ЧИСТОВИК
Лист № 1

825 дней

ВСОШ Химия

1	2	3	4	5	6	7	8	9	10
6		8	4	6	10	12	12	4	20

7.1

$4Fe(NO_3)_2 \xrightarrow{t} 2Fe_2O_3 + 8NO_2 + O_2$ +

$Fe_2O_3 + 6HBr \rightarrow 2FeBr_3 + 3H_2O$ +

$FeBr_3 + Na_2SO_3 + H_2O \rightarrow Fe(OH)_3 + NaBr$ +89 +

$Fe(OH)_3 + 3NaOH_{(к)} \rightarrow Na_3[Fe(OH)_6]$ +

$Na_3[Fe(OH)_6] + 3CO_2 \rightarrow 3Na_2CO_3 + 2Fe(OH)_3 + 3H_2O$ +

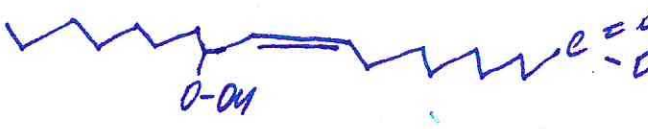
$2Fe(OH)_3 + 3Cl_2 + 10KOH \rightarrow 2K_2FeO_4 + 6KCl + 8H_2O$ + 12,5

10.1

$CH_2-O-C(=O)-(CH_2)_7-CH=CH-(CH_2)_5-CH_3$

$CH-O-C(=O)-(CH_2)_7-HC=CH-(CH_2)_5-CH_3$

$CH_2-O-C(=O)-(CH_2)_7-CH=CH-CH_2-C\equiv C-(CH_2)_5-CH_3$ +



$+2KI + 2CH_3-C(=O)-OH \rightarrow$

$+ I_2 + CH_3-C(=O)-OK$

$2Na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

~~KI + ICl~~

$KI + ICl \rightarrow I_2 + KCl$

$$C\left(\tfrac{1}{2}O\right) = \frac{(V_к - V_0)\cdot C \cdot 1}{m}$$

$$C\left(\tfrac{1}{2}O\right) = \frac{(0{,}0025 - 0{,}0001)\cdot 0{,}01 \cdot 1}{0{,}005} = 0{,}0048 \text{ моль}$$

$$\nu(O) = \frac{0{,}0048}{2} = 0{,}0024 \text{ моль} = 2{,}4 \text{ ммоль} \Rightarrow 2{,}4 \leq 2{,}5 \text{ ммоль}$$

$\Rightarrow$ доброкачественное

$V_к - V_0 = 0{,}0025 - 0{,}0001 = 0{,}0024$

$\nu(I_2) = \frac{1}{2}\nu(Na_2S_2O_3)$

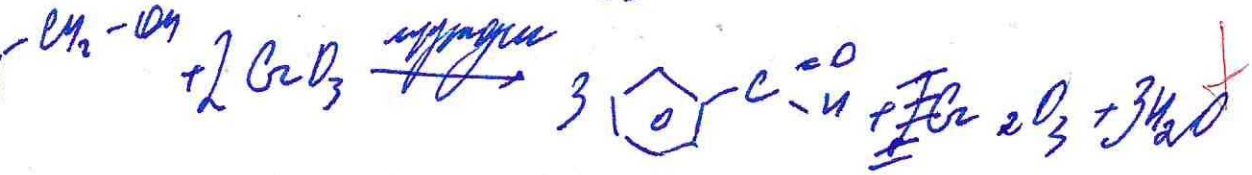
$\nu(Na_2S_2O_3) = 0{,}0024 \cdot C(Na_2S_2O_3) = 0{,}0024 \cdot 0{,}01 = 0{,}000024$ моль

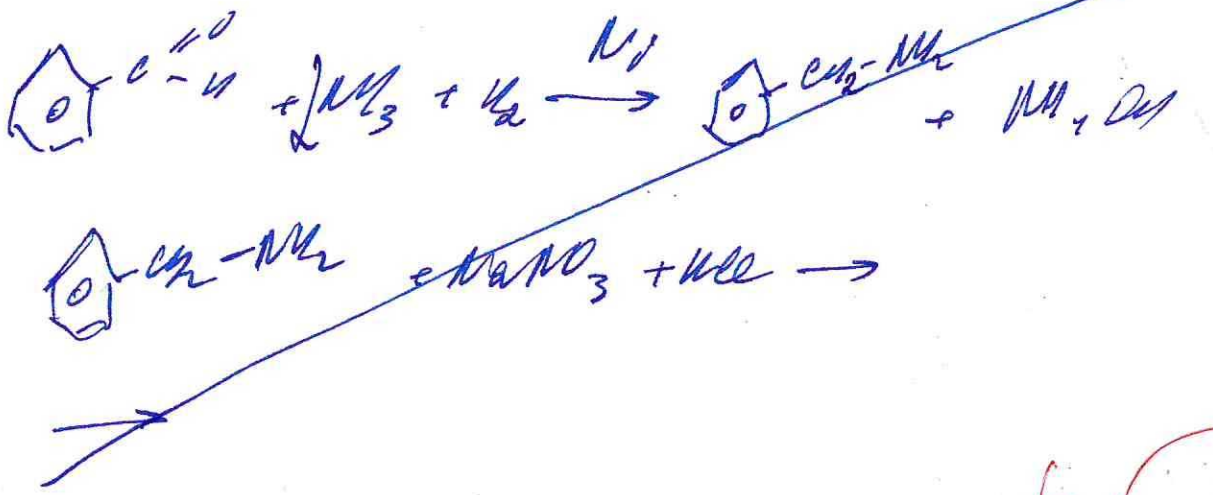
$\nu(I_2) = \frac{0{,}000024}{2} = 0{,}000012$ моль

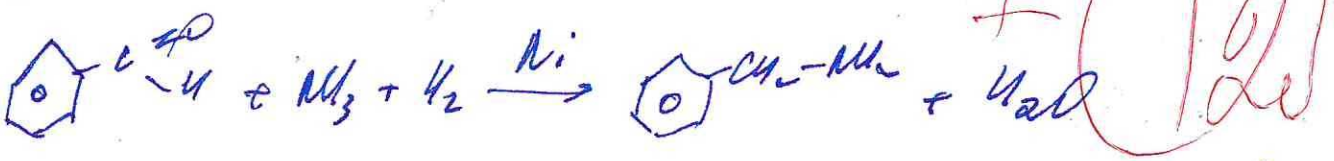
$\nu(I_2) = \nu(O_2)$

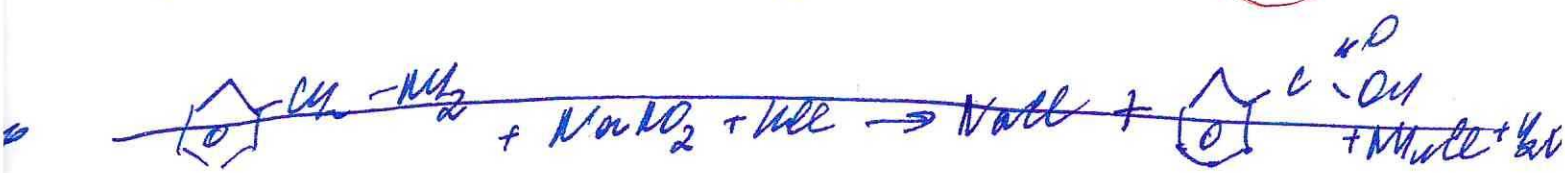
$\omega(O_2) = \frac{0{,}000012 \cdot 16}{0{,}005} = 0{,}0384 \approx 3{,}84\%$

