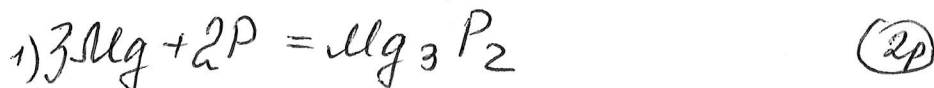


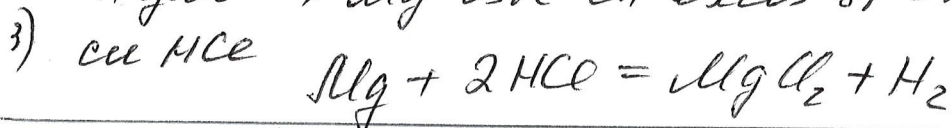
# Clasa X Test

① $\begin{array}{c} \square \\   \\ \text{H}-\text{B}-\text{H} \\   \\ \text{H} \end{array}$ este acceptor, pt. că are un orbital liber	(c)
② $238 \xrightarrow{42,349\%} M_r = 562$ $18n = 562 - 238 = 324$ $M_r - 100\%$ } $n = 18$ $\Rightarrow \text{Cr}(\text{NO}_3)_3 \cdot 18\text{H}_2\text{O}$ $w\%(\text{O}) = \frac{27 \cdot 16}{562} = \frac{432}{562} = 76,868\%$	(a)
③ $5\overset{0}{\text{C}}\text{H}_2\text{O} + 4\text{K}\overset{+7}{\text{Mn}}\overset{-2}{\text{O}}_4 + 12\text{HNO}_3 \Rightarrow 5\overset{+4}{\text{C}}\text{O}_2 + 4\overset{+2}{\text{Mn}}(\text{NO}_3)_2 + 4\text{KNO}_3 + 11\text{H}_2\text{O}$ $\begin{array}{ccc} -4e^- & +5e^- & \\ \text{red.-2} & \text{ox.-1} & \end{array}$ $4+5=9 \Rightarrow$	(c)
④ $\text{H}-\overset{\sigma}{\text{C}} \equiv \overset{\sigma}{\text{N}}$ $\Rightarrow 2\sigma + 2\pi \Rightarrow$	(d)
⑤ a) $\overset{+6}{\text{Cr}}\text{O}_3$ doar ox-t    b) $\text{H}_2\overset{-1}{\text{O}}_2$ si ox-t, si red-2 $\begin{array}{ccc} & \swarrow & \searrow \\ & \text{O}_2^0 & \text{O}^{-2} \end{array}$ c) $\overset{-3}{\text{P}}\text{H}_3$ doar red-2    d)	(b)
⑥ $\rho = \frac{M}{V_m} \Rightarrow M = 1,964 \cdot 22,4 = 44 \rightarrow$ a) $\text{C}_3\text{H}_8 \Rightarrow \text{H}_3\text{C}-\text{CH}_2-\text{CH}_3$ $\rightarrow$ c) $\text{CO}_2 \Rightarrow$ are doar leg. polare	(a)
⑦ $V_{\text{sol}} = 1\text{L} \Rightarrow n_{\text{KOH}} = 0,8\text{mol}$ ( $0,8 \cdot 56 = 44,8\text{g}$ ) $m_{\text{sol}} = 1150\text{g} \Rightarrow w\% = \frac{44,8 \cdot 100}{1150} = 3,89\% \Rightarrow$	(b)
⑧ $\frac{\text{H}_2\text{S}}{34} + \frac{\text{Cl}_2}{71} + \frac{\text{CO}}{28} \Rightarrow M = \frac{34+71+28}{3\text{mol}} = \frac{133}{3} = 44,33\text{ g/mol}$ $\frac{22,4\text{e}}{22,4\text{e}} \quad \frac{22,4\text{e}}{22,4\text{e}} \quad \frac{22,4\text{e}}{22,4\text{e}}$ $D(\text{form}) = \frac{44,33}{29} = 1,529 \Rightarrow$	(c)
⑨ $\overset{+2}{\text{Sr}}_3\overset{-3}{\text{P}}_2 \Rightarrow$ fosfură de stronțiu	(c)
⑩ a) $\overset{+1}{\text{N}}\overset{+1}{\text{H}}\overset{-1}{\text{P}}\overset{-2}{\text{r}_2}$ b) $\overset{-2}{\text{N}}_2\overset{+1}{\text{H}}_4$ c) $\overset{+1}{\text{H}}_3\overset{-3}{\text{C}}-\overset{-1}{\text{N}}-\overset{-3}{\text{C}}\overset{+1}{\text{H}}_3$ d) $\overset{+3}{\text{N}}\overset{-2}{\text{O}}\overset{-1}{\text{C}}$	(c)
(1c) (2a) (3c) (4d) (5b) (6a) (7b) (8c) (9c) (10c)	

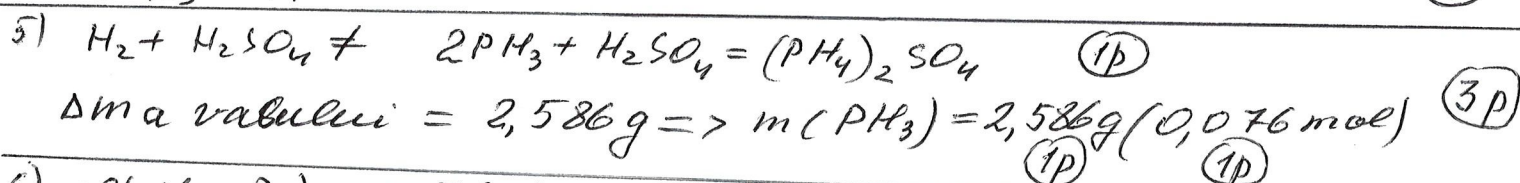
Clasa 10 Problema 1



Dacă se degajă amestec gazos A  $\Rightarrow$  deci mai este un gaz  $\Rightarrow$  Mg este în exces și excesul a inter. (2p)



4)  $v(A) = \frac{6,585}{22,4} = 0,294 \text{ mol}$  (1p)



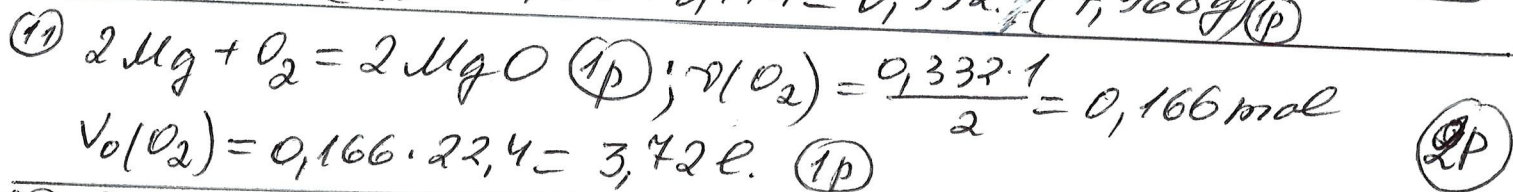
6)  $v(Mg_3P_2) = \frac{0,076 \cdot 1}{2} = 0,038$  (1p)  $v(Mg) = 0,038 \cdot 3 = 0,114 \text{ mol}$  (2p)

7)  $v(H_2) = 0,294 - 0,076 = 0,218 \text{ mol} (0,436 \text{ g})$  (1p)

8)  $m(A) = \frac{0,436 \text{ g}}{m(H_2)} + \frac{2,586 \text{ g}}{m(PH_3)} = 3,022 \text{ g}$  (1p)

9)  $\rho(A) = \frac{m}{V} = \frac{3,022 \text{ g}}{6,585 \text{ l}} = 0,459 \text{ g/L}$  (1p)

10) Dacă  $v(H_2) = 0,218 \text{ mol} \Rightarrow v(Mg) = v(H_2) = 0,218 \text{ mol}$  (1p)  
 $v_{\text{total}}(Mg) = 0,218 + 0,114 = 0,332 \text{ mol} (7,968 \text{ g})$  (2p)



12)  $\frac{P_0 V_0}{T_0} = \frac{P_1 V_1}{T_1} \Rightarrow V_1 = \frac{101,325 \cdot 3,72 \cdot 300}{273 \cdot 98} = 4,225 \text{ l}$  (1p)

13)  $v_1(HCl) = 0,038 \cdot 6 = 0,228 \text{ mol}$  (1p);  $v_2(HCl) = 0,218 \cdot 2 = 0,436$  (1p)  
 $v_{\text{total}}(HCl) = 0,228 + 0,436 = 0,664 \text{ mol}$  (1p) (3p)

14)  $m(HCl) = 0,664 \cdot 36,5 = 24,24 \text{ g}$ ;  $m_{\text{sol}} = \frac{24,24 \cdot 100}{21,9} = 110,67 \text{ g}$  (2p)  
 $V_{\text{sol}} = \frac{110,67}{1,1} = 100,6 \text{ ml}$  (1p)

