

Задача 15

Дано:

$$m(\text{Al} + \text{Mg}) = 23,8 \text{ г}$$

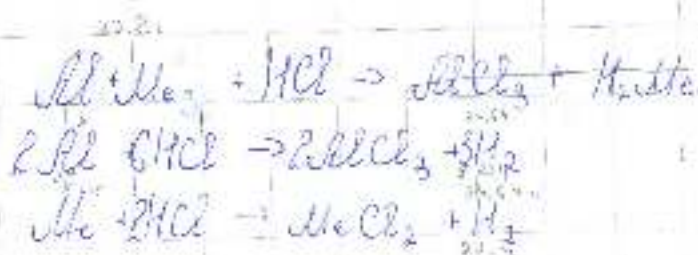
$$V(\text{H}_2) = 24,64 \text{ л (н.у.)}$$

$$\text{Mg} \text{ в } 1,25 \text{ раз} > \text{Al}$$

Найти:

Mg-?,  $\omega(\text{Mg})$ ?

Решение:



$$\frac{x}{27} = \frac{24,64}{3 \cdot 22,4}$$

$$x = \frac{54 \cdot 24,64}{734,4}$$

$$x = 9,9$$

$$x \cdot 1,25 = 9,9 \cdot 1,25 = 12,4$$

$$\frac{12,4}{x} = \frac{24,64}{22,4}$$

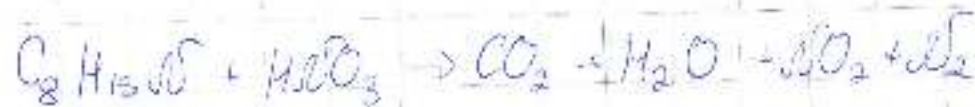
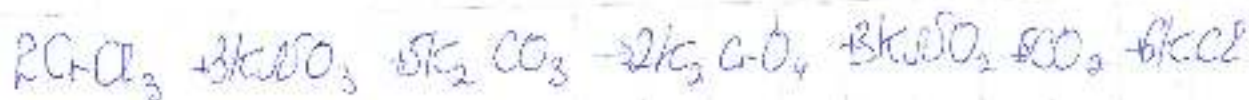
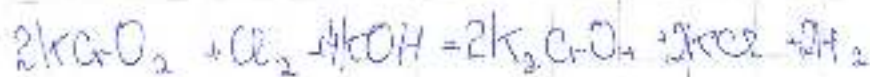
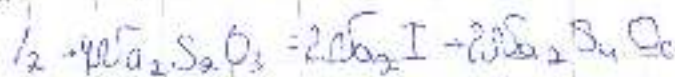
$$x = \frac{12,4 \cdot 22,4}{24,64}$$

$$x = 11,3$$

$$\omega = \frac{11,3}{23,8}$$

$$\omega = 50\%$$

Возьмем растворение исходной навески



Задача 4

Дано:

$$m(\text{H}_2\text{O}) = 200 \text{ г}$$

$$t = -80^\circ$$

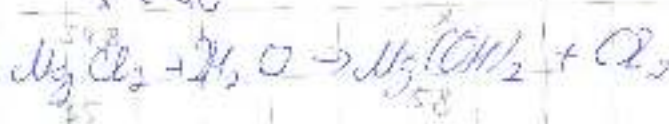
Решение:



$$\frac{65,8}{95} = \frac{x}{58}$$

$$x = \frac{65,8 \cdot 58}{95}$$

$$x \approx 40$$



$$\frac{54,8}{95} = \frac{x}{58}$$

$$x = \frac{54,8 \cdot 58}{95}$$

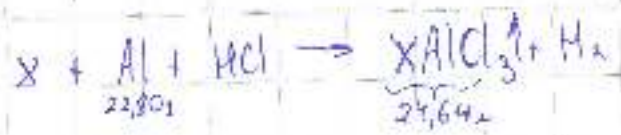
$$x \approx 33,5$$





N1.

1)  $m(Al) = 22,80g$



$m(x \cdot n(Al)) = ?$

$24,64 - 22,80 = 1,84$

$x = Na$

$1,84 : 1,25 \approx 22g$

2).

N2.