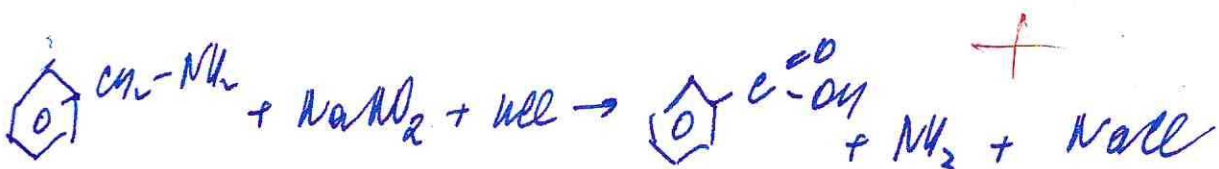
8.1



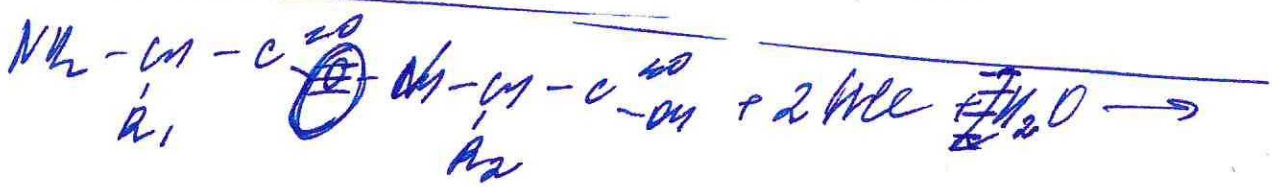


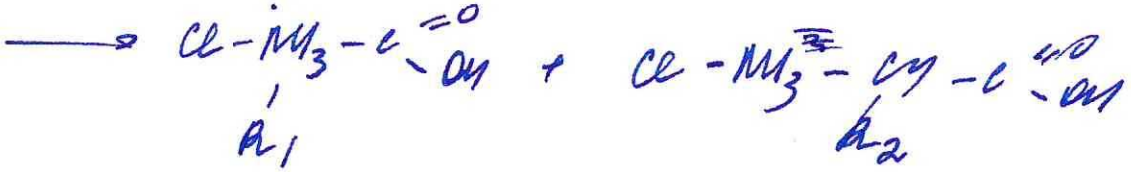


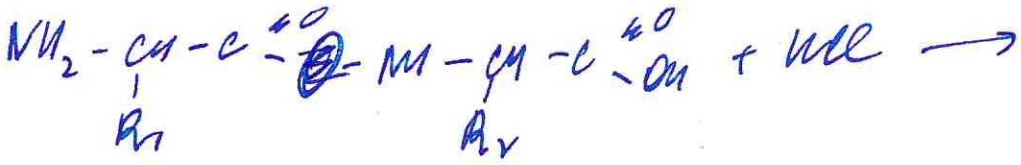


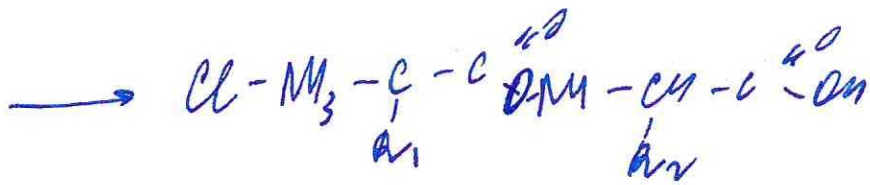


6.1

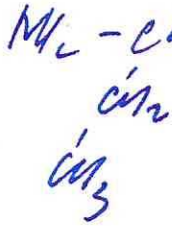








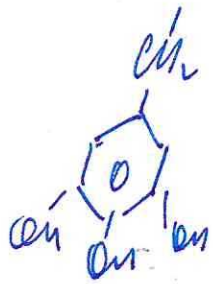
$M_2(\text{I}) = \frac{35,5}{0,225\text{ч}} = 139,8\ \text{г/моль}$ $M_2(\text{NH}_2\text{-CH-C(=O)-OH}) = 89\ \text{г/моль}$

$R_1 = 139 - 74 - 36,5 = 29\ \text{г/моль} \Rightarrow$ 

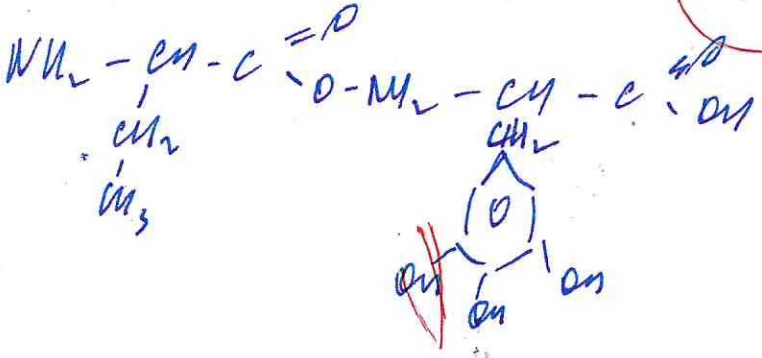
$M_2(\text{NH}_2\text{-CH-C(=O)-OH}) = 29 + 74 = 103\ \text{г/моль}$

