

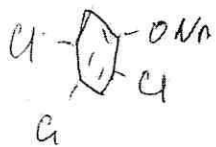
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ЧИСТОВИК
Лист № 31

ВСОШ ХИМИЯ

~~2 = 45~~

Задача 1.1



$$\frac{M(Cl)}{M(Cl)} = \frac{2,7273}{1} = \frac{M_A \cdot \nu(Cl)}{M_A \cdot \nu(Cl)}$$

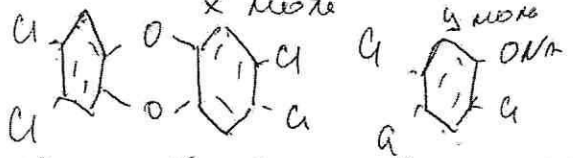
$$\nu(Cl) = 2,7273 \nu(Cl) \checkmark$$

2,4,5-трихлорореклет
натрия

Масса $\nu(16.6a)$ и $\nu(2b.6a) = 1$ моль
все смесь = 1 моль

$$3 + y = 2,7273 \cdot \nu(Cl)$$

2,3,7,8 - тетра хлорид бензо-пара-диоксида \Rightarrow 4 моль (Cl)



$$x + y = 1 \text{ моль}$$

$$\sum 12x + 6y = 2,7273 \cdot (4x + 3y)$$

$$12x + 6y = 10,9092x + 8,1819y$$

$$1,0908x = 1,36365y$$

$$x = 1 - y$$

$$1,0908(1 - y) = 1,36365y$$

$$1,0908 - 1,0908y = 1,36365y$$

$$1,0908 = 2,45445y$$

$$y = 0,44$$

6 моль $(C_{12}H_4O_2Cl_4)$ - 4 атома хлора

6 x моль $(C_{12}H_4O_2Cl_4)$ - 4x атомов хлора

6 моль $(C_{12}H_4O_2Cl_4)$ - 12 атомов (C)

6 x моль $(C_{12}H_4O_2Cl_4)$ - 12x атомов (C)

6 моль $(C_6H_2ONaCl_3)$ - 3 атома хлора

6 y моль $(C_6H_2ONaCl_3)$ - 3y атома хлора

6 моль $(C_6H_2ONaCl_3)$ - 6 атомов (C)

6 y моль $(C_6H_2ONaCl_3)$ - 6y атомов (C)

$$m(C_{12}H_4O_2Cl_4) = \nu \cdot M = 0,6667 \cdot 322 \text{ г/моль} = 214,6774 \text{ г}$$

$$m(C_6H_2ONaCl_3) = \nu \cdot M = 0,3333 \cdot 219,5 \text{ г/моль} = 73,16 \text{ г}$$

$$m(\text{смеси}) = 214,6774 + 73,16 = 287,8374 \text{ г}$$

$$\omega(C_{12}H_4O_2Cl_4) = \frac{m(C_{12}H_4O_2Cl_4)}{m(\text{смеси})} = \frac{214,6774 \text{ г}}{287,8374 \text{ г}} \cdot 100\% = 74,6\%$$

$$\omega(C_6H_2ONaCl_3) = \frac{m(C_6H_2ONaCl_3)}{m(\text{смеси})} = \frac{73,16 \text{ г}}{287,8374 \text{ г}} \cdot 100\% = 25,4\%$$

$$1,0908x = 2,1819y$$

$$x = 1 - y$$

$$1,0908(1 - y) = 2,1819y$$

$$1,0908 - 1,0908y = 2,1819y$$

$$1,0908 = 3,2727y$$

$$y = 0,3333$$

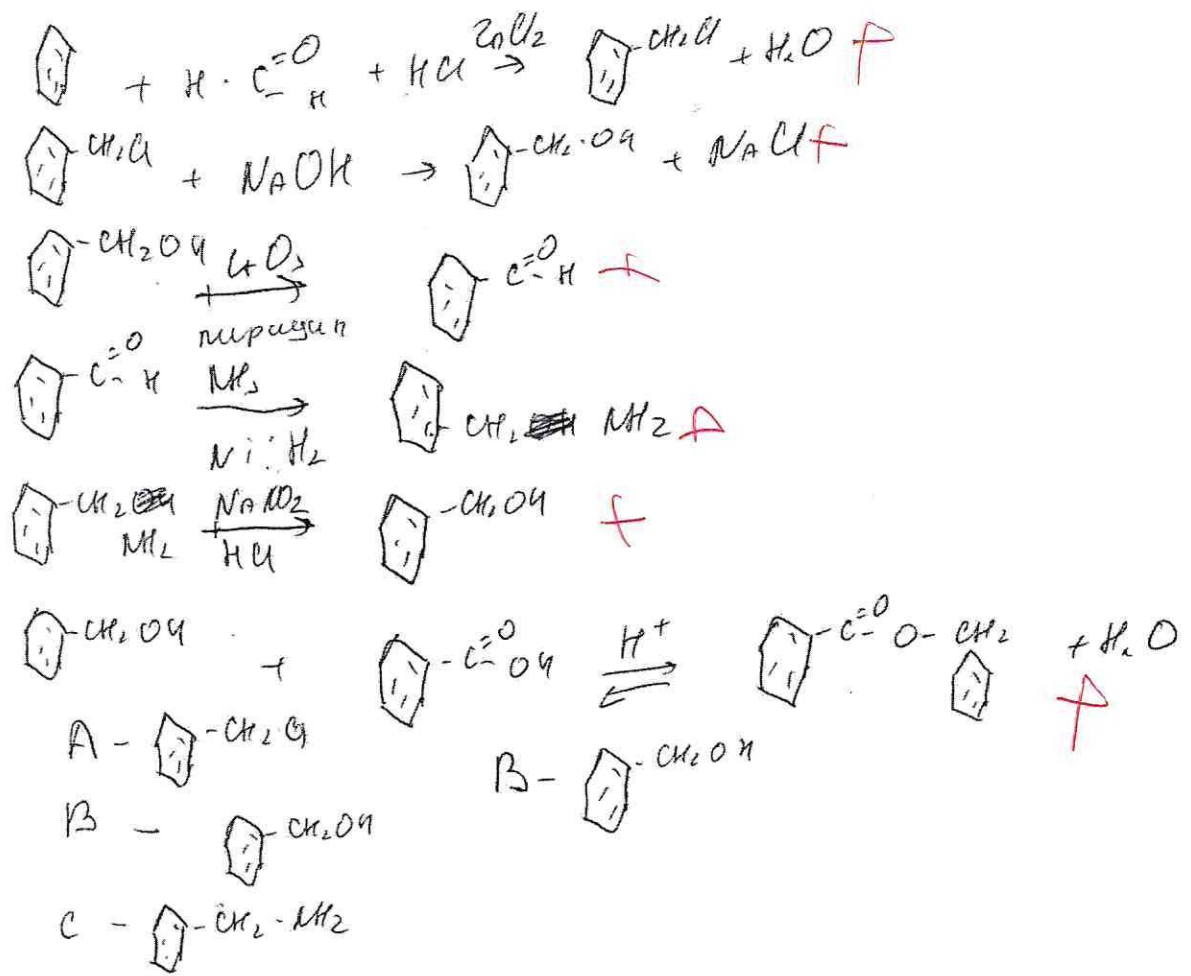
$$x = 0,6667$$



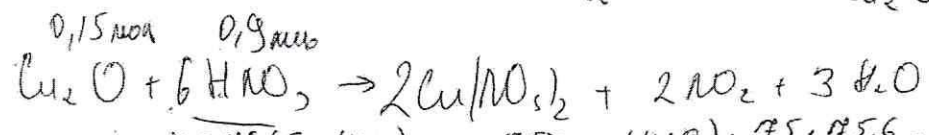
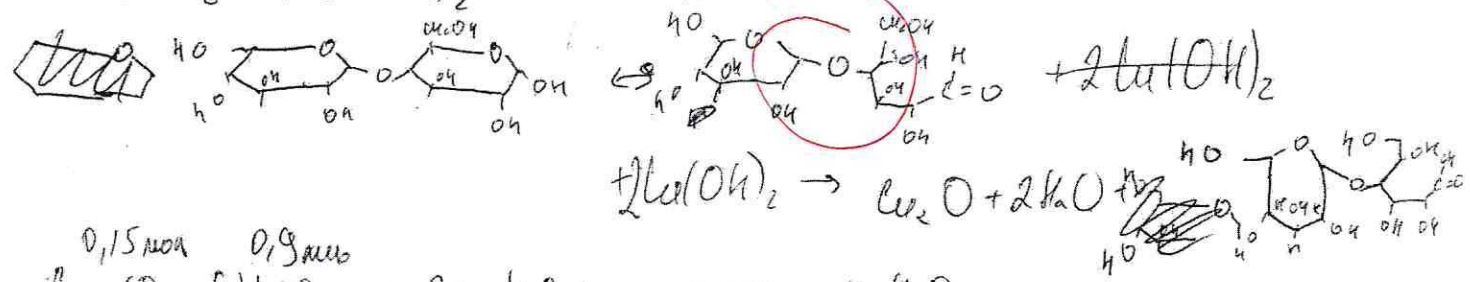
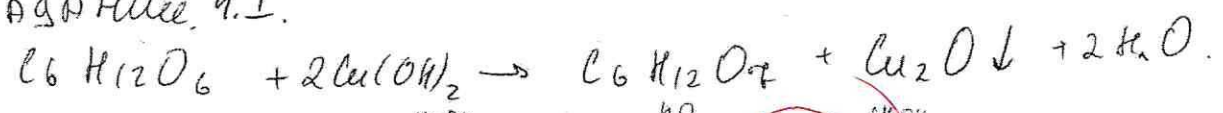
**СЕЧЕНОВСКИЙ
УНИВЕРСИТЕТ**

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Задача 8.1



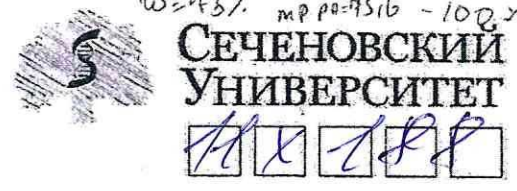
Задача 4.1



$m = 75,6 \text{ г}$ $m(\text{HNO}_3) = 75\%$
 $\omega = 95\%$ $m \text{ р-ра} = 75,6 - 10 \text{ г}$

$m(\text{HNO}_3) \cdot \frac{75 \cdot 95,6}{100} = 56,7 \text{ г}$