1)  $x = Ag$

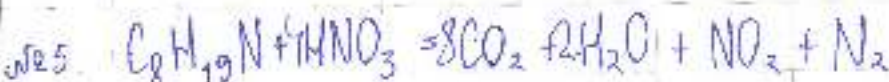
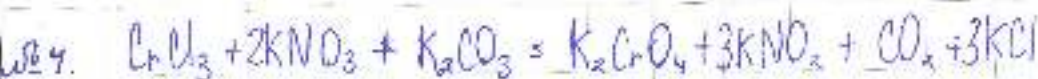
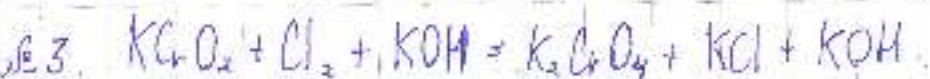
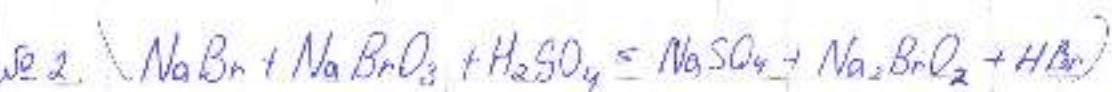
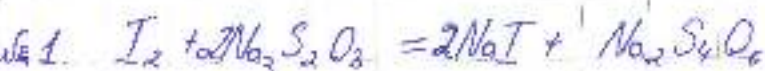
$A = AgSO_3$

2).

3).

4)  $20 \cdot 1,25 = 18 \cdot 22,2 = 35,52 + 1916 \approx 1951g$

№3.



№4.

ЗАДАЧА №3

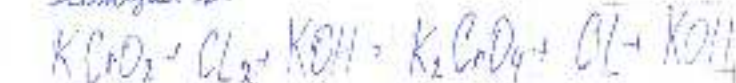
Реакция №1



Реакция №2



Реакция №3





1) Дано.  
 $m(\text{Cl}_2, \text{металл}) = 22,8 \text{ г}$   
 $V(\text{H}_2) = 24,64 \text{ л}$   
 $175 \text{ г? металл} = m(\text{Cl}_2)$

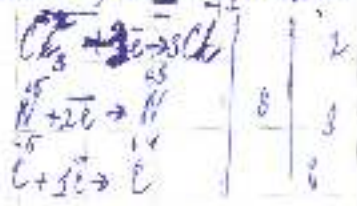
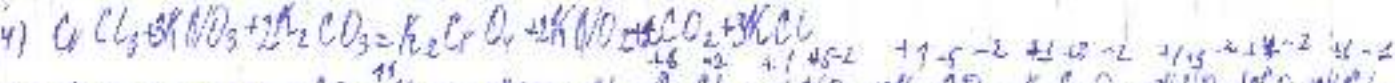
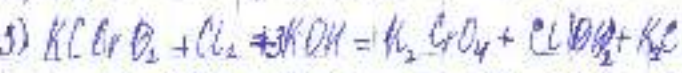
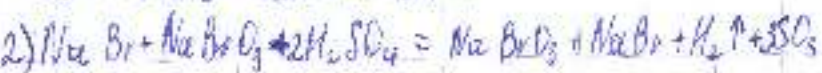
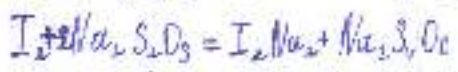
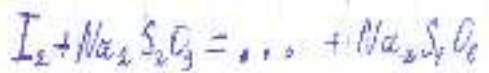
Решение.  
 $2\text{Al} + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3 + 3\text{H}_2 \uparrow$   $n(\text{Al}) : n(\text{H}_2) = 2 : 3 = 1 : 1,5$   
 $\text{металл} + \text{Cl}_2 \rightarrow \text{металл} \text{Cl}_2 + \text{H}_2 \uparrow$   $n(\text{мет}) : n(\text{H}_2) = 1 : 1$   
 ~~$x + y =$~~  Пусть  $x$  - кол-во вещества алюминия  
 $m(\text{Al}) = 27x$ , тогда  $m(\text{H}_2) = 40,5x$ ;  $\rho(\text{мет}) = 175 \text{ г/л}$   
 Пусть  $y$  - количество вещества неизвестного металла.  
 $m(\text{мет}) = n(\text{H}_2) = \frac{V}{V_m} = \frac{24,64}{22,4} = 1,1$   $x + n(\text{H}_2) = 1,1$   $x = 1,1 - n(\text{H}_2) = 1,1 - 1,5x$   
 $27x + 175x = 22,8$   
 ~~$x = 0,12$~~   $2,5x = 1,1$   $x = 0,44 \text{ (Al) - д.б.}$   $n(\text{Al}) = 1,5 \cdot 0,44 = 0,66 \text{ моль}$   
 $m(\text{Al}) = 0,44 \cdot 27 = 11,88$   $m(\text{H}_2) = 22,8 - 11,88 = 10,92$   $M = \frac{m}{n}$   
 $\omega(\text{H}_2) = 10,92 = 22,8 \cdot 100\% \approx 48\%$   $M(\text{мет}) = \frac{10,92}{0,66} = 16,54$

2.1 Дано.  
 $\omega(\text{S}) = 86,62\%$   
 $x$  - ?  
 суммару А - