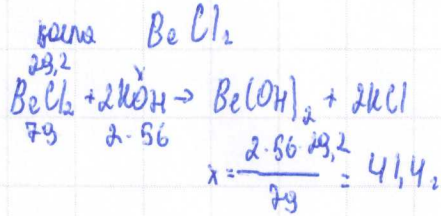
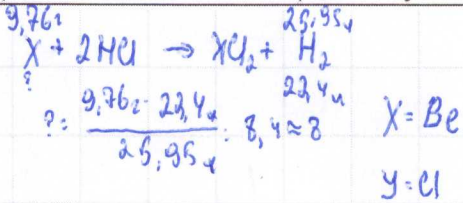


$$n_1. m(\text{сөлме}) = 29,22$$

$$V(\text{H}_2) = 25,95 \text{ л}$$

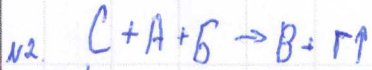
$$m_2(\text{сөлме}) = 29,22 - 19,442 = 9,762$$

$$m_3(\text{сөлме}) = 29,22 + 28,42 = 57,632$$



$$\frac{41,4 - 25}{x - 100} = \frac{165,6}{x - 100}$$

$$V = \frac{m}{\rho} = \frac{165,6}{1,185} = 140 \text{ мл}$$



қарым Б - малом тми 1 ж. туғанды -  $\text{Cl}_2$

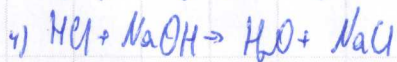
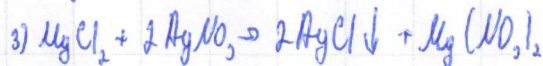
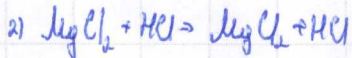
В - сульфид, белария тм. -  $\text{MnCl}_2$

Г - ұлы газ -  $\text{CO}$   $C \xrightarrow[\text{H}]{\text{O}_2} \text{CO}$

$$n = \text{MnCl}_2 \cdot 2\text{H}_2\text{O} \quad n = 2$$

$$X = \text{Mn}$$

$$n_3. 1. \text{MgCl}_2 \quad M_r = 2 \cdot 25,5 + 24 = 95 \quad \omega = \frac{2 \cdot 25,5}{95} \cdot 100\% = 74,74$$



3. 1)  $\text{pH} < 7$  - қосықпен ерті

$\text{pH} = 7$  - белгісіз ерті

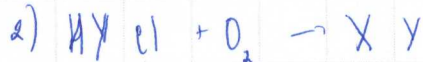
$$m_1 (\text{сммес}) = 29.20_1$$

$$V(H_2) = 25.95_1$$

$$m_2 (\text{сммес}) = 19.44_1$$

$$m_3 (\text{сммес}) = 28.43_2$$

Несетмі: X-Y-?

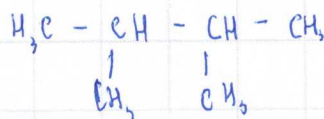
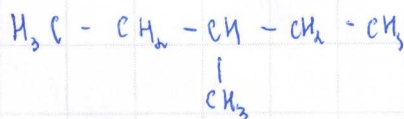


$$Q_{\text{см}} = m_1 + m_2 + m_3 = 77.07$$

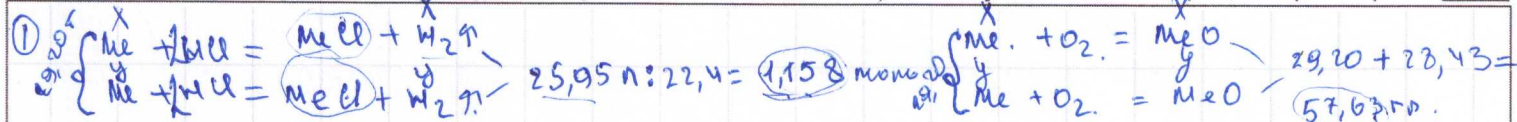
$$n(H_2) = \frac{25.95}{22.4} = 1.158_2$$

$C_6H_{14}$

$$p \cdot V_m = 3.75 \cdot 22.4 = 84 \text{ г/мол}$$



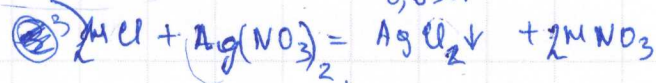
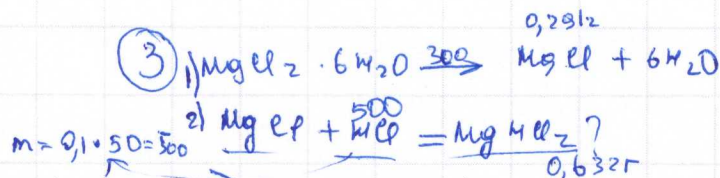
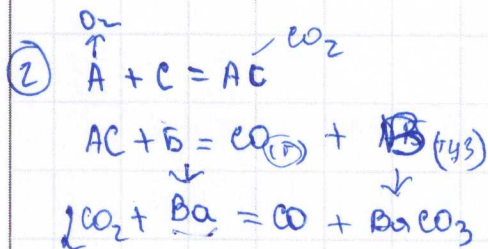




$$\begin{cases} x + y = 29,20 \text{ г} \\ x + y = 1,158 \text{ м} \end{cases}$$

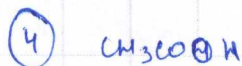
$$29,20 - 19,44 = 9,76 \text{ г (MeCl)}$$

$$\begin{cases} x + y = 29,20 \text{ г.} \\ x + y = 57,63 \text{ г.} \end{cases}$$



$$1. w = \frac{71}{95} \cdot 100\% = 74,7\%$$

$$m = 17,0 \cdot 0,05 = 4) \text{MCl} + \text{NaOH}^{0,6}$$

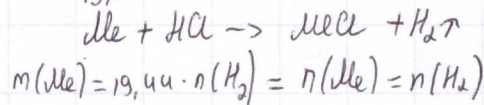
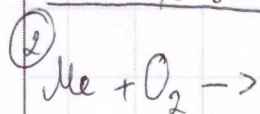


$$1) \begin{aligned} m_{\text{қоспа}} &= 29,20 \text{ г} \\ m_{\text{қоспа}} &= 9,76 \text{ г} \\ \text{яғни } n/2 \text{ қоспа} \end{aligned}$$

$$\textcircled{1} n(\text{H}_2) = \frac{P \cdot V}{R \cdot T} = \frac{1 \cdot 25,95}{20 \cdot 8,3} \quad P \cdot V = R \cdot T \cdot n \quad \bullet 2 \text{ есеп.}$$

$$= \frac{10,13 \cdot 25,95}{20 \cdot 8,3} = \frac{2628,735}{166} = \frac{1 \cdot 25,95}{166} = 0,15632 \text{ моль}$$

$$p_{\text{қоспа}} = 10,13 \text{ кПа}$$

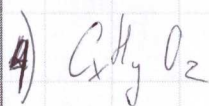


$$m(\text{Me}) = 19,44 \cdot n(\text{H}_2) = n(\text{Me}) = n(\text{H}_2)$$

$$m(\text{Me}) = 3,03 \text{ г}$$

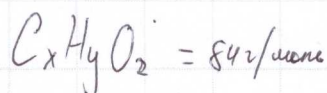
$$\omega = \frac{3}{29,2} = 10,27\%$$

• 4 есеп.



$$p = 3,75 \text{ г/л}$$

$$m = V \cdot p = 22,4 \cdot 3,75 = 84$$



$$x : y : z = 12 : 1 : 16$$

$$84 : 29 = 2,89 \approx 3$$

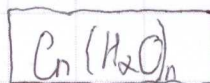
глюкоза цукроз

глюкоза

фруктоза

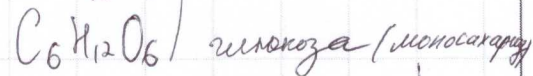
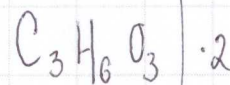
кетоноспирт

(2 H)



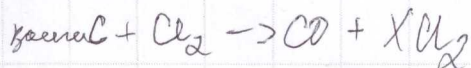
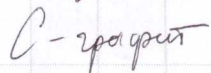
$$12 + 16n = 84$$

$$n = 2,8$$

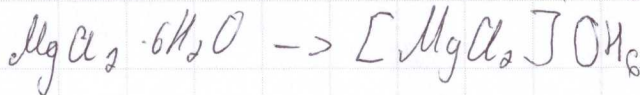


↓  
оптимальная  
измерение  
тисси.

• 2 есеп.



• 3 есеп.