$\nu(\text{HNO}_3) = \frac{m(\text{HNO}_3)}{M(\text{HNO}_3)} = \frac{56,7 \text{ г}}{63 \text{ г/моль}} = 0,9 \text{ моль}$
 $\frac{\nu(\text{HNO}_3)}{\nu(\text{Cu}_2\text{O})} = \frac{6}{1} = \frac{0,9}{\nu(\text{Cu}_2\text{O})} = \nu(\text{Cu}_2\text{O}) = \frac{0,9}{6} = 0,15 \text{ моль}$

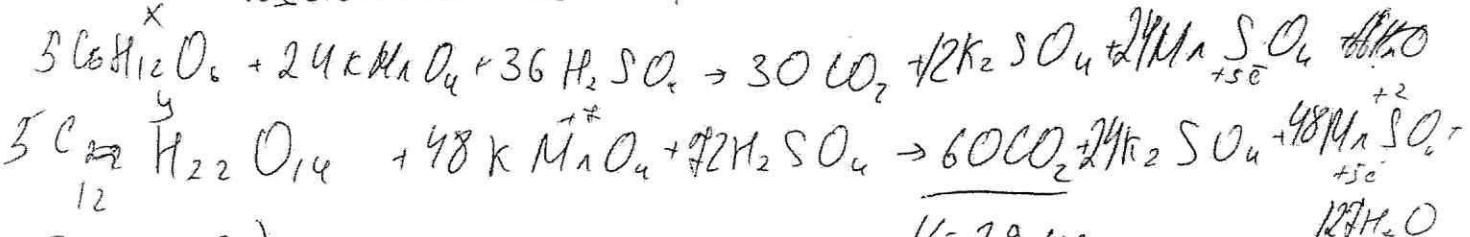


Задача 4.1 Прогноз массы

$$\frac{V(\text{углеводоб})}{V(\text{CO}_2)} = \frac{1}{1} \Rightarrow V(\text{углеводоб}) = 0,15 \text{ моль}$$

$$V(\text{C}_6\text{H}_{12}\text{O}_6) + V(\text{C}_{12}\text{H}_{22}\text{O}_{14}) = 0,15 \text{ моль}$$

