

ПИСЬМЕННАЯ РАБОТА

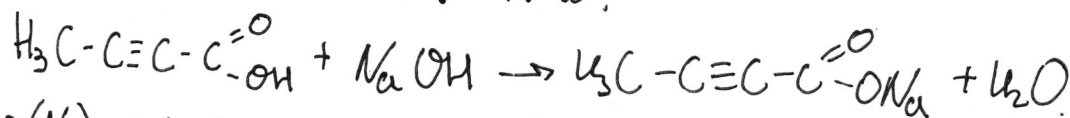
ШИФР

(заполняется секретарём)

№6.

Дано:
 $\omega(C) = 57,14\%$
 $\omega(O) = 38,10\%$
 $\omega(H) = 4,76\%$
 $C(NaOH) = 1 \text{ моль}$
 $V = 10 \text{ мл} = 0,01 \text{ л}$

Пусть $m_{\text{в-ва}} = 100 \text{ г}$, тогда
 $m(C) = 57,14 \text{ г}$ $\nu(C) = 57,14 : 12 = 4,76 \text{ моль}$
 $m(O) = 38,10 \text{ г}$ $\nu(O) = 38,10 : 16 = 2,38 \text{ моль}$
 $m(H) = 4,76 \text{ г}$ $\nu(H) = 4,76 : 1 = 4,76 \text{ моль}$
 $C : H : O$
 $4,76 : 4,76 : 2,38$
 $2 : 2 : 1$
 $4 : 4 : 2$

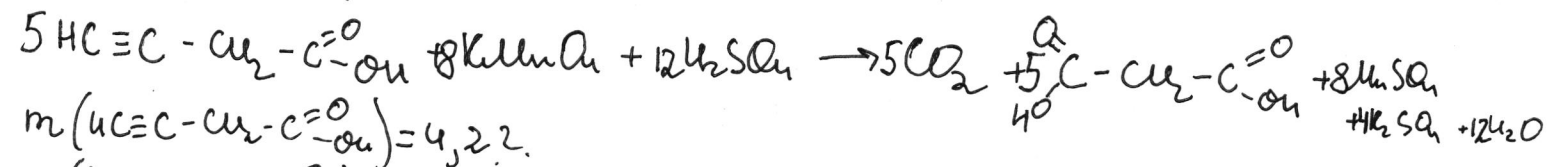


$\nu(Na) = V_p(Na) = 0,01 \text{ моль}$. По стехиометрическим коэффициентам $\nu_{K-TO} = 0,01 \text{ моль}$.
 Т.к. из условия задачи $m(H_3C-C \equiv C-C(=O)OH) = 0,84 \text{ г}$, найдем M для к-то.
 $M = 0,84 : 0,01 = 84 \text{ г/моль}$

Она совпадает с M найденного в-ва.

$H_3C-C \equiv C-C(=O)OH$ 2-бутиновая кислота.

$HC \equiv C-CH_2-C(=O)OH$ 3-бутиновая кислота



$m(HC \equiv C-CH_2-C(=O)OH) = 4,22 \text{ г}$

$\nu(HC \equiv C-CH_2-C(=O)OH) = 0,05 \text{ моль}$ по стехиометрич. кэф. $\nu(CO_2) = 0,05 \text{ моль}$

$V(CO_2) = 0,05 \cdot 22,4 = 1,12 \text{ л}$

$M(HO-C(=O)-CH_2-C(=O)OH) = 104 \text{ г/моль}$

$\nu(HO-C(=O)-CH_2-C(=O)OH) = 0,05 \text{ моль}$

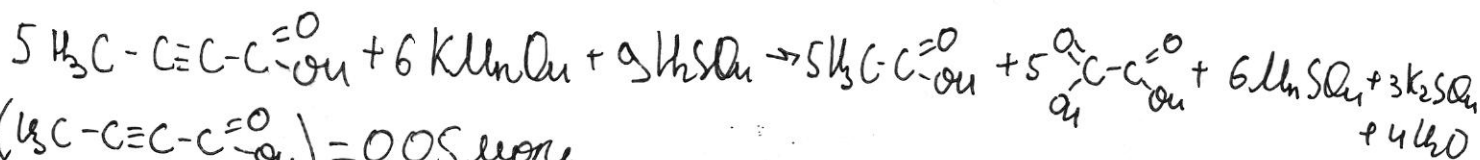
$m(HO-C(=O)-CH_2-C(=O)OH) = 5,22 \text{ г}$

☐ черновик ☒ чистовик

(Поставьте галочку в нужном поле)

Страница № 1

(Нумеровать только чистовики)



$$\nu(\text{H}_3\text{C}-\text{C}\equiv\text{C}-\text{C}\equiv\text{O}) = 0,05 \text{ моль}$$

$$\nu(\begin{smallmatrix} \text{O} \\ \diagup \text{C} \diagdown \\ \text{O} \end{smallmatrix}) = 0,05 \text{ моль}$$

$$m(\begin{smallmatrix} \text{O} \\ \diagup \text{C} \diagdown \\ \text{O} \end{smallmatrix}) = 0,05 \cdot 90 = 4,5 \text{ г}$$

✓ 2.

Дано:

$$m(\text{Fe}_3\text{O}_4) = 23,14 \text{ г}$$

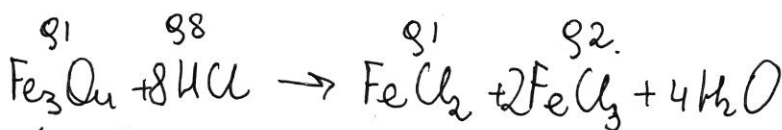
$$\rho(\text{HCl}) = 1,04 \text{ г/мл}$$

$$\rho(\text{HCl}) = 1,04 \text{ г/мл}$$

$$C(\text{HCl}) = 1 \text{ моль/л}$$

$$m(\text{Fe}) = 15 \text{ г}$$

$$m(\text{Fe})_{\text{ост}} = ?$$

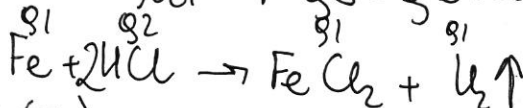


$$\nu(\text{HCl}) = 1 \text{ моль}$$

$$\nu(\text{Fe}_3\text{O}_4) = 23,14 : 232 = 0,0997 \approx 0,1 \text{ моль}$$

HCl - избыток

$$\nu(\text{HCl})_{\text{ост}} = 1 - 0,8 = 0,2 \text{ моль}$$



$$\nu(\text{Fe}) = 15 : 56 = 0,27 \text{ моль}$$

$$\nu_{\text{н}}(\text{Fe}) = 0,1 \text{ моль}$$

$$\nu_{\text{ост}}(\text{Fe}) = 0,27 - 0,1 = 0,17 \text{ моль}$$

$$m(\text{H}_2) = 0,1 \cdot 2 = 0,2 \text{ г}$$

$$m(\text{Fe}) = 0,17 \cdot 56 = 9,52 \text{ г}$$

$$m_{\text{кр}} = 1000 \cdot 1,04 + 23,14 + 15 - 9,52 - 0,2 = 1068,42 \text{ г}$$

$$\nu(\text{FeCl}_2) = 0,2 \text{ моль} \quad m(\text{FeCl}_2) = 25,4 \text{ г} \quad \omega(\text{FeCl}_2) = 2,38\%$$

$$\nu(\text{FeCl}_3) = 0,2 \text{ моль} \quad m(\text{FeCl}_3) = 32,5 \text{ г} \quad \omega(\text{FeCl}_3) = 3,04\%$$

Ответ: $m_{\text{серьезы}} = 9,52 \text{ г}$; $\omega(\text{FeCl}_2) = 2,38\%$; $\omega(\text{FeCl}_3) = 3,04\%$

11. Дано:

$$\rho_{\text{H}_2} = 14$$

$$\rho_{\text{H}_2} = 7$$

$$m(\text{H}_2\text{O}) = 16 \text{ г}$$

$$\rho_2 = 1,25 \text{ г/л}$$

$$m(\text{ABC}) = 168 \text{ г}$$

Решение:

$$M(\text{ABC}) = 14 \cdot 2 = 28 \text{ г/моль}$$

$$\nu(\text{ABC}) = 168 : 28 = 6 \text{ моль}$$

Если 50% 1-й газа погасилось $\Rightarrow \omega(\text{A}) = 50\%$

$$M(\text{BC}) = 7 \cdot 4 = 28 \text{ г/моль}$$

$$\nu(\text{A}) = 3 \text{ моль}$$

$$\nu(\text{BC}) = 3 \text{ моль}$$

$$m(\text{BC}) = 28 \cdot 3 = 84 \text{ г}$$

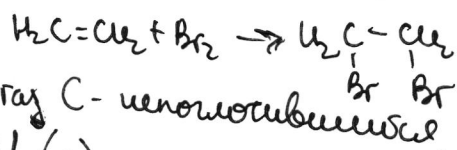
ПИСЬМЕННАЯ РАБОТА

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(заполняется секретарём)

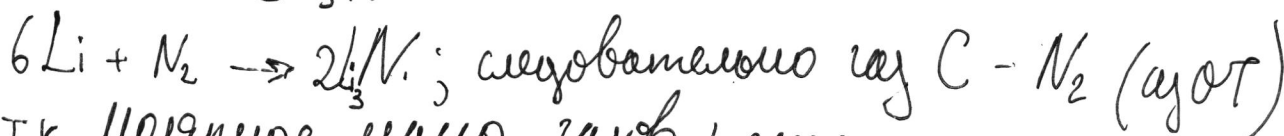
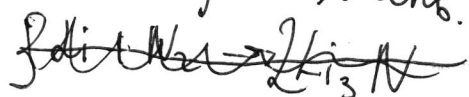
$$m(A) = 168 - 84 = 84 \text{ г}$$

$$M(A) = 84 : 3 = 28 \text{ г/моль} \Rightarrow \text{HC} = \text{C}_2\text{H}_2 \text{ (этин)}$$

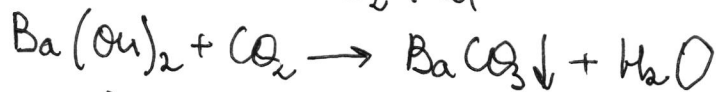
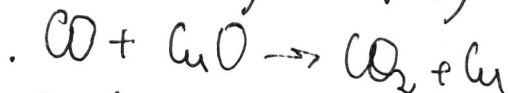


$$M(\text{C}) = 1,25 \cdot 22,4 = 28 \text{ г/моль}$$

$$M(\text{N}_2) = 28 \text{ г/моль}$$



т.к. молярные массы газов 1 смеси и 2-ой равны, значит
и $M(\text{C}_2\text{H}_4) = M(\text{N}_2) \Rightarrow$ молярная масса газа В = 28 г/моль.



$$M(\text{CO}) = 28 \text{ г/моль}$$

$$\nu(\text{CuO}) = 16 : 80 = 0,2 \text{ моль}$$

$$\nu(\text{CO}) = 0,2 \text{ моль}$$

$$m(\text{CO}) = 0,2 \cdot 28 = 5,6 \text{ г}$$

$$\omega(\text{CO}) = \frac{5,6}{168} = 3,3\%$$

~~$$\omega(\text{CO})$$~~
$$\nu(\text{N}_2) = \frac{84 - 5,6}{28} = 2,8 \text{ моль}$$

$$m(\text{N}_2) = 78,4 \text{ г}$$

$$\omega(\text{N}_2) = \frac{78,4}{168} = 46,7\% = 46,7\%$$

$$\omega(\text{C}_2\text{H}_4) = \frac{84}{168} = 50\%$$

~~$$M = \nu(\text{CO}) \cdot M(\text{CO}) + \nu(\text{N}_2) \cdot M(\text{N}_2)$$~~