Задача №1

1. Na - 2 доки, Li - 1 док

2. He - 2 док, 12,0 мл

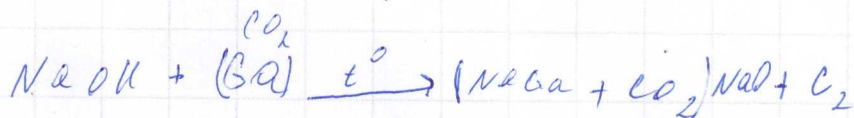
Задача №2

NaOH, C,  $\text{CO}_2$ ,  $\text{KMnO}_4$

2)  $\text{CH}_3 - \text{CH} - \overset{\text{O}}{\parallel}{\text{C}}$ ,  $\text{CO}_2$ ,  $\text{KMnO}_4$

X =  $\text{KMnSO}_4$

n = 4

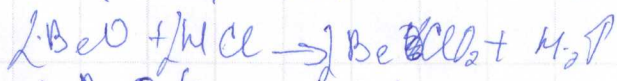
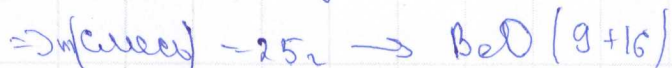
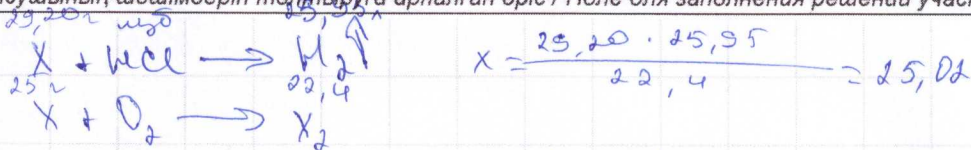


Задача №4

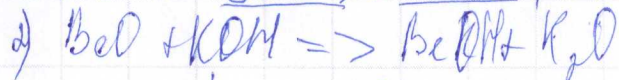
1.  $\text{BrO}_2$

2.  $\text{Br}_2\text{OH}$ ,  $\text{Br}_2\text{Cl}$

3.

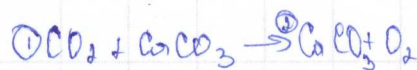
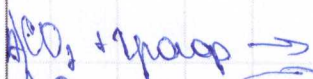


1)  $\text{BeO} (\text{Be} - 31\%) \text{O} = 56\%$ ; осм. - гр. бба)



$\downarrow$   
25%  $\text{KOH} = 225,1 \text{ - грам растворенный}$

№2

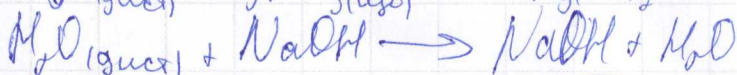
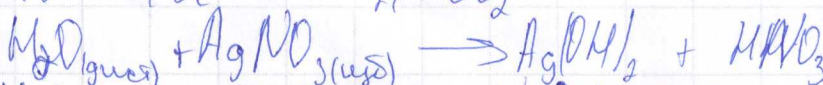


$\text{Cl:Cl}$

№3



$\text{Cl} = 97,2\%$



3)  $\text{PM}(\text{HCl}) = 36,5 \cdot 0,1 = 3,65$

$\text{PM}(\text{NaOH}) = 40 \cdot 0,1 = 4$

4)

№4

1)  $\text{C}_4\text{H}_{10}$  изомеры: метанол-1, метанол-2, метанол-3, метанол-4, метанол

2)  $\text{C}_4\text{H}_{10} = \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ ;  $\text{C}_4\text{H}_8 = \text{CH}_2 = \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ ;  $\text{C}_4\text{H}_6 = \text{CH}_2 = \text{CH} = \text{CH} - \text{CH}_3$

3)  $\text{C}_4\text{H}_{10} = \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

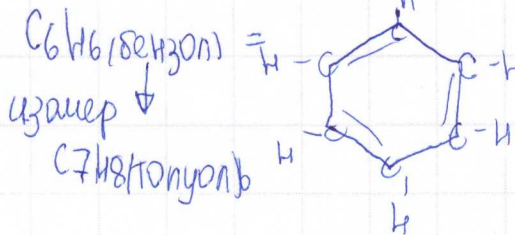
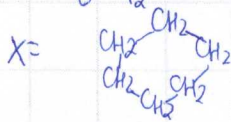
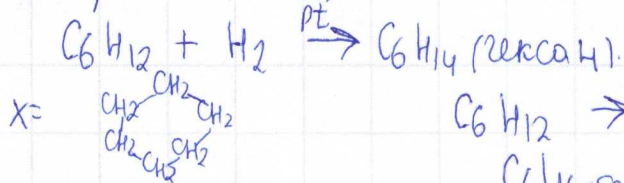
4)  $\text{C}_4\text{H}_{10} = \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$



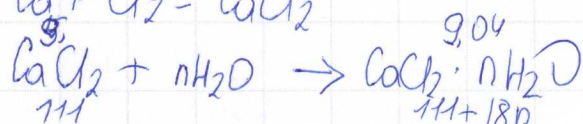
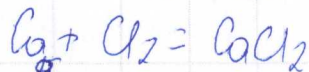
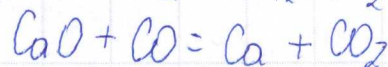
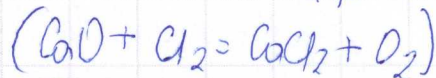
ЕСЕП №4. Белгісіз көмірсутек.

$$1) m = \rho \cdot V \quad m = 3,75 \text{ г/л} \cdot 22,4 = 84 \text{ гр.}$$

$$C_x H_y = 84 \Rightarrow C_6 H_{12} \text{ (циклогексан)}$$



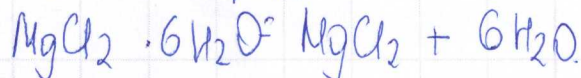
ЕСЕП №2. Белгісіз заттар.



$$111,9,04 = 5 \cdot (111 + 18n)$$

$$n = 11,2 = 11$$

ЕСЕП №3. Бишофит.



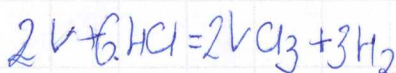
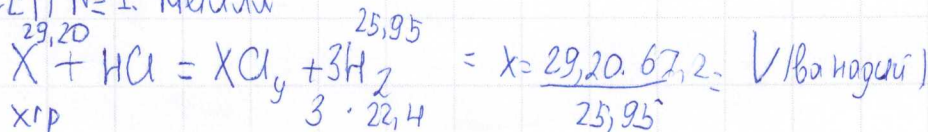
$$1. MgCl_2 = 95 \text{ г/моль}$$

$$\frac{71}{95} \cdot 100\% = 74,73\%$$

$$50 \text{ мл } 0,1 \text{ M HCl} = c = \frac{n}{V}$$

$$2 \text{ реакция } - 0,1 \text{ M} = \frac{n}{V} = \frac{0,1 \text{ M} \cdot n}{50} \Rightarrow n = 5 \quad m(HCl) = 5 \cdot 36,5 = 182,5 \text{ гр}$$

ЕСЕП №1. Металл



Есеп №1. Металдар қоспасы.

$$m(z) = 29,202$$

$$V(H_2) = 25,95 л$$

$$m(z) = x - 19,442$$

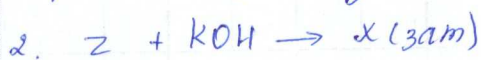
$$m(z) = x + 28,432$$

$$\begin{array}{l} x + y = z \quad 29,202 \\ 9,762 \quad y \quad 25,951 \\ z + HCl \rightarrow k + H_2 \uparrow \\ 57,68 \quad 22,4 л \\ z + O_2 \rightarrow \end{array}$$

$$25,95 - 19,44 = 9,762 (+HCl)$$

$$25,95 + 28,43 = 54,682 (+O_2)$$

1. Қоспадағы жай заттарды анықтап, олардың молекулалық формулаларын анықтаңыз.



$$\rho = 1,185 \text{ г/мл}$$

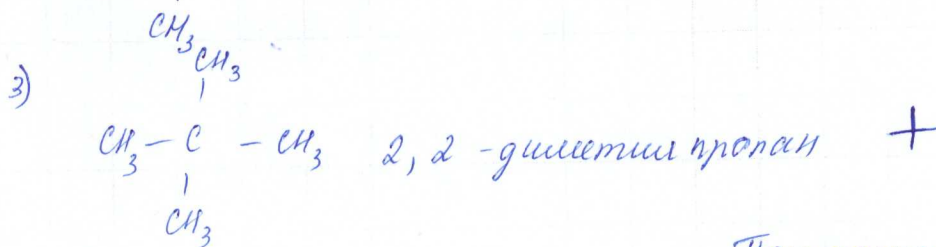
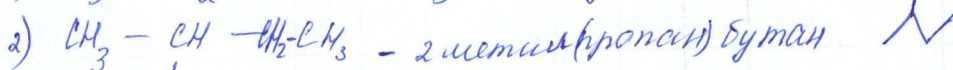
$$w = 25\% \text{ (сілті)}$$

Есеп №4. Белгісіз көшірмелік

X көшірмеліктің 5 ж. бұрынғылығы мен 3,75 г/л - ге тең. Ол  $KMnO_4$  түссіздендірмейді.

1) X заттың молекулалық формуласы:

$$C_5H_{10} \quad M_r = 70$$

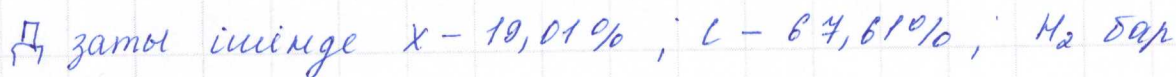
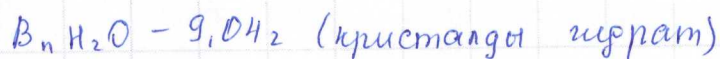
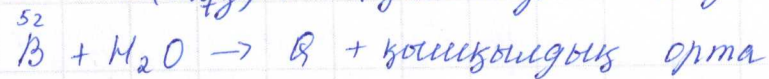
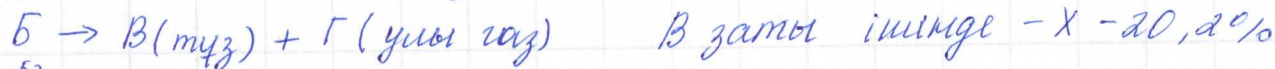
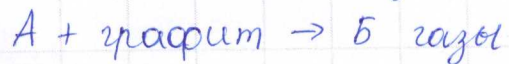


Пентанның 3 изомері бар.

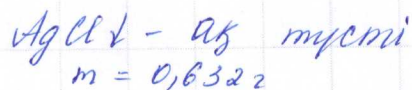
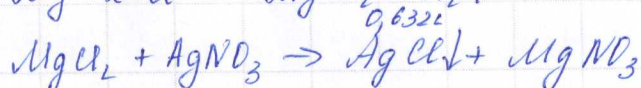
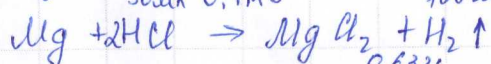
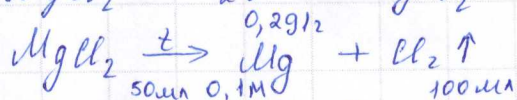
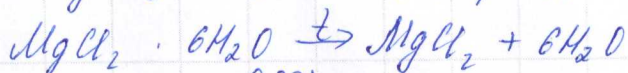
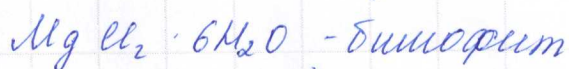




Есеп № 2 Белгісіз заттар



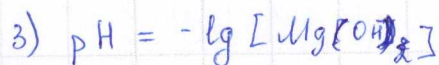
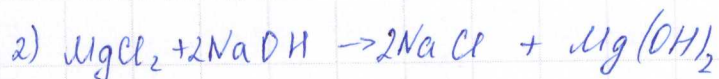
Есеп № 3. Бишофит

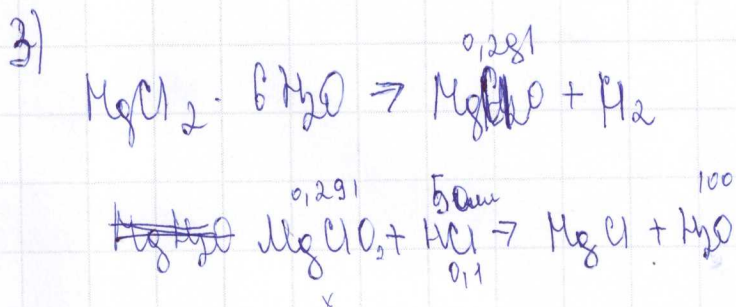
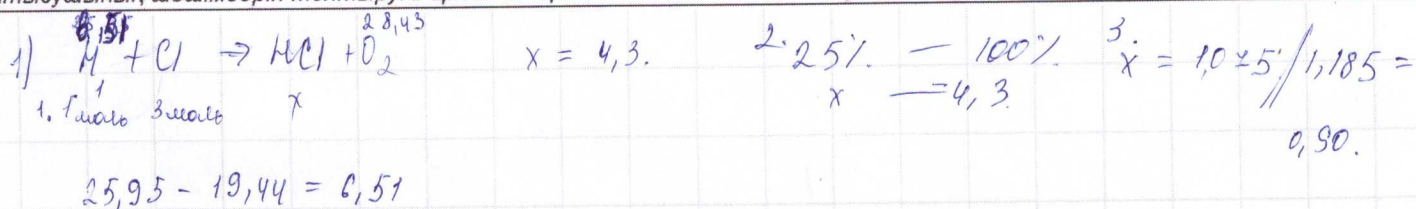


$$m = 0,6322$$

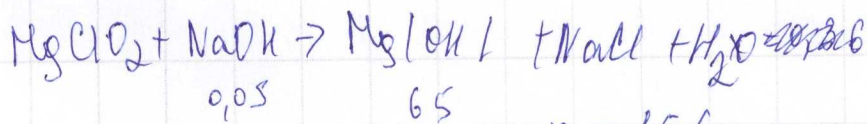
1)  $MgCl_2$  хлордың массалық үлесі:

$$Mr = 95. \quad \omega = \frac{71}{95} \cdot 100\% = 74,7\%$$



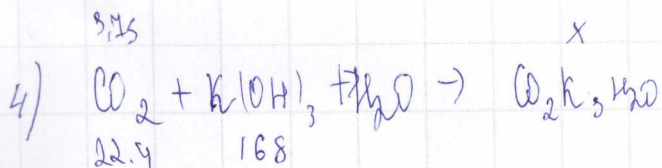


$x = 0,58 - 100$   
 $x = 0,932$        $x = 0,36$

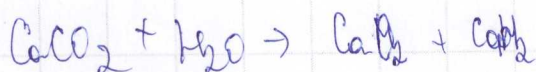
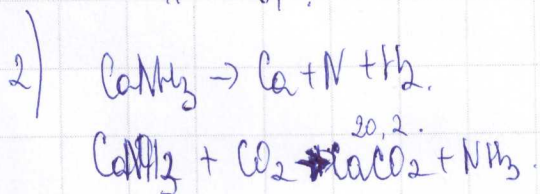


$x = 156$   
 $x = 100$   
 $MgCl_2 \cdot 6H_2O$   
 $118 \quad 18$

Бішефрит массасы.  
 $x = 655,5$



$x = 28,1$



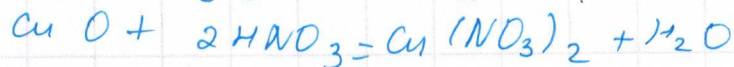


Есеп 2.

Егер жасыл түсті тұтақтардан болса онда оның ішінде мұнда қосылған бар деген сөз. Яғни ол мұнда  $\text{Cu(II)}$  гидроксиді  $\text{Cu(OH)}_2$ .

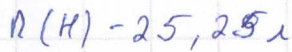
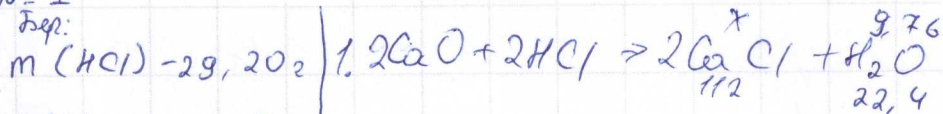
Б затта  $\text{HNO}_3$ Негізбен әрекеттескенде  $\text{Cu(NO}_3)_2$  тұзінеді.Бұл зат қыздырғанда  $\text{NO}_2$  және  $\text{O}_2$  же қара түсті  $\text{CuO}$  тұзінеді.

CuO қосылғанмен әрекеттескенде.

 $\text{Cu(NO}_3)_2$  яғни бұл B затта.A затта -  $\text{Cu(OH)}_2$ Б затта -  $\text{HNO}_3$ B затта -  $\text{Cu(NO}_3)_2$ Г затта -  $\text{NO}_2$ D затта -  $\text{O}_2$ .

№ 1

Бер:



V-?

$$n(2\text{CaCl}) = 112$$

$$29,20 - 19,44 = 9,76$$

$$x = \frac{112 \cdot 9,76}{22,4} = 48,8$$

$$2. \frac{4,185}{2,5\%} \cdot 100\% = 23,7 \text{ г}$$

№ 2

Б

Г

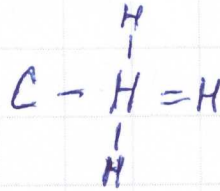
Х

п

Д

CO<sub>2</sub>CO<sub>3</sub>

Mg

H<sub>2</sub>OCH<sub>3</sub>

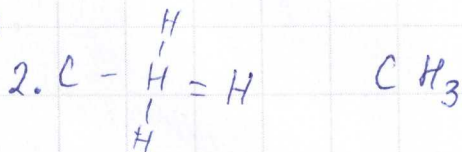
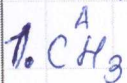
№ 3



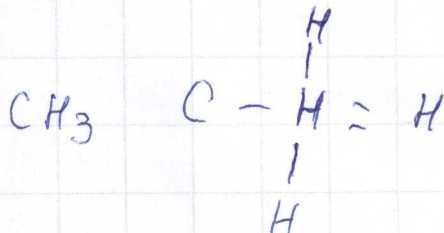
$$\text{M(C)} = 35,5$$

2.

№ 4



4.





№1

1) Na и Ag

2) да, болжамына

№2 А -  $Fe_2O_3$  В -  $Fe_3N_2$  X - NБ -  $N_2$  Г - CO n = 3Д -  $C_4H_9NH_2$  ;  $H_3C - CH_2 - \underset{\substack{| \\ NH_2}}{CH} - CH_3$ 

№3

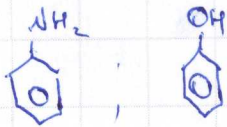
1. -

2.  $MgCl_2 \cdot 6H_2O \xrightarrow{+} MgCl_2 + 6H_2O$  Отыяғ:  $MgCl_2$ 

№4

1.  $C_6H_5NH_2$ 

2.



N1

$$m_1(+) = 29,202$$

$$V(H_2) = 25,95л$$

$$t = 20^\circ C$$

$$m_2 = m_1 - 19,442$$

$$m_3 = +28,432$$

N2

$$D = 100\% \rightarrow H_2 = 13,38\% \quad D = x + C + H_2$$

$$\omega(C) = 100 - 20,2\% = 79,8\%$$

$$C + H_2 \rightarrow \text{шешімі} + H_2 \quad x = \frac{5 \cdot 13,38}{79,8} = 0,832 \quad m(H_2)$$



Задача №4

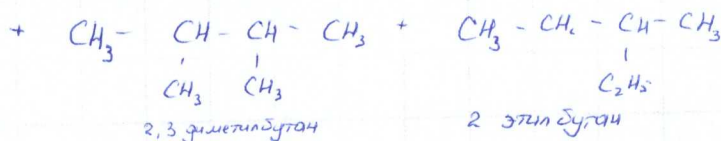
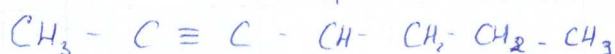
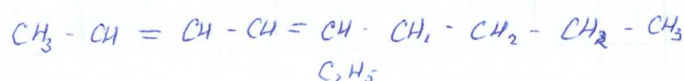
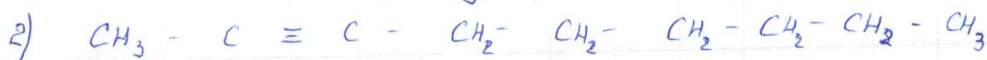
$$D_{\text{возд}} = 3,75 \text{ г/л}$$

C<sub>x</sub>H<sub>y</sub>

$$D = \frac{M_r(\text{вещ. в г})}{M_r(\text{возд})}$$

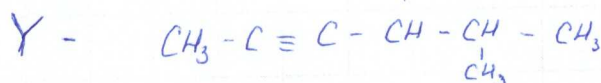
$$3,75 = \frac{M_r(\text{вещ. в г})}{29}$$

$$M_r(\text{вещ. в г}) = 3,75 \cdot 29 = 108,75$$

поскольку не обесцвечивается водный р-р KMnO<sub>4</sub> ⇒ алкинC<sub>n</sub>H<sub>2n-2</sub>1) C<sub>9</sub>H<sub>16</sub> - циклопный углеводород

2,3 диметилбутан

2 этилбутан



Задача №1

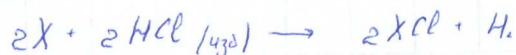
$$m(\text{смеси}) = 29,20 \text{ г}$$

$$V(\text{H}_2) = 25,95 \text{ л}$$

$$m_{\text{H}_2} = 19,44 \text{ г}$$

$$m_{\text{C}_2\text{H}_2} = 28,45 \text{ г}$$

$$\omega(\text{вещ. в б}) = ?$$



$$n(\text{H}_2) = \frac{25,95}{22,4} = 1,16 \text{ моль}$$

$$n(X) = 1,16 \cdot 2 = 2,32 \text{ моль}$$

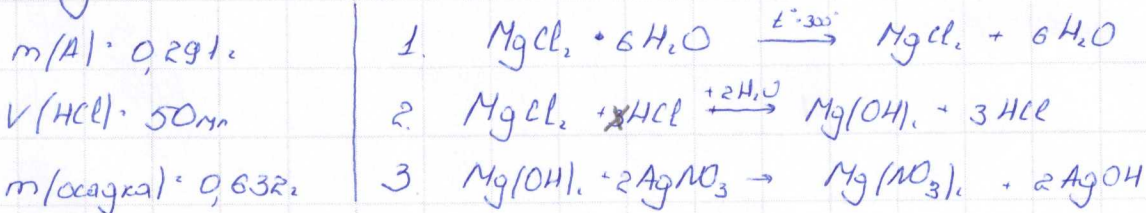
$$m = n \cdot M_r \quad 29,20 = 2,32 \cdot M_r \Rightarrow M_r = \frac{29,20}{2,32} = 12,58$$

$$m(\text{смеси})_1 = 29,20 - 19,44 = 9,76 \text{ г}$$

$$m(\text{смеси})_2 = 9,76 + 28,43 = 38,19 \text{ г}$$

⇒ Простое вещество - Li  $\omega(\text{Li}) = \frac{6,94}{29,20} \cdot 100 = 23,7\%$  $\omega(\text{Na}) = \frac{22,99}{29,20} = 78,3\%$  Ответ: Li, Na

Задание №3



$$n(\text{Mg(OH)}_2) = m(\text{HCl}) \cdot n(\text{MgCl}_2) = 0,1 \text{ моль}$$

$$n(\text{AgNO}_3) = 2(\text{Mg(OH)}_2) = 2 \cdot 0,1 = 0,2 \text{ моль} \Rightarrow m(\text{AgNO}_3) = 0,2 \cdot (108 + 14 + 16 \cdot 3) = 34 \text{ г}$$

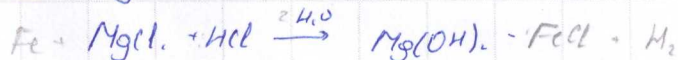
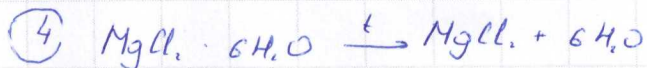
$$m(\text{HCl}) = 0,1 \cdot 36,5 = 3,65 \Rightarrow m_{\text{р-ра}} = 3,65 + 50 + 34 - 0,632 = 87,018 \text{ г}$$

$$m(\text{H}_2\text{O}) = V_{\text{р}} \cdot \rho_{\text{H}_2\text{O}} = 50 \cdot 1 = 50 \text{ г}$$

$$w = \frac{m(\text{вещ-во})}{m_{\text{р-ра}}} \cdot 100\%$$

$$w = \frac{M_r(\text{эл})}{M_r(\text{вещ-во})} \cdot 100\%$$

$$w(\text{Cl}_2) = \frac{2 \cdot M_r(\text{Cl}_2)}{M_r(\text{MgCl}_2)} \cdot 100\% \Rightarrow w(\text{Cl}_2) = \frac{2 \cdot 35,5}{95} \cdot 100 = 74,7\%$$

② Вещ-во А - MgCl<sub>2</sub>③ pH (HCl) < 7 ; pH (раствора А) > 7 ; pH (Mg(OH)<sub>2</sub>) > 7





$$m(\text{Me}_1 + \text{Me}_2) = 29,22$$

$$V(\text{H}_2)(20^\circ\text{C}; 1\text{атм}) = 25,95\text{л}$$

$$m(\text{Me}_1 + \text{Me}_2) = 19,442$$

$$m(\text{O}_2) = 28,432$$

$$1) \frac{V_2 P_2}{T_2} = \frac{V_1 P_1}{T_1} \quad V_1 = 25,95\text{л} \quad T_1 = 195^\circ\text{K} \quad P_1 = 1\text{атм}$$

$$V_2 = 3 \quad T_2 = 195^\circ\text{K} \quad P_2 = 1\text{атм}$$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2} \cdot \frac{25,95\text{л}}{195^\circ\text{K}} \cdot \frac{195^\circ\text{K}}{195^\circ\text{K}} \quad ; \quad V(\text{H}_2) = \frac{25,95 \cdot 195^\circ\text{K}}{195^\circ\text{K}} = 23,28\text{л}$$

$$2) n(\text{H}_2) = \frac{V}{V_m} = \frac{23,28\text{л}}{22,4\text{л}} = 1,04\text{моль} \quad - 2,08\text{моль H}$$

$$3) n(\text{O}_2) = \frac{m}{M(\text{O}_2)} = \frac{28,432}{32\text{г}} = 0,88\text{моль}$$

$$4) \begin{cases} x + y = 100 \\ x + 2y = 9,44\text{моль} \end{cases}$$

$$\begin{cases} x = 100 - y \\ 100 - y + 2y = 9,44\text{моль} \end{cases}$$

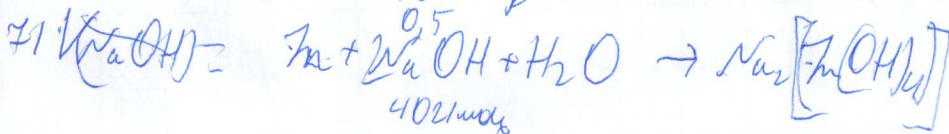
$$\begin{cases} x = 100 - 44,160 = 55,840 \\ y = 44,160; y = 44,160 \end{cases}$$

$$5) \frac{44,160}{100\%} = 44,16\% \quad ; \quad n(\text{H}_2) = \frac{55,84 \cdot n}{100\%} = \frac{55,84 \cdot 0,25}{100\%} = 0,1396\text{моль}$$

$$6) 0,14x + 0,25y = 0,22 \quad ; \quad 39,914 + 0,25 \cdot 0,25 = 29,22 - \text{верно}$$

$$x = \text{K}; y = \text{Ca} \quad a = \text{Mn}; b = \text{Zn} \quad M_1 = \text{Mn}; M_2 = \text{Zn}$$

$$6) m_{\text{Zn}} = n \cdot M = 0,25 \cdot 65,8 = 16,25$$



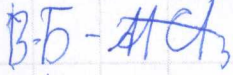
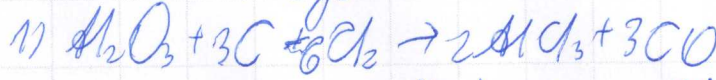
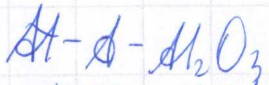
$$8) m(\text{Ca(OH)}_2) = 20\text{г}; m(\text{H}_2) = \frac{20 \cdot 200}{25} = 80\text{г}; V(\text{H}_2) = \frac{m}{\rho} = \frac{80\text{г}}{1,1852} = 67,5\text{л}$$

Отвѣт:  $\text{Me}_1 = 0,14\text{Mn} + 0,25\text{Zn}$

Табель шестидесяти растворится в 67,5 мл водорода.



## Задача №2



3)



$$n(\text{AlCl}_3) = \frac{m(\text{AlCl}_3)}{M(\text{AlCl}_3)} = \frac{133,5}{133,5} = 1 \text{ моль}$$

$$n(\text{AlCl}_3) = \frac{m(\text{AlCl}_3)}{M(\text{AlCl}_3)} = \frac{5(2)}{133,5(2 \text{ моля})} = 0,037 \text{ моль}$$

$$9,04 - 5 = 4,04 - \text{мл H}_2\text{O}$$

$$n(\text{H}_2\text{O}) = \frac{m(\text{H}_2\text{O})}{M(\text{H}_2\text{O})} = \frac{4,042}{18(2 \text{ моля})} = 0,224$$

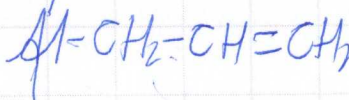
$$n(\text{H}_2\text{O}) = \frac{0,224}{0,037} = 6$$

$$2) m(\text{неаренны}) = \frac{m(\text{Al}_2\text{O}_3) \cdot 100\%}{100\%} = \frac{27(2) \cdot 19,01\%}{100\%} = 10,22(2)$$

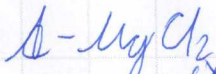
$$m(\text{C}) = \frac{m(\text{неаренны}) \cdot 100\%}{100\%} = \frac{10,22(2) \cdot 100\%}{100\%} = 9,62$$

$$n(\text{C}) = \frac{9,62}{12(2)} = 8$$

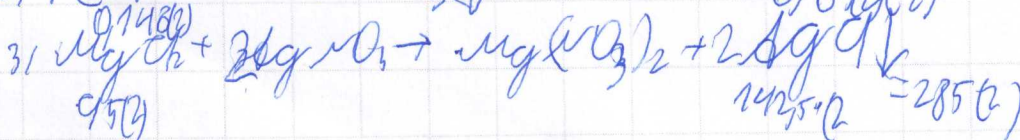
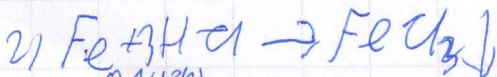
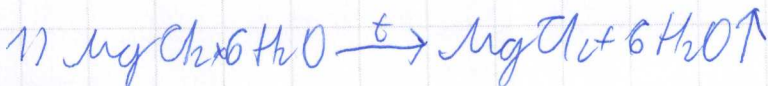
$$n(\text{H}) = \frac{142 - 27 - 96}{1} = 19$$



## Задача №3



$$\omega(\text{Cl}) = \frac{m(\text{Cl})}{M(\text{MgCl}_2)} = \frac{71(2)}{95} = 74,74\%$$



$$n(\text{MgCl}_2) = \frac{0,146}{95} = 0,0015 \text{ моль}$$

$$n(\text{AgCl}) = \frac{0,832(2)}{143,5(2)} = 0,0058$$

$$n(\text{AgCl}) = \frac{0,832(2)}{143,5(2)} = 0,0058$$

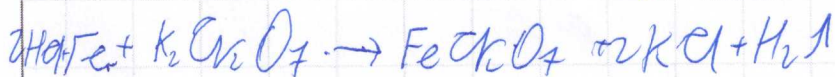




$$50,005 - 90006 = 0,00004 \text{ моль HCl}$$

$$n(\text{NaOH}) = \frac{V \cdot n}{1000 \text{ мл}} = \frac{10 \text{ мл} \cdot 0,05 \text{ M}}{1000} = 0,0005$$

$$5) \text{pH}(\text{0,1 M HCl}) = \text{pH}(\text{H}^+) = \text{lg}(\text{H}^+) = \text{lg} 0,1 = -1; \text{pH} = 2$$



$$n(\text{K}_2\text{Cr}_2\text{O}_7) = \frac{0,0134 \cdot 0,1 \text{ M}}{1000 \text{ мл}} = 0,000134 \text{ моль} = n(\text{Fe})$$

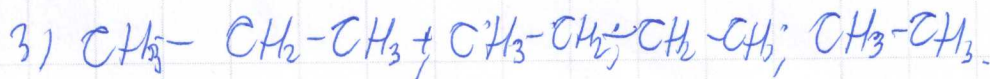
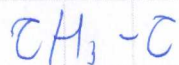
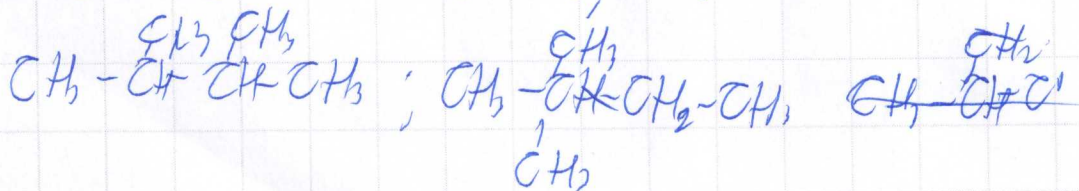
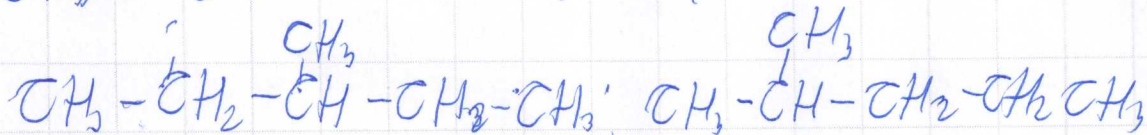
$$n(\text{Fe}) = \frac{100 \text{ мл} \cdot 0,000134 \text{ моль}}{10 \text{ мл}} = 0,00134$$

$$M(\text{Fe}) = n \cdot M = 0,00134 \cdot 56 \text{ (г/моль)} = 0,075$$

$$\omega(\text{Fe}) = \frac{m(\text{Fe})}{m(\text{смаг})} = \frac{0,075}{102} = 0,735\%$$

Задание №4

$$1) M = \rho \cdot V = 22,4 \cdot 3,45 = 77,3 \text{ г/моль}; z = \frac{84 - 2}{14} = \frac{82}{14} = 6 - \text{C}_6\text{H}_{14}$$





Дано

$$m(\text{сесен}) = 29,70$$

$$V_{\text{догаз}}^{(H)} = 75,95$$

$$m_1(\text{сесен}) = m - 25,95$$

$$m_2(\text{сесен}) = m + 28,472$$

$$m_1 = 29,70 - 25,95 = 3,75 \text{ г}$$

$$m_2 = 29,70 + 28,43 = 58,13$$



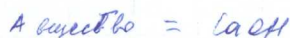
$$n = \frac{m}{M}$$



1 сәйкесіне I

2 сәйкесіне Ag

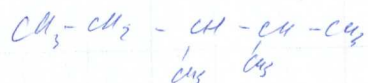
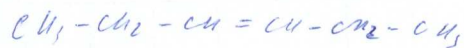
2.2



2.3



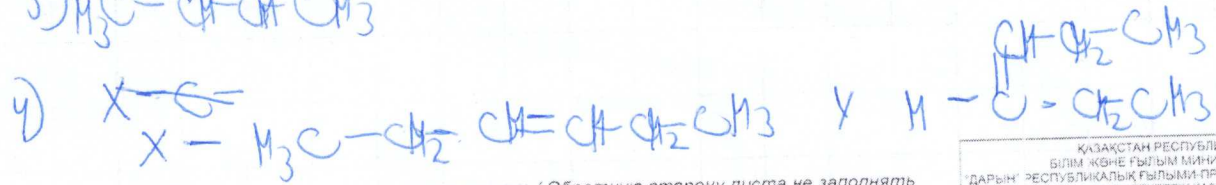
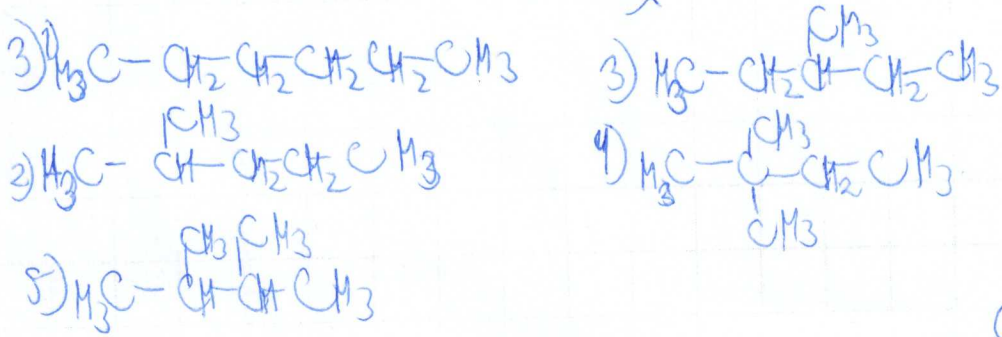
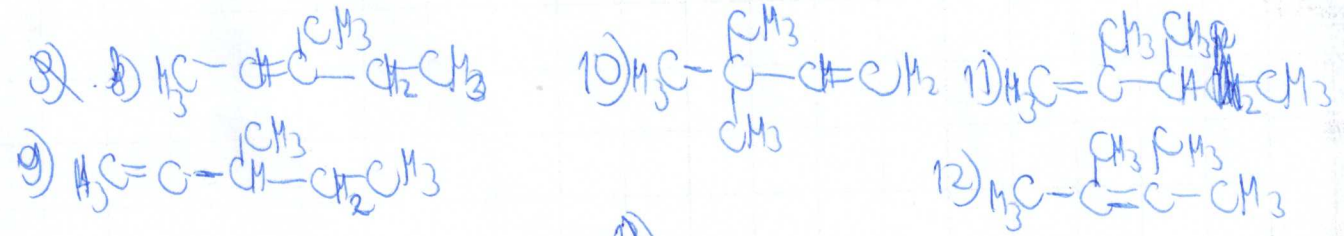
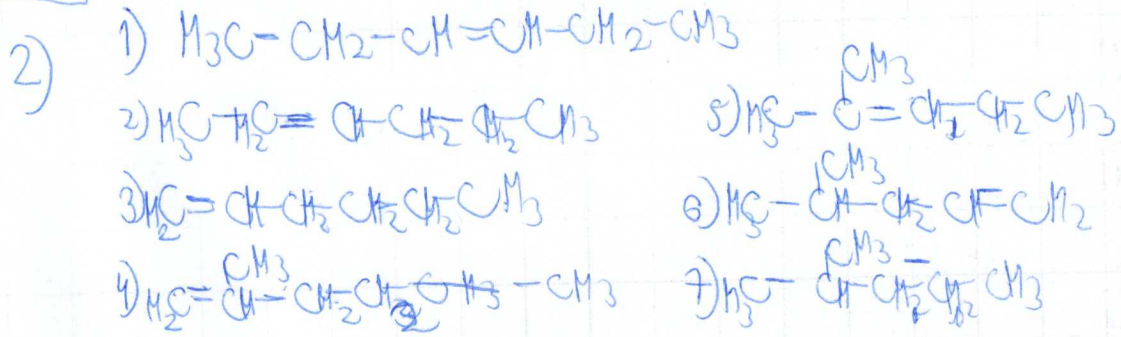
2.4