total: 25p



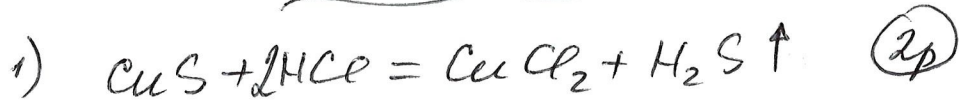
Clasa 10. Problema 2

- ① gazele (C):  $\rho = \frac{M}{V_m} \Rightarrow M = 1,4286 \cdot 22,4 = 32 \Rightarrow O_2$  (1p) (1p)
- ② gazele (G) - gaz colorat, pt. gaze de lupbăi  $\Rightarrow Cl_2$  (1p) (1p)
- ③ Dacă  $Cl_2$  se uzează pt. obț. lui (E)  $\Rightarrow$  care nu colorează sol. de f/fbalein  $\Rightarrow$  (E) este HCl gaz bine solubil (1p) (1p)
- ④ Metal de tip S, colorarea flacăra violet  $\Rightarrow K$  (1p) (1p)
- ⑤ Deci (A) și (D) conțin K și O, dacă E (HCl) se obține din (B) iar (B) din (A)  $\Rightarrow$  (A) și (D) conțin și Cl. Concluzie sărurile pot fi:  $KClO$ ,  $KClO_2$ ,  $KClO_3$ ,  $KClO_4$ . (1p) (2p)
- (A)  $KClO_3$   $M_r = 122,5$  (D)  $KClO_4$   $M_r = 138,5 \Rightarrow \frac{138,5}{122,5} = 1,13$  (1p)

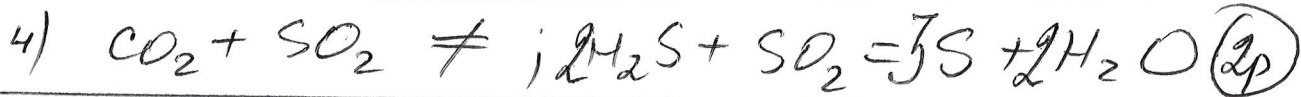
- ⑥ ①  $2KClO_3 \Rightarrow 2KCl + 3O_2$  (2p) (A) (B) (C) (2p)
- ②  $4KClO_3 \Rightarrow KCl + 3KClO_4$  (2p) (A) (B) (2p)
- ③  $KCl + H_2SO_4(l) = HCl + KHSO_4$  (2p) (B) (E) (F) (2p)
- ④  $KClO_3 + 6HCl = 3Cl_2 + KCl + 3H_2O$  (2p) (A) (E) (G) (B) (2p)
- ⑤  $KCl + AgNO_3 = AgCl \downarrow + KNO_3$  (1p) (B) (H) (M) (1p)
- ⑥  $HCl + AgNO_3 = AgCl \downarrow + HNO_3$  (1p) (E) (H) (N) (1p)
- ⑦  $AgCl \downarrow + 2NH_4OH = [Ag(NH_3)_2]Cl + 2H_2O$  (3p) (H) (L) (3p)
- ⑧  $5Cl_2 + Br_2 + 12KOH = 10KCl + 2KBrO_3 + 6H_2O$  (3p) (G) (B) (3p)
- ⑨  $2HCl + Fe = FeCl_2 + H_2 \uparrow$  (2p) (E) (R) (W) (2p) { ⑩  $3Cl_2 + 2Fe = 2FeCl_3$  (2p) (G) (Q) (4p)
- ⑪  $Cl_2 + H_2 = 2HCl$  (1p) (G) (W) (E) (1p) { ⑫  $2FeCl_2 + Cl_2 = 2FeCl_3$  (3p) (2p) (R) (G) (Q) (3p)

Total: 29p

# Clasa 10 Problema 3



3)  $\nu(\text{H}_2\text{S}) + \nu(\text{CO}_2) = \frac{17,024}{22,4} = 0,76 \text{ mol}$  (1p)



5) sub. solidă  $\Rightarrow \underline{\text{S}} \Rightarrow \nu(\text{S}) = \frac{21,12}{32} = 0,66$  (1p)

6)  $\nu(\text{H}_2\text{S}) = \frac{0,66 \cdot 2}{3} = 0,44 \text{ mol}$  (1p)

7)  $\nu(\text{CO}_2) = 0,76 - 0,44 = 0,32 \text{ mol}$  (1p)

8)  $\nu(\text{CuS}) = \nu(\text{H}_2\text{S}) = 0,44 \text{ mol}$  } (1p)

$m(\text{CuS}) = 0,44 \cdot 96 = 42,24 \text{ g}$

$m(\text{Me}_2(\text{CO}_3)_n) = 89,6 - 42,24 = 47,36 \text{ g}$  (1p)

9)  $\nu(\text{Me}_2(\text{CO}_3)_n) = \frac{0,32 \cdot 1}{n} \text{ (mol)}$  (1p)

$M(\text{Me}_2(\text{CO}_3)_n) = \frac{m}{\nu} = \frac{47,36}{0,32} \cdot n = 148n$  (1p)

10) a) Fie  $n=1$ ;  $\Rightarrow M(\text{Me}_2\text{CO}_3) = 148$

$M(\text{Me}) = \frac{148 - 60}{2} = 44 \text{ g}$

b) Fie  $n=2$   $\Rightarrow M(\text{Me}_2(\text{CO}_3)_2) = 148 \cdot 2 = 296$

$M(\text{Me}) = \frac{296 - 60 \cdot 2}{2} = 88 \Rightarrow \underline{\text{Sr}}$

Me  $\Rightarrow$  Sr (3p)

Total: 17p