~~$$28 = x \cdot 28 + (1-x) \cdot 28$$~~

Ответ: $\omega(\text{C}_2\text{H}_4) = 50\%$

$$\omega(\text{N}_2) = 46,7\%$$

$$\omega(\text{CO}) = 3,3\%$$

☐ черновик

☒ чистовик

(Поставьте галочку в нужном поле)

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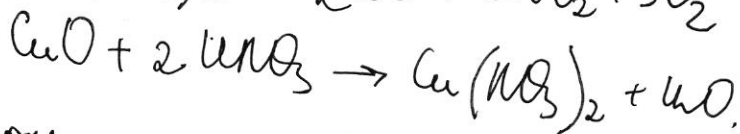
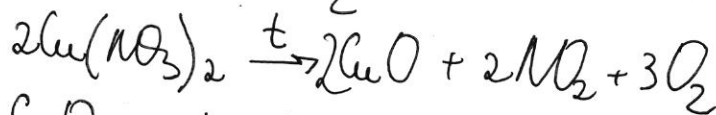
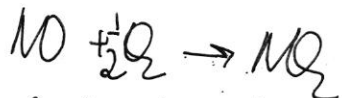
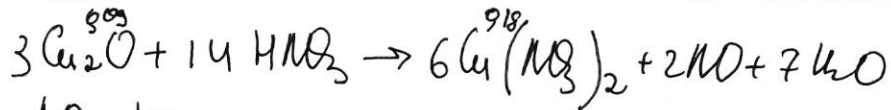
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(Нумеровать только чистовики)

$$M_4 \quad m(A) = 12,72.$$

$$D_{H_2} = 15.$$

$$m(H) = 15,9.$$



$$\nu(Cu_2O) = 12,7 : 144 \approx 0,09 \text{ моль.}$$

$$M_{раза} = 30\% \text{ моль} = M(NO)$$

$$\nu(CuO) = 15,9 : 80 \approx 0,2 \text{ моль.}$$

По стехиометрическим коэффициентам $\nu(Cu(NO_3)_2) = 0,18 \text{ моль} \Rightarrow$
 $\Rightarrow \nu(CuO) = 0,18 \approx 0,2 \text{ моль.}$

$$A - Cu_2O$$

$$B - HNO_3$$

$$C - Cu(NO_3)_2$$

$$D - NO$$

$$E - NO_2$$

$$G - O_2$$

$$H - CuO$$

№3 Дано.

$$m(X) = 29,12.$$

$$V(HCl) = 100 \text{ мл.}$$

$$m_p = 119,92.$$

$$pH = 1$$

$$m(AgCl) = 0,1432.$$

$$\Delta m = 52,8$$

$$V_2 = 224 \text{ л}$$

$$\rho = 1,25 \text{ г/л.}$$

$$m \text{ в-ва раствор. в } H_2O = 119,9 - 100 = 19,92.$$

$$pH = -\lg[H^+]$$

$$-1 = \lg[H^+]$$

$$[H^+] = 0,1 \text{ моль/л.}$$

$$\nu(H^+) = 2 \cdot 0,1 = 0,2 \text{ моль.}$$



$$\nu(AgCl) = 0,143 : 143,5 = 0,001 \text{ моль.}$$

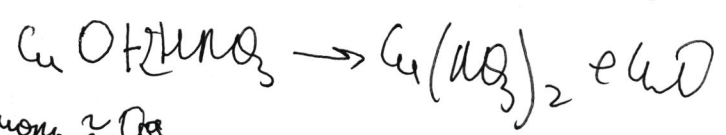
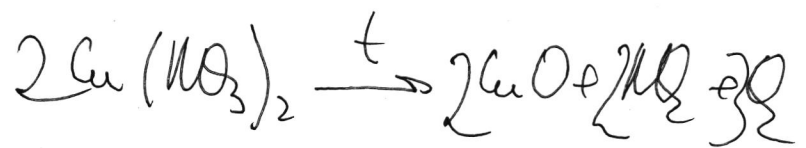
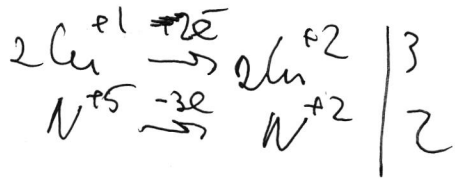
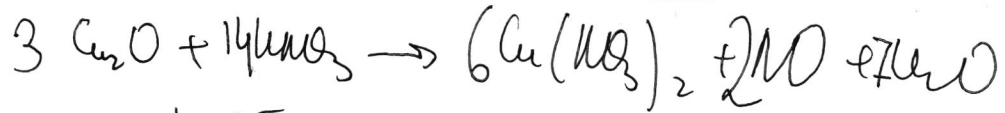
$$m(NaOH) = 962.$$

$M_{раза} = 1,25 \cdot 224 = 28 \text{ г/моль.}$ предполагаем $N_2 \Rightarrow$
 катион этого соли M_{H^+}

$\text{HCl} +$
 $\text{pH} = -\lg[\text{H}^+]$
 $-1 = \lg x$
 $[\text{H}^+] = 0.1$

N_2 CO $\nu(\text{CO})=1$ SO_2 CO_2 H_2S
 Mn

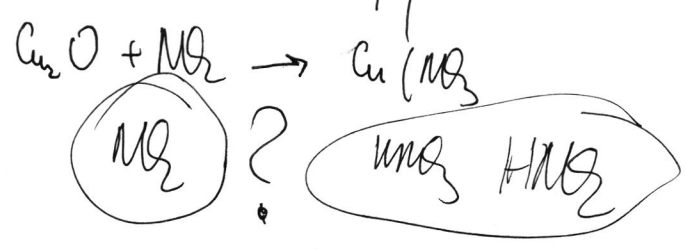
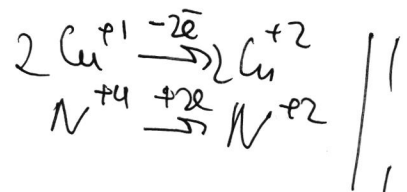
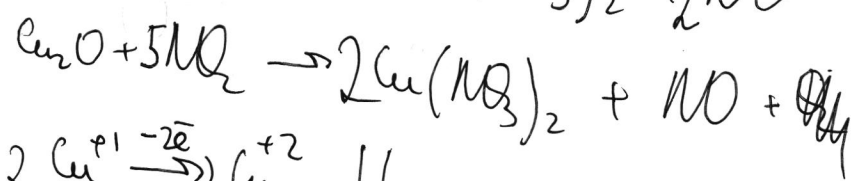
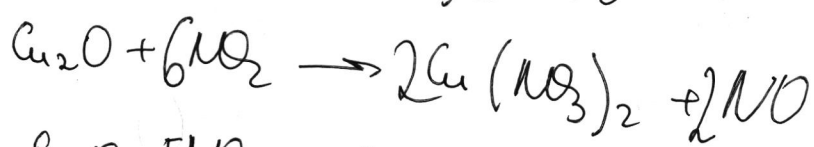
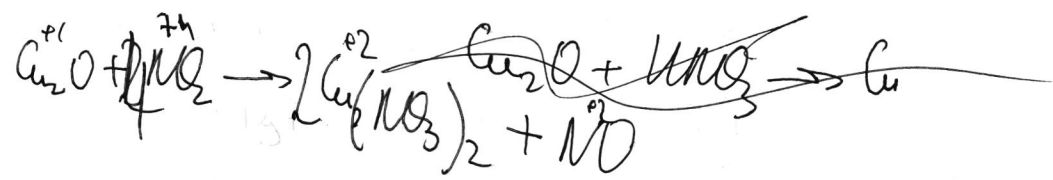
45 C 45



$\nu(\text{Cu}_2\text{O}) = 12,7 : 144 = 0,0881 \text{ моль } \approx 0,09$

$M(\text{NO}) = 30 \text{ г/моль}$

$\nu(\text{CuO}) = 15,9 : 80 = 0,19875 \approx 0,2$



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$$\mu(\text{PCl}_3) = 137,5 \text{ г/моль}$$

мг

$$\mu(\text{MnO}_2) = 28 + 32 + 4$$

$$m(\text{AgCl}) = 0,1432$$



CO

$$M = \varphi_1 \cdot M_1 + \varphi_2 \cdot M_2$$

кальций

$$\text{pH} = -\lg[\text{H}^+]$$

$$-1 = \lg x$$

$$* x = \frac{1}{10} = 0,1$$

$$\frac{x}{2} = 0,2$$

$$\varphi(\text{HCl}) = 0,4$$

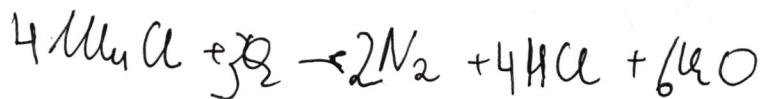
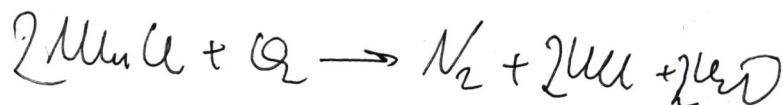
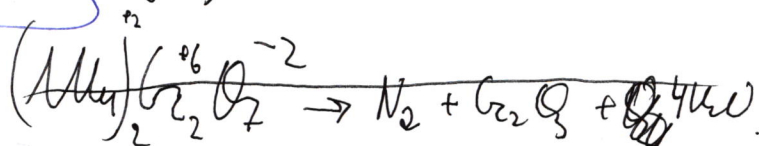
$$m(\text{AgCl}) = 0,1432$$

$$m_{\text{H}_2} = 9,22 \cdot 10^{-2}$$

г/моль

$$m(\text{NaOH}) = 962$$

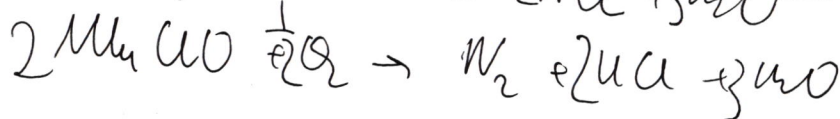
$$m(\text{O}_2) = m_{\text{O}_2} = 52,82$$



$$\varphi(\text{MnO}_2) = 29,1; 53,5 = 9543925,3$$



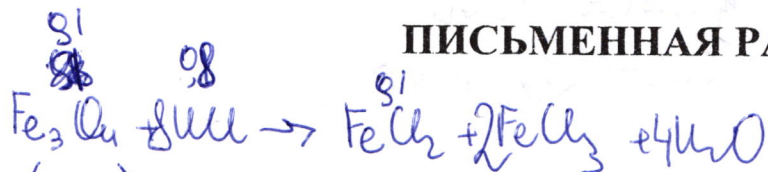
$$\varphi(\text{AgCl}) = 9143; 143,5 = 0,000997$$



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$$\nu(\text{H}_2) = 1 \text{ моль} - \text{исходик}$$

$$m_p(\text{H}_2) = 1,04 \cdot 1000 = 1040 \text{ г}$$

$$M(\text{Fe}_3\text{O}_4) = 231,4 : 232 = 0,9987 \approx 0,999$$



$$\nu(\text{Fe}) = 0,27 \text{ моль}$$

$$\nu(\text{Fe})_{\text{ок}} = 0,27 - 0,1 = 0,17 \text{ моль}$$

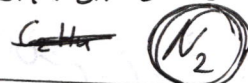
$$m(\text{Fe})_{\text{ок}} = 0,52 \text{ г}$$

$$m_p = 1040 + 23,14 + 15 - 0,52 - 0,2 = 1068,42 \text{ г}$$

$$m(\text{FeCl}_2) = 0,2 \cdot 127 = 25,4$$

$$m(\text{FeCl}_3) = 0,2 \cdot 162,5 = 32,5$$

$$12n + 2n - 2 = 28$$



$$1) M = 28$$

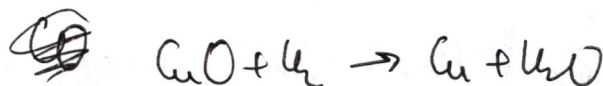
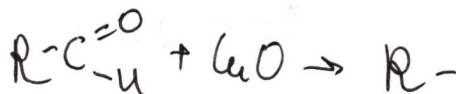
$$\omega(A) = 50\% - \text{не по массе Br}_2$$

$$\nu = 6 \text{ моль}$$

$$\nu(A) = 3 \text{ моль}$$

$$2) M = 28 \text{ г/моль}$$

$$\nu(\text{CuO}) = 0,2 \text{ моль}$$



$$28 =$$



$$28 \cdot 3 = 84$$

$$\nu(\text{C}=\text{C}) = 3$$

$$m(\text{C}=\text{C}) = 3 \cdot 28 = 84$$

☒ черновик

☐ чистовик

Страница №

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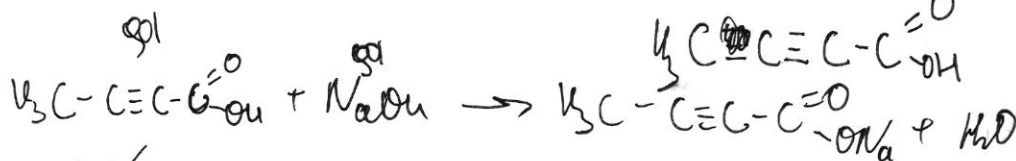
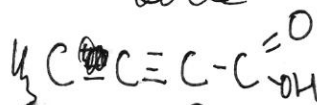
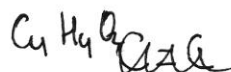
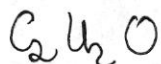
$\text{Пусть } m_{C-H} = 100\%$
 $m(C) = 57,14\%$ $\nu(C) = 4,76$
 $m(O) = 38,10\%$ $\nu(O) = 2,38$
 $m(H) = 4,76\%$ $\nu(H) = 4,76$

$4,76 : 4,76 : 2,38$

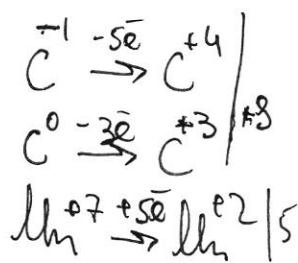
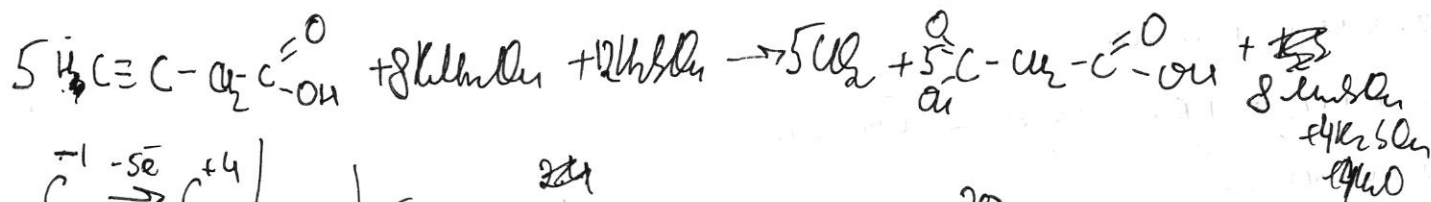
$C = \frac{\nu}{V} =$

$2 : 2 : 1$

$1 = 1$

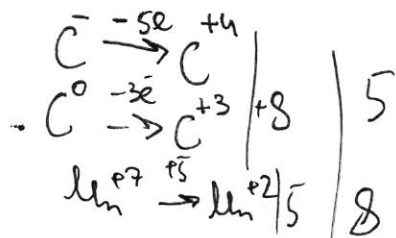


$M = 84 \text{ г/моль}$



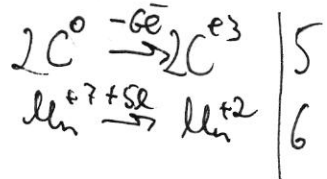
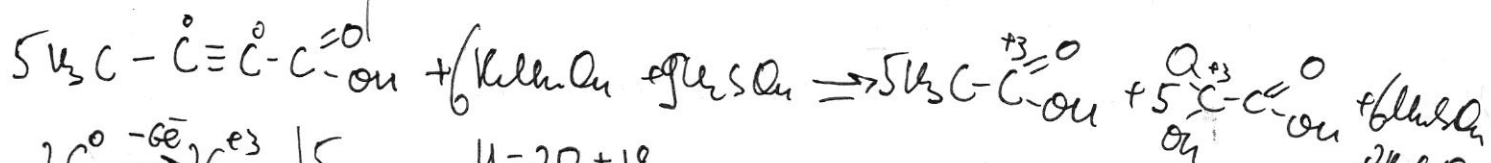
$\begin{array}{l} 28 \\ 10 + 32 + 48 \end{array}$

$\begin{array}{l} 20 \\ 10 + 4 + 20 \\ 32 \quad 16 \end{array}$



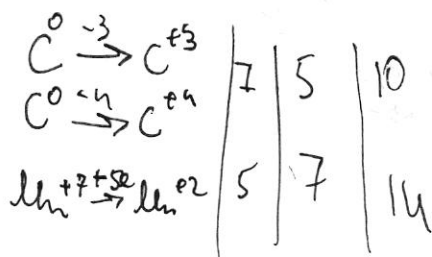
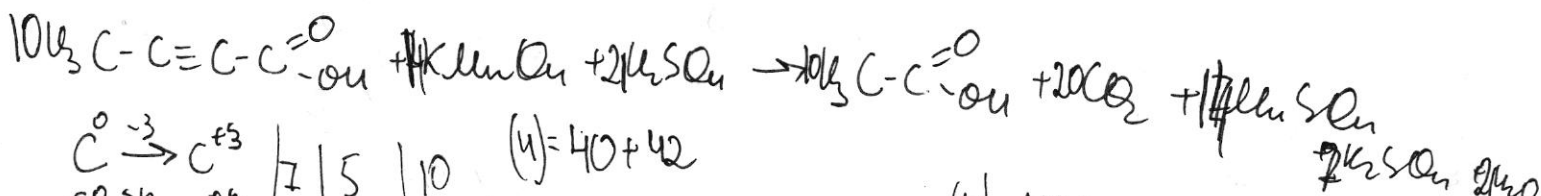
$H = 20 + 24 = 44$
 $O = 10 + 32 + 48$

$H = 20$
 $O = 10 + 20 + 12 + 32 + 16$



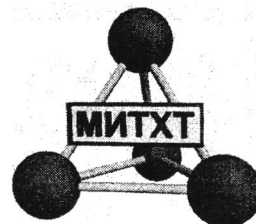
$H = 20 + 18$
 $O = 10 + 24$

$H = 20 + 10$
 $O = 10 + 20 + 4$



$(H) = 40 + 42$
 $O = 20 + 56$

$(H) = 40 +$
 $O = 20 + 40 + 21$



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ШИФР

(заполняется секретарём)