$M_2(\text{III р.}) = \frac{35,5}{0,1055} = 336,5\ \text{г/моль}$

$M(R_2) = 336,5 - 103\ \text{г/моль} - 36,5 + 18 = 139\ \text{г/моль}$



10 б

Ответ: 

3.1 $V_ц = \pi R^2 h$ $D = 10,0\,см - (0,1\,см) \cdot 2 = 9,8\,см$

$R = \frac{1}{2} D$ $R = \frac{9,8}{2} = 4,9\,см$

$V_ц = 3,14 \cdot 4,9^2 \cdot 20 = 1507,8\,см^3$

$V(H_2O) = 1507,8 \cdot 0,6 = 904,8\,см^3 = 0,9048\,л$

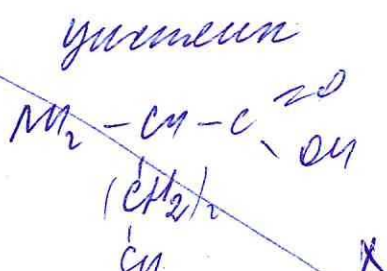
$V(NH_3) = 904,8 \cdot 15,5 = 14,024$ ~~моль~~ л

NH_3 $\frac{14,024}{22,4} = 625,8\,см^3 = 0,625\,л$ 8

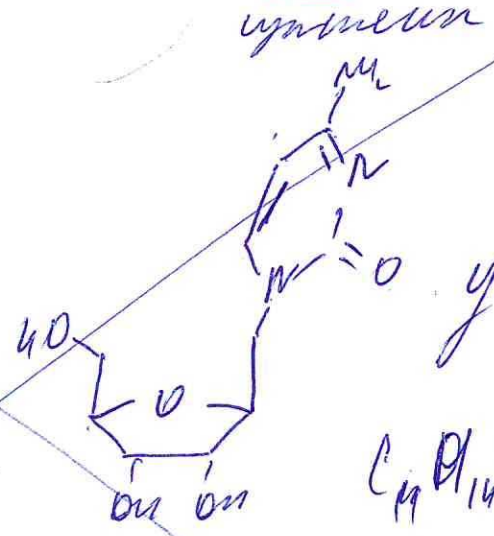
$NH_3 = \frac{0,62508}{0,9048} = 0,6906$

$pH = 14 - 0,5(4,26 - \lg 0,69) = 11,5$

9.1



$C_4H_9NO_2S$



$C_{11}H_{14}O_5N_3$

$5C_4H_9NO_2S + 19O_2 \rightarrow 8CO_2 + 5NO_2 + 5SO_2 + 9H_2O$

$CuH_9NO_2S - 2\bar{e} \rightarrow 4C^{+4} + 9H^+ + N^0 + 2O^{-2} + S^{+4}$

У $C_6H_{12}O$

$CuH_9NO_2S -$

$CuH_9NO_2S - 24\bar{e} \rightarrow 4C^{+4} + 9H^+ + N^0 + 2O^{-2} + S^{+4}$

ЧИСТОВИК
Лист № 6

ВСОШ Химия

9.1

$D(NO_2) = D(NO_2)_2$

$x = 3y$

угл. $CaCO_3 + SO_2 \rightarrow CaSO_3 + H_2O$ $m(CaCO_3) = 100$ г

$CaCO_3 + NO_2 \rightarrow CaNO_3 + H_2O$ $m(CaNO_3) = 120$ г

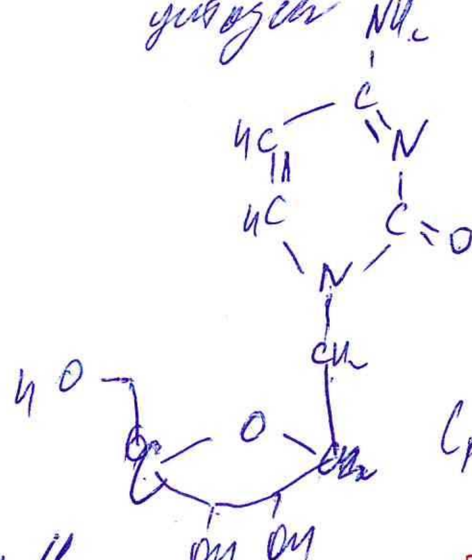
утилизи $CaCO_3 + NO_2 \rightarrow CaNO_3 + H_2O$