моль C₆H₁₂O₆ = x моль моль C₁₂H₂₂O₁₄ = y моль



$$\frac{V(\text{C}_6\text{H}_{12}\text{O}_6)}{V(\text{CO}_2)} = \frac{5}{30} = \frac{x}{6x} = 6x \text{ моль}$$

$$\frac{V(\text{C}_{12}\text{H}_{22}\text{O}_{14})}{V(\text{CO}_2)} = \frac{5}{60} = \frac{y}{12y} = 12y \text{ моль}$$

$$6x + 12y = 1,2$$

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

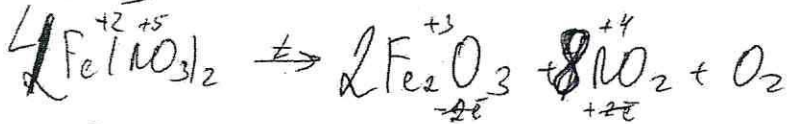
$$\begin{aligned} x &= 0,1 \text{ м (углеводоб)} = 180 \cdot 0,1 = 34,2 \text{ г} \\ y &= 0,05 \end{aligned}$$

35,1 г

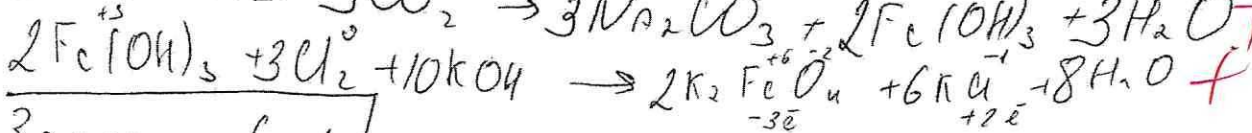
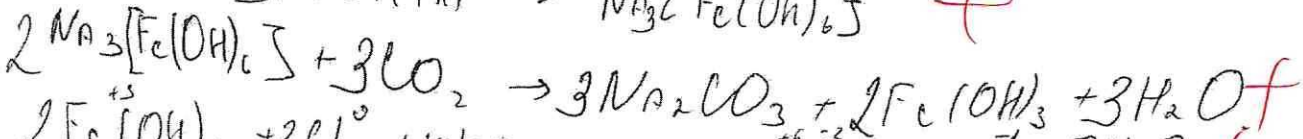
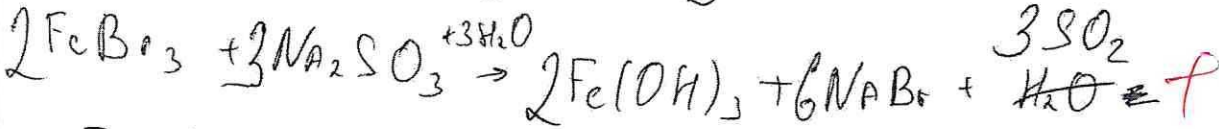
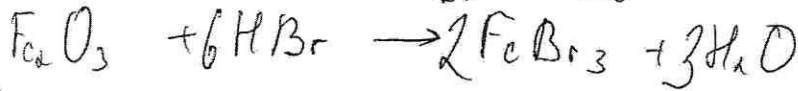
$$\begin{aligned} V &= 29,42 \text{ л} \\ P &= 101 \text{ кПа} \\ R &= 8,314 \\ T &= 25 + 273 = 298 \text{ К} \end{aligned} \quad \left. \vphantom{\begin{aligned} V \\ P \\ R \\ T \end{aligned}} \right\} V = \frac{PV}{RT}$$

$$\frac{101 \cdot 29,42}{8,314 \cdot 298} = 1,2$$

Задача 4.1



- X₁ - Fe₂O₃
- X₂ - Fe(OH)₃
- X₃ - Na₂[Fe(OH)₆]
- X₄ - K₂FeO₄



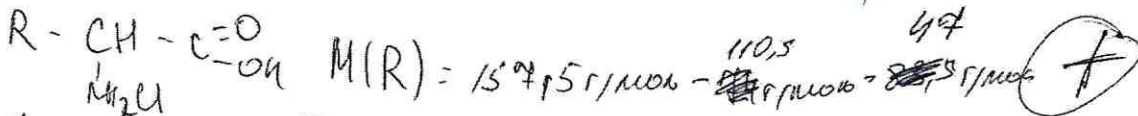
Задача 6.1

ω(C) = 0,2254 в 1 Аминокислоте.

Масса (C) была 1 атом.

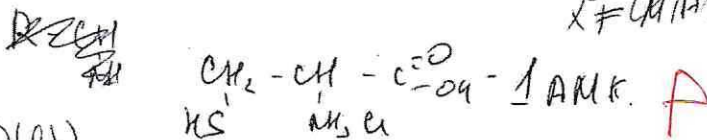
$$0,2254 = \frac{35,5}{x}$$

$$x = M(\text{АМК}) = \frac{35,5}{0,2254} = 157,5 \text{ г/моль}$$



Масса кислорода 2 атома

$$0,2254 \cdot 157,5 = 35,5 \text{ г/моль}$$



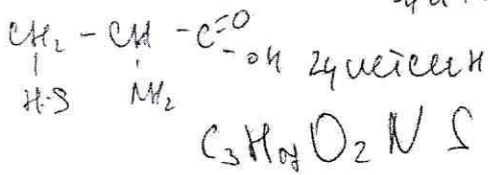
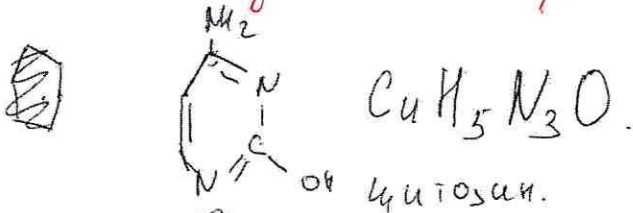
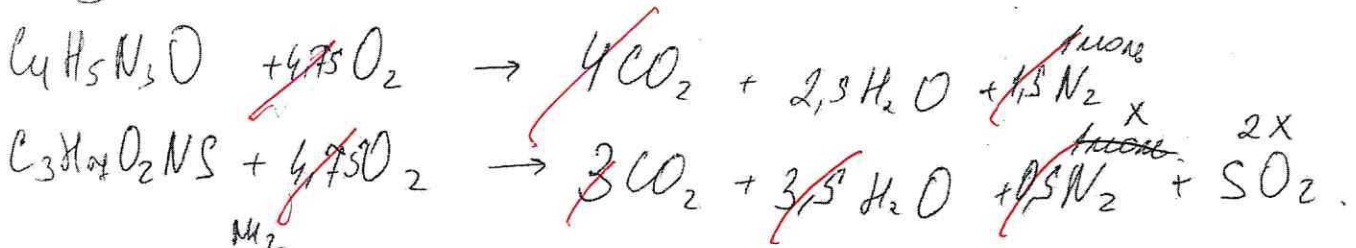
ω(C) = 0,105498 во 2 Аминокислоте

формула?

число?



Задачи 9.1

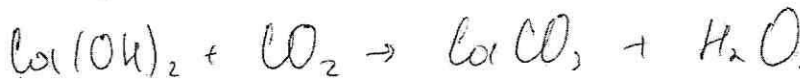


$$\frac{V(N_2)_1}{V(SO_2)_2 + V(N_2)_2} = 1$$

Пусть $V(N_2)_1 = 22,4n \Rightarrow V = \frac{V}{V_m} = \frac{22,4n}{22,4 \text{ л/моль}} = n$ моль

$$\Rightarrow V(N_2)_2 + V(SO_2)_2 = 1 \text{ моль}$$

$$(V(N_2)_2 + V(SO_2)_2) = 22,4 \text{ л}$$



$$\frac{V(CO_2)_1}{V(N_2)_1} = \frac{4}{1,5} = \frac{V(CO_2)_1}{1} \Rightarrow V(CO_2)_1 = 2,667 \text{ моль}$$

$$\frac{V(CO_2)_1}{V(CaCO_3)_2} = \frac{1}{1} \Rightarrow V(Ca(OH)_2)_1 = 2,667 \text{ моль}$$