- 2) A  
B) Cl<sub>2</sub>  
B)  
D) ∞  
A)

1) Дано  $M(C_xH_y) = 3,75 \cdot 22,4 \text{ л/моль} = 84 \text{ г/моль}$

$C_xH_y$	$\frac{84}{12} = 7$	$\frac{12}{1} = 12$	$C_6H_{12}$ - циклен
Даны	7	12	
Усу			





3.1 HCl

$$M_r = 1 + 35,5 = 36,5$$

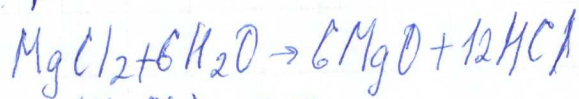
$$w(\text{Cl}) = \frac{35,5}{36,5} \cdot 100 = 97,2\%$$

3.2



PH

3.3



$$M_r(\text{MgCl}_2) = 95$$

$$w(\text{Mg}) = \frac{24}{95} \cdot 100\% = 25,2\%$$

4.1

X

Қатысушының шешімдерін толтыруға арналған өріс / Поле для заполнения решений участника

N1.  
Берілгені  
 $m(x+y) = 29,20г$   
 $V(H_2) = 29,5л$

---

Т/К  
1) x - ?  
y - ?  
2)  $V(KOH) = ?$   
 $n(KOH) = 25\%$   
 $\rho(KOH) = 1,185г$

Шешуі: ①  
1)  $x + HCl \rightarrow xCl + H_2 \uparrow$   
 $y + HCl \rightarrow yCl + H_2 \uparrow$   
 $m_1 = 29,20 - 19,44 = 9,81(г)$   
2)  $x + O_2(арт.м) \rightarrow xO$   
 $y + O_2(арт.м) \rightarrow yO$   
 $m_2 = 29,20 + 28,43 = 58,38(г)$   
 $n(H_2) = \frac{29,20}{22,4} \approx 1,306$   
 $xO + yO = 58,38$

②  $M(KOH) = 39 + 16 + 1 = 56г/моль$   
 $V = n \cdot V_m \cdot \rho = 1362$   
 $V = 1,385 л/м \cdot 0,25 \cdot 1,185$   
 $\frac{1362}{1000} = 1,362 л$

$n : 2 : V(KOH) = 1,362 л$

N2  
Бер:  
 $m(B) = 5г$   
 $m(B \cdot nH_2O) = 9,04г$   
Дзамет:  
 $n(X) = 20,2\%$   
Дзамет:  
 $n(X) = 19,01\%$   
 $n(C) = 67,61\%$   
 $n(H) = 13,38\%$

Б газ -  $Cl_2$  - хлор, катализатор  
Г газ -  $CO$  - угор.  
Д замет:  
 $n(C) = \frac{67,61}{12} = 5,634$   
 $n(H) = \frac{13,38}{1} = 13,38$   
 $A_3 + C \rightarrow A_3C$   
 $A_3C + Cl_2 \rightarrow A_3Cl + CO$   
B замет

A замет - бинария  
B замет - бинария

Т/К  
 $A, B, C, D, X - ?$

N3.  
Берілгені:  
Бинария  
 $MgCl_2 \cdot 6H_2O$

$MgCl_2 \cdot 6H_2O \xrightarrow{300^\circ C} MgCl_2 + 6H_2O \leftarrow \text{бинария}$   
А бинария -  $MgCl_2$   
 $m(MgCl_2) = 0,291г$   
 $M(MgCl_2) = 24 + (35,5 \cdot 2) = 95г/моль$   
 $n = \frac{0,291г}{95г/моль} \approx 0,003 моль$

$MgCl_2 + HCl \rightarrow Mg$   
 $V(HCl) = 10 мл$   
 $C(HCl) = 0,1 M$   
 $n = V \cdot C = 10 \cdot 0,1 = 1$   
 $m = n \cdot M = 1 \cdot 182,5 = 182,5$

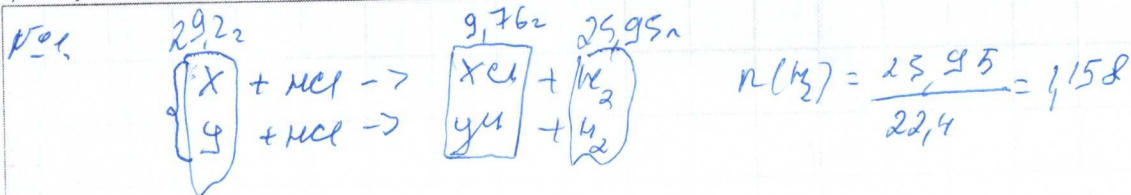
$m(HCl) = 182,5г$



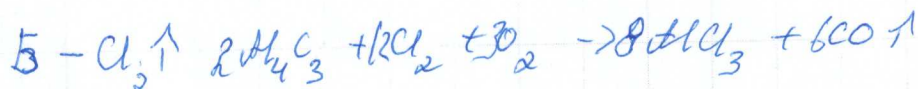




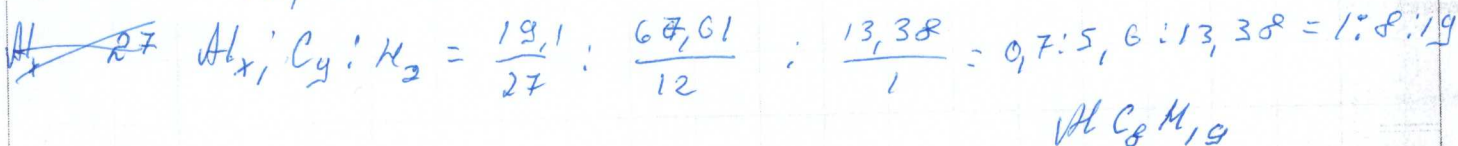




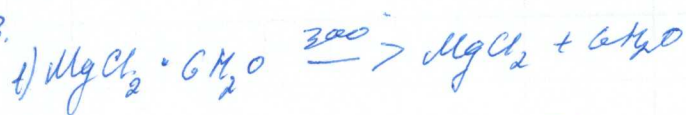
№2



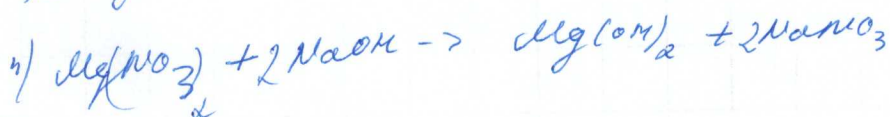
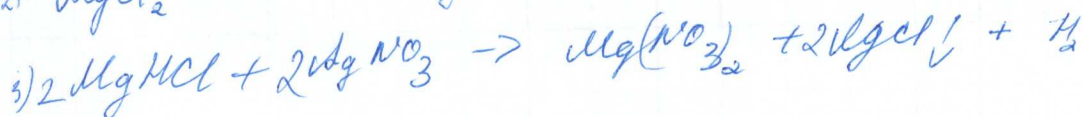
$$\omega(\text{Al}) = \frac{27}{133,5} \cdot 100\% = 20,2\% \quad X - \text{Al} \quad \text{AlCl}_3 \cdot 7\text{H}_2\text{O}$$



№3.

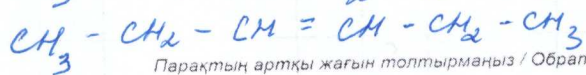
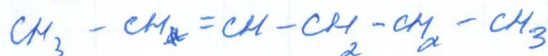
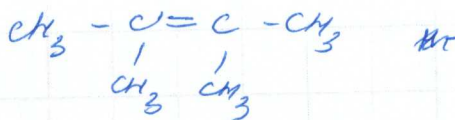
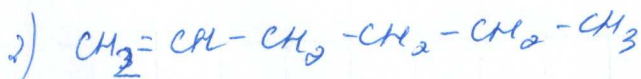
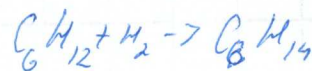


$$A - \text{MgCl}_2 \quad \omega(\text{Cl}) = \frac{71}{95} \cdot 100\% \approx 75\%$$



№4.

$$1) X = \text{C}_6\text{H}_{12} \quad n = M = \rho \cdot V = 3,75 \cdot 23,4 = 89$$



Парақтың артқы жағын толтырмаңыз / Обратную сторону листа не заполнять

N1.