в 2,5 раза больше

$NH_2-CH(CH_2-SH)-C(=O)OH$ угл

$C_3H_7O_2NS$

утилизи



$C_{11}H_{12}O_4N_3$

$4C_3H_7NO_2S + ?O_2 \rightarrow 12CO_2 + 4NO_2 + H_2O + SO_2$

$4C_{11}H_{22}O_4N_3 + O_2 \rightarrow SO$

$CaCO_3 + SO_2 \rightarrow CaSO_3 + H_2O$

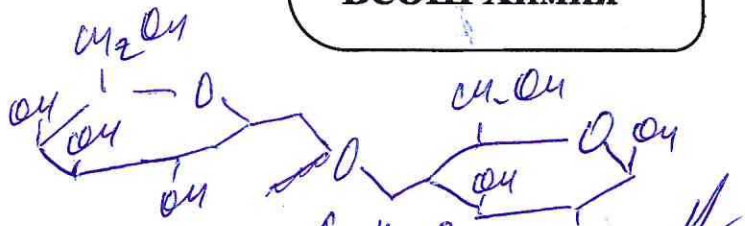
$CaCO_3 + NO_2 \rightarrow CaNO_3 + H_2O$

$CaCO_3 + NO_2 \rightarrow CaNO_3 + H_2O$

ЧИСТОВИК
Лист № 7

ВСОШ Химия

Ч.1



$C_6H_{12}O_6$ $\quad C_{12}H_{22}O_{11}$

$C_6H_{12}O_6 + [Ag(NH_3)_2]OH \rightarrow C_6H_{15}O_7 + 2Ag + 2NH_3 + H_2O$

$C_{12}H_{22}O_{11} + [Ag(NH_3)_2]OH \rightarrow C_{12}H_{25}O_{12} + 2Ag + 2NH_3 + H_2O$

$2Ag + 6HNO_3 \rightarrow 2Ag(NO_3)_2 + NO_2 + 2H_2O$

$\nu(HNO_3) = \frac{75{,}6 \cdot 0{,}85}{14+1+16\cdot 3} = \frac{56{,}7}{63} = 0{,}9$ моль $\Rightarrow \nu(NO_2) = \frac{1}{6}\nu(HNO_3) = 0{,}15$ моль

$5C_6H_{12}O_6 + 24KMnO_4 + 36H_2SO_4 \rightarrow 30CO_2 + 12K_2SO_4 + 24MnSO_4 + 66H_2O$

$C_6H_{12}O_6 \xrightarrow{-24e} 6C^{+4} + 12O^{-2} + 6O^{+4}$ | 5

$Mn^{+7} + 5e \rightarrow Mn^{+2}$ | 24

$5C_{12}H_{22}O_{11} + 48KMnO_4 + 72H_2SO_4 \rightarrow 60CO_2 + 24K_2SO_4 + 48MnSO_4 + 127H_2O$

$C_{12}H_{22}O_{11} - 48e \rightarrow 12C^{+4} + 22H^+ + 11O^{-2}$ | 5

$Mn^{+7} + 5e \rightarrow Mn^{+2}$ | 48

$T = 273 + 25 = 298$

$\nu(CO_2) \frac{pV}{RT} = \frac{29{,}42 \cdot 101}{8{,}31 \cdot 298} = \frac{2917{,}42}{2476} = 1{,}2$

$\begin{cases} x + y = 0{,}15 \\ 6x + 12y = 1{,}2 \end{cases}$

$x = 0{,}15 - y$

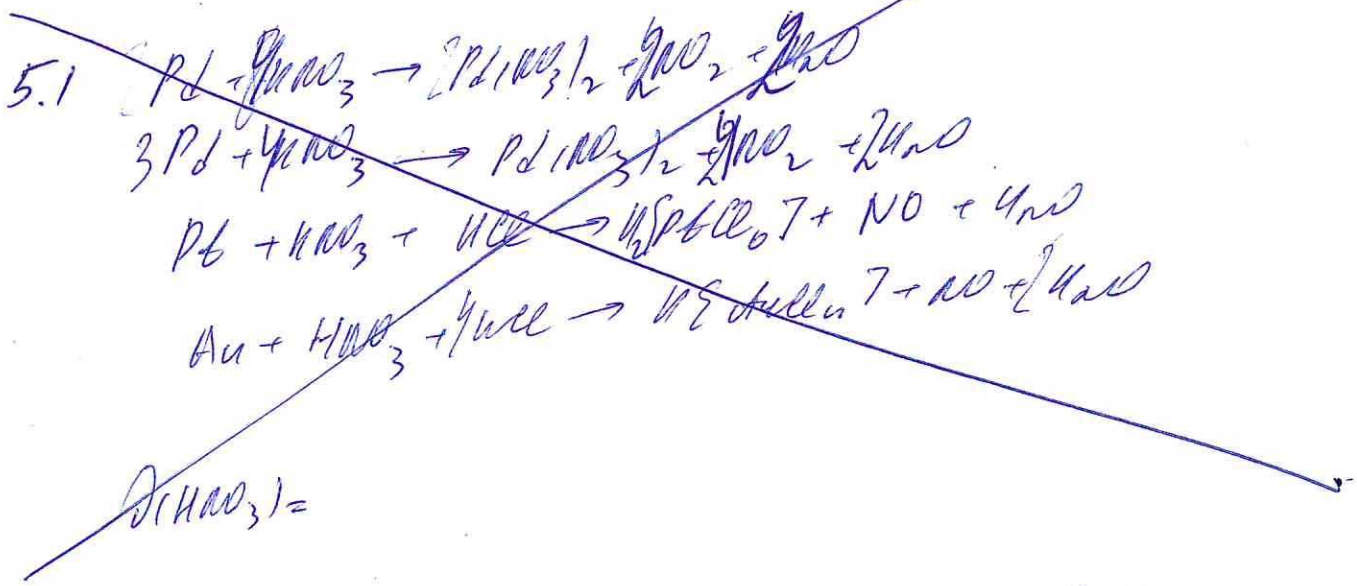
$6(0{,}15 - y) + 12y = 1{,}2$

$0{,}9 + 6y = 1{,}2$

$\begin{cases} y = 0{,}05 \\ x = 0{,}1 \end{cases}$

$m(\text{смеси}) = 0{,}05 \cdot 342 + 0{,}1 \cdot 180 = 17{,}1 + 18 = 35{,}1$ г $\quad m(\text{р-р}) = 35{,}1 \cdot 0{,}75 = 26{,}3$ г

5.1



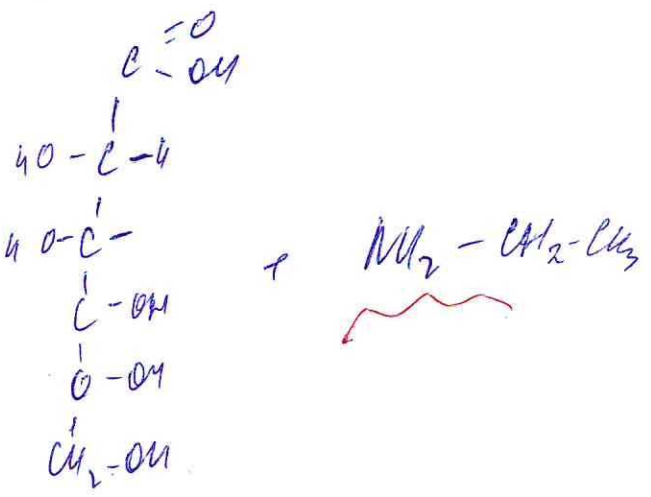
$Pb + HNO_3 \rightarrow Pb(NO_3)_2 + NO_2 + H_2O$

$3Pb + 4HNO_3 \rightarrow Pb(NO_3)_2 + 2NO + 2H_2O$

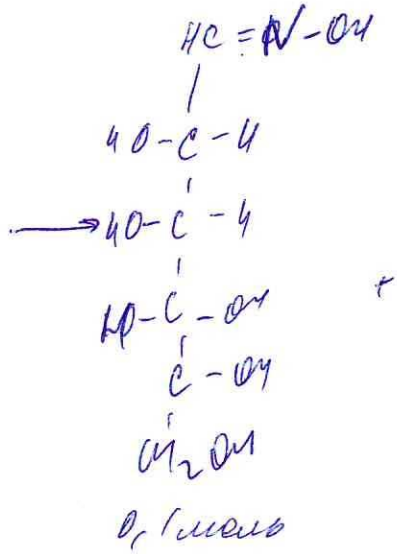
$Pb + HNO_3 + HCl \rightarrow H_2PbCl_6 + NO + H_2O$

$Au + HNO_3 + HCl \rightarrow HAuCl_4 + NO + 2H_2O$

$\vartheta(HNO_3) =$



0,1 моль



0,1 моль

48

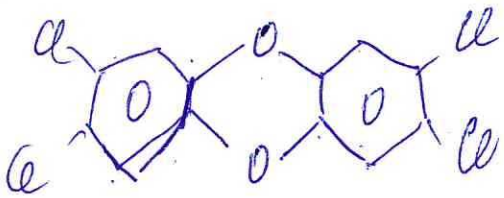
$\vartheta(C_6H_{12}O_6) = \vartheta(C_6H_{13}O_5N)$

$m(C_6H_{13}O_5N) = 0,1 \cdot 179 = 17,9$

$m(\text{выход } 75\%) = 17,9 \cdot 0,75 = 12,75$ г.

Ответ: 26,3 г смесь углеводов,
12,26 г.

1.1



C_6H_4 +

$C_{12}H_4O_2Cl_4$

x 322 г/моль

195,15 г/моль

y 219,5

$\omega_1 \quad 1 = \frac{322x}{322x + 195{,}15y}$

$\frac{12x + 6y}{4x + 3y} = 2{,}7273$

$2{,}73(4x + 3y) = 12x + 6y$

$10{,}92x + 8{,}19y = 12x + 6y$

$2{,}1y = 1{,}1x$

$x = 2y$

+ .68

$\nu_2(C_{12}H_4Cl_4O_2) = 322$

$\omega_1(C_{12}H_4Cl_4O_2) = \frac{322 \cdot 2y}{322 \cdot 2y + 219{,}5y} = \frac{644}{863{,}5} = 0{,}75 \approx 75\%$

+

$\Rightarrow \omega_1(C_6H_3Cl_3O\text{Na}) = 0{,}25 \approx 25\%$

Ответ: 25 %

5.1 $Pd + HNO_3 \rightarrow Pd(NO_3)_2 + NO_2 + H_2O$

$3Pd + 8HNO_3 + 6HCl \rightarrow 3H_2[PdCl_6] + 8NO + 4H_2O$

$Au + HNO_3 + 4HCl \rightarrow H[AuCl_4] + NO + 2H_2O$

$V_к = \frac{1}{3}\pi R^2 h$ 1,2 - ?

$V_к = \frac{1}{3} \cdot 3{,}14 \cdot 1{,}2^2 \cdot 3 = 4{,}47\ см^3$

$\frac{\nu(NO_2)}{\nu(HNO_3)} = 8{,}34$

$m = \frac{4{,}47 \cdot 12{,}800}{100} = 57{,}9$

$N_2^{+4} + KMnO_4 + H_2SO_4 \rightarrow N_2 + K_2SO_4 + MnSO_4 + H_2O$

N^{-}

$\nu(N_2) = \frac{25{,}6}{32} = 0{,}8$ моль $\quad \nu(x+y+z) = 0{,}1$

$$\begin{cases} 106x + 195y + 197z = 57{,}9 \\ 8{,}34(1{,}33y + z) = 0{,}8 \\ x = 0{,}4 \end{cases}$$

$1{,}33y + z = 0{,}09$

$z = 0{,}09 - 1{,}33y$

$106 \cdot 0{,}4 + 195y + 197(0{,}09 - 1{,}33y) = 57{,}9$

42,2 + 195y + 17,73 - 2,65y = 57,9

-33,43 = 10y

z = 0,029

1,33y + 0,029 = 0,09

y = 0,05

x = 0,4

6 г

m(Pd) = 0,4 · 106 = 42,2 г

m(Pt) = 0,029 · 195 = 5,65 г

m(Au) = 0,05 · 197 = 9,85 г

ω(Pd) = 42,2 / 57,9 ≈ 73%. +

ω(Pt) = 5,65 / 57,9 = 0,09 ≈ 10%. +

ω(Au) = 9,85 / 57,9 = 0,17 ≈ 17%. +