$m(CaCO_3)_1 = V \cdot M = 266,7 \text{ г}$

Пусть $V(N_2)_2 = 0,5x$ моль $\Rightarrow \frac{V(N_2)_2}{V(SO_2)_2} = \frac{0,5}{1} = \frac{0,5x}{x}$

$$0,5x + x = 1$$

$$1,5x = 1$$

$$\frac{V(N_2)_2}{V(CO_2)_2} = \frac{0,5}{3} = \frac{x}{0,6667 \text{ моль}} \Rightarrow V(CO_2)_2 = 4 \text{ моль}$$

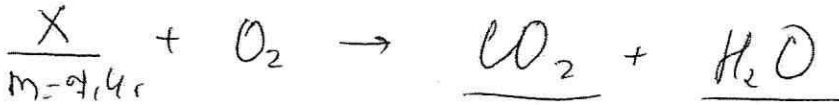


$$\frac{V(CO_2)_2}{V(CaCO_3)_2} = \frac{1}{1} = \frac{4}{V(CaCO_3)_2} \Rightarrow V(CaCO_3)_2 = 4 \text{ моль}$$

$m(CaCO_3)_2 = V \cdot M = 4 \cdot 100 \text{ г/моль} = 400 \text{ г}$

$$\frac{m(CaCO_3)_2}{m(CaCO_3)_1} = \frac{400 \text{ г}}{266,7 \text{ г}} = 1,5$$

Задача 2.1



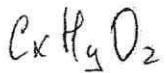
$$V = 8,96\text{ л} \quad m = 9\text{ г}$$

$$\nu(\text{CO}_2) = \frac{V}{V_m} = \frac{8,96\text{ л}}{22,4\text{ л/моль}} = 0,4\text{ моль} \quad \nu = \frac{m}{M} = \frac{9\text{ г}}{18\text{ г/моль}} = 0,5\text{ моль}$$

$$\nu(\text{C}) = \nu(\text{CO}_2) \cdot 1 = 0,4\text{ моль} \quad \nu(\text{H}) = \nu(\text{H}_2\text{O}) \cdot 2 = 0,5\text{ моль} \cdot 2 = 1\text{ моль}$$

$$m(\text{C}) = \nu \cdot M = 0,4\text{ моль} \cdot 12\text{ г/моль} = 4,8\text{ г} \quad m(\text{H}) = \nu \cdot M = 1 \cdot 1\text{ г/моль} = 1\text{ г}$$

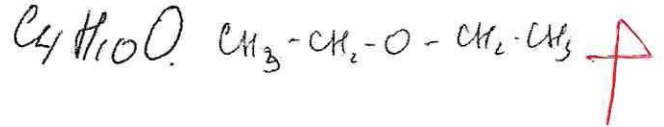
Проверка на кислород $m(X) - m(\text{C}) - m(\text{H}) = m(\text{O})$



$$x:y:z = 0,4:1:0,1 = 4:10:1$$

$$4,4 - 4,8 - 1 = 1,6\text{ г}$$

$$\nu(\text{O}) = \frac{m(\text{O})}{M(\text{O})} = \frac{1,6\text{ г}}{16\text{ г/моль}} = 0,1\text{ моль}$$



$$m = 10\text{ г} \quad V = 0,09\text{ л}$$

$$c = 2,75\text{ М} \quad m(\text{NaOH}) = \nu \cdot M = 40\text{ г/моль} \cdot 0,25025 = 10,01\text{ г}$$

$$c = \frac{\nu}{V} \Rightarrow \nu = c \cdot V = 2,75 \cdot 0,09 = 0,25025\text{ моль}$$

$\omega(\text{Na})$ в неорг. пробы = 0,45

реакция?



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