Берілгені:

$$m(\text{кислота}) = 29,22$$

$$V(\text{H}_2) = 25,95 \text{ л}$$

$$m(\text{кислота}) = 19,442$$

$$m_3(\text{кислота}) = 28,432$$

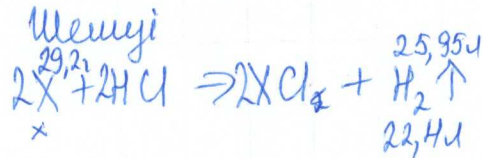
$$\rho(\text{KOH}) = 1,185 \text{ г/мл}$$

$$w(\text{KOH}) = 25\%$$

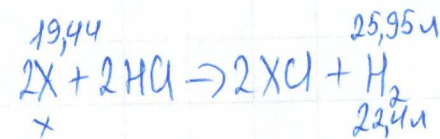
Табу керек:

зам<sub>1</sub> - ?зам<sub>2</sub> - ?

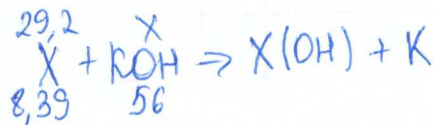
V(KOH) - ?



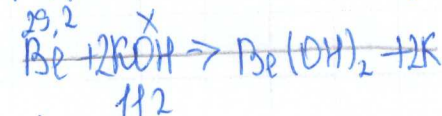
$$X = \frac{29,22 \cdot 22,4 \text{ л}}{25,95 \text{ л}} = 25,22$$



$$2X = \frac{19,44 \cdot 22,4}{25,95} = 16,78 \Rightarrow X = \frac{16,78}{2} = 8,39 \text{ - Be}$$



$$M_r(\text{KOH}) = 39 + 16 + 1 = 56$$



$$X = \frac{29,2 \cdot 56}{8,39} = 194,89$$

$$\begin{array}{l} 194,89 - 100\% \\ X - 25\% \end{array}$$

$$X = \frac{194,89 \cdot 25\%}{100\%} = 48,722$$

$$n = \frac{48,72}{56} = 0,87 \text{ моль}$$

$$V = n \cdot V_m$$

$$V = 0,87 \cdot 22,4 = 19,488 \text{ л}$$

$$m: V(\text{KOH}) = 19,488 \text{ л}$$



12.

Берілгені:

$$w(X) = 20,2\%$$

$$m(B) = 52$$

$$m(B \cdot nH_2O) = 9,042$$

шешуі

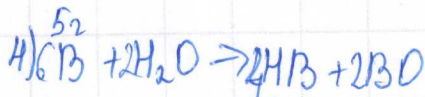


3)  $\frac{m(X)}{m(B)} = 20,2\%$

$$\frac{m(X)}{52} \cdot 100\% = 20,2\% \Rightarrow m(X) \neq 100\% = 5 \cdot 20,2\%$$

$$m(X) \cdot 100\% = 101\%$$

$$m(X) = \frac{101\%}{100\%} = 1,012$$



$$\frac{m(X)}{m(B)} \cdot 100\% = 19,01\%$$

$$\frac{m(C)}{m(D)} \cdot 100\% = 67,61\%$$

13.

Берілгені:

$$m(A) = 0,2912$$

$$V(HCl) = 50 \text{ мл}$$

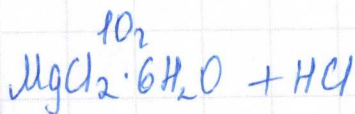
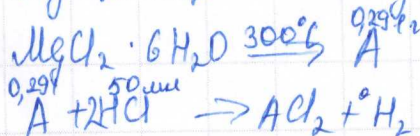
$$n(HCl) = 0,8M$$

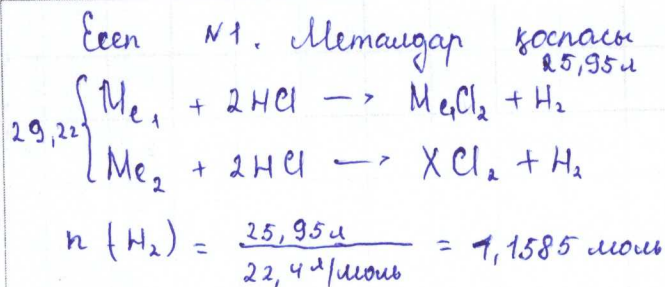
$$V_{\text{регі}} = 100 \text{ мл}$$

$$m(AgCl) = 0,6322$$

$$T/K: w(A) = ?$$

шешуі





$$n(\text{H}_2) = n(\text{Me}_1 + \text{Me}_2) = 1,1585\text{ моль}$$

$$\begin{cases} x + y = 1,1585 \\ 56x + 7y = 29,2 \end{cases}$$

$$\begin{cases} x = 1,1585 - y \\ 56(1,1585 - y) + 7y = 29,2 \end{cases}$$

$$64,88 - 56y + 7y = 29,2$$

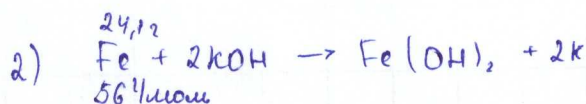
$$64,88 - 49y = 29,2$$

$$-49y = -35,68$$

$$y = 0,728$$

$$n(\text{Me}_2) = n(\text{Fe}) = 0,728$$

Li



$$n(\text{Fe}) = 0,43\text{ моль}$$

$$0,43\text{ моль} - x\text{ моль}$$

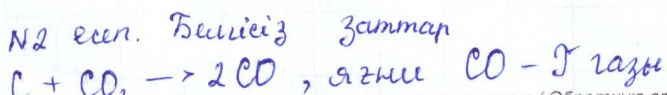
$$1\text{ моль} - 2\text{ моль}$$

$$x = 0,86 \frac{\text{моль}}{\text{моль}} (\text{KOH})$$

$$m(\text{KOH}) = 0,86\text{ моль} \cdot 56\text{г/моль} = 48,16\text{ г}$$

$$48,16 \cdot 0,25 = 12,04\text{ г}$$

$$V = \frac{m}{\rho} = \frac{12,04\text{ г}}{1,185\text{г/мл}} = 10,16\text{ мл}$$



Парақтың артқы жағын толтырмаңыз / Обратную сторону листа не заполнять

Билісіз айналысын еміңіз:

$$n(\text{Me}_1) = x$$

$$n(\text{Me}_2) = y$$

$$M_r(\text{Fe}) = 56\text{ г/моль}$$

$$M_r(\text{Li}) = 7\text{ г/моль}$$

$$x = 1,158 - 0,728$$

$$x = 0,43$$

$$n(\text{Me}_1) = n(\text{Fe}) = 0,43$$

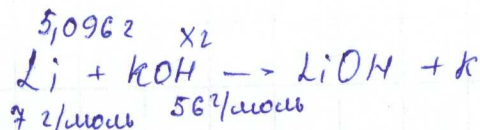
$$0,43 \cdot 56 + 0,728 \cdot 7 = 24,12 +$$

$$+ 5,096 = 29,196$$

$$29,196 \approx 29,22$$

$$m(\text{Fe}) = 24,12$$

$$m(\text{Li}) = 5,0962$$

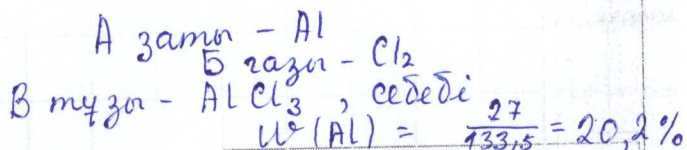


$$n(\text{Li}) = 0,728\text{ моль}$$

$$m(\text{KOH}) = 40,768\text{ г}$$

$$40,768 \cdot 0,25 = 10,192\text{ г}$$

$$V = \frac{m}{\rho} = \frac{10,192\text{ г}}{1,185\text{г/мл}} = 8,6\text{ мл}$$





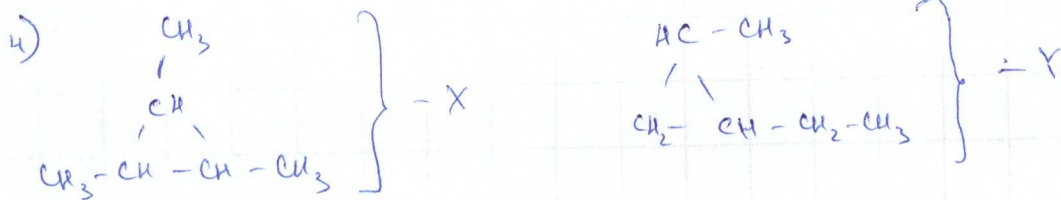
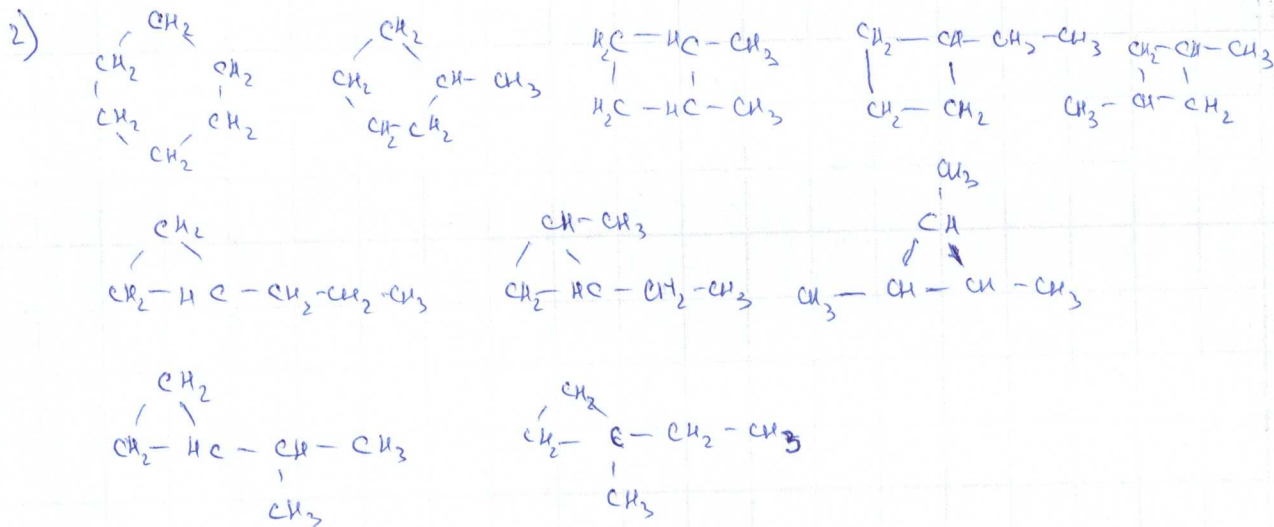
$$nH \Rightarrow P = \frac{M}{V_m} \Rightarrow M = \rho \cdot V_m = 3,45 \text{ г/л} \cdot 22,4 \text{ л/моль} = 77,4 \text{ г/моль} \approx 78$$

Пусть X - циклоалкан  $\Rightarrow C_n H_{2n}$

$$12n + 2n = 84$$

$$14n = 84$$

$$n = 6 \Rightarrow C_6 H_{12}$$



n1 Доко:

$$m_1 (\text{соедин}) = 29,20 \text{ г}$$

$$V(H_2) = 25,95 \text{ л}$$

$$m_{H_2} (\text{исходно}) = 19,44 \text{ г}$$

$$m_2 = 28,43 \text{ г}$$



Решение:

$$\frac{P_1 V_1}{V} = \frac{P_0 T_0}{V_0} \Rightarrow V_0 = \frac{V \cdot P_0 T_0}{P T}$$

$$V_0(H_2) = \frac{25,95 \text{ л} \cdot 101,3 \text{ кПа} \cdot 293 \text{ К}}{101,3 \text{ кПа} \cdot 293 \text{ К}} = 24,18 \text{ л}$$

$$n(H_2) = \frac{24,18 \text{ л}}{22,4 \text{ л/моль}} = 1,08 \text{ моль}$$

Задача 1.

$$n(\text{H}_2) = \frac{25,95}{22,4} \approx 1 \text{ моль}$$

$$m_{\text{мех. смеси}} = 29,20 - 19,44 = 9,76 \text{ г}$$



Задача 1.

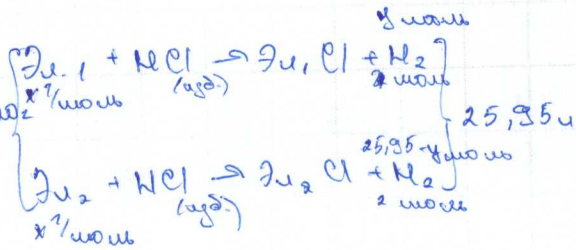
Дано:

$$m(\text{Cu}) = 29,20 \text{ г}$$

$$M(\text{Cu}) = 25,35 \text{ г/моль}$$

$$\Delta m_1(\text{Cu}) = 19,44 \text{ г}$$

$$\Delta m_2(\text{Cu}) = 28,43 \text{ г}$$

 $\text{Cu}_1, \text{Cu}_2 - ?$ 


$$m_1(\text{Cu}) = 29,20 \text{ г} - 19,44 \text{ г} = 9,76 \text{ г}$$

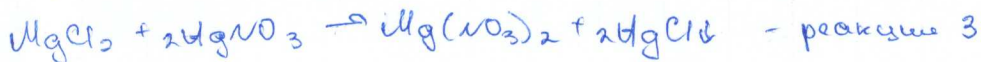
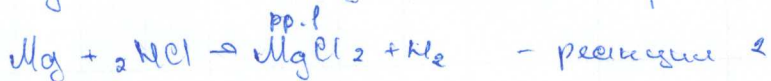
$$m_2(\text{Cu}) = 29,20 \text{ г} + 28,43 \text{ г} = 57,63 \text{ г}$$

Задача 2

B - F<sub>2</sub>

Г - Cu

Задача 3



Задача 4.

$$1) \rho = \frac{m}{V} = \frac{M}{V_m}$$

$$\Rightarrow \text{C}_x\text{H}_y - \text{C}_6\text{H}_{12}$$

$$M(\text{C}_x\text{H}_y) = 3,75 \text{ г/моль} \cdot 22,4 \text{ л/моль} = 84 \text{ г/моль} \Rightarrow$$

Задача 1

$n = \frac{m}{M}$

1)  $m(\text{смеси}) = 29,10\text{г}$   
 $V(\text{H}_2) = 25,95\text{л}$   
 Найти:  $w$ ?

Решение:  $\text{смесь } \text{H}_2\text{SO}_4 \rightarrow \text{H}_2 + \text{H}_2\text{O}$   
 $\Rightarrow 2 \text{ реакция } \text{алекс} + \text{O}_2 = \text{CO}_2 + \text{H}_2\text{O}$

Ответ:  $w = 200\%$

2) Дано:  
 $\rho = 1,185\text{г/мл}$   
 (Найти:  $\text{HCOH}$ )?  
 $m(\text{В}) = 5\text{г}$   
 $w(\text{C}) = 67,61\%$   
 $w(\text{H}) = 19,01\%$

Решение:  $\rho = \frac{m}{V} \Rightarrow V = \frac{1,185}{56} = 54,63\text{мл}$   
 полученная смесь вес

$(\text{кон}) m = n \cdot M = 1,56 \cdot 56$

$\frac{25\% \cdot 56}{100\% - x} = \frac{100 \cdot 56}{1,185}$

Задача 2 (АБВТДеве)

Ответ: возможно рассмотреть растворение иског. смеси.

Дано:  
 $M_r(\text{X}) = 202\%$

Решение:

Найти:  $C_xH_y(A)$ ?  
 $C_xH_y(B)$ ?  
 $C_xH_y(D)$ ?  
 Найти: структурную формулу  $D$ ?  
 формулы  $\text{H}_2\text{O}$  и  $\text{H}_2\text{SO}_4$

1)  $x = \frac{19,01\%}{16} = 1,5 \Rightarrow$  элемент  $x$  это  $\text{O}_2$

$C_xH_yO_z$ ?

$D =$  возможная формула  $\text{C}_2\text{H}_2\text{O}_2$ ?  
 $A =$  бинарное соединение возможно  
 $B =$   $\text{NH}_3$  возможной элемент азот  
 $B = \text{H}_2\text{SO}_4$  (возможной реагент)

$\Gamma = (\text{NO}_2)$  - возможно либо  $(\text{Cl}_2)$   
 $\text{NH}_3$  (аммиак)  $\Gamma =$   
 гидроксидов  $\text{H}_2\text{O}$   
 возможен неорганический  $\text{SO}_2$ .

Задача 3

Дано:  $m(A) = 0,29\text{г}$

$V(\text{HCl}) = 50\text{мл}$  (т.е.  $1\text{г} = 1000\text{мл}$   $0,05\text{л}$ )

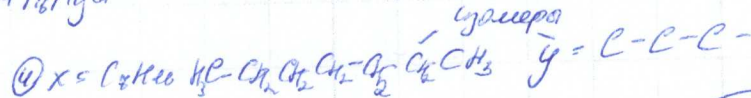
Найти:  $w(\text{C})$ ?  
 $C_xH_y(A)$ ?  
 $\text{PH}(\text{Pset})$ ?

2)  $w(\text{Fe}) = \frac{m(\text{вещ.})}{m(\text{р-ра})} \cdot 100\%$

Решение:

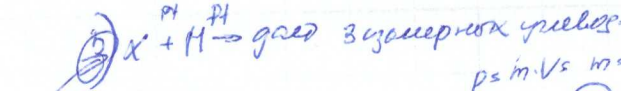
1)  $w = \frac{m(\text{вещ.})}{m(\text{р-ра})} = w$   
 формула  $\text{MgCl}_2 \Rightarrow 35,5 + 2 \cdot 35,5 = 106,5$   
 $w = \frac{m(\text{вещ.})}{m(\text{р-ра})} \cdot 100\% = w = \frac{0,29}{58,5 \cdot 45,5} \cdot 100\%$   
 $29\%$  формула  $\text{MgCl}_2$

3) 1 реакция:  $\text{Al} + \text{H}_2\text{SO}_4$   
 2 реакция:  
 3 реакция:  
 4 реакция:



Задача 4

Дано:  
 $\rho(\text{газ}) = 3,75\text{г/л}$   
 не обесцвет.  $\text{KMnO}_4$   
 Найти:  $C_xH_y(x)$ ?



Решение:  
 $\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V = 3,75 \cdot 22,4 = 84$   
 формула  $\text{C}_3\text{H}_6$   
 элемент  $\text{H, C, O}$   
 $\text{C}_3\text{H}_6$   $\text{C}_3\text{H}_4$   $\text{C}_3\text{H}_2$   $\text{C}_3\text{H}_8$   $\text{C}_3\text{H}_{10}$   $\text{C}_3\text{H}_{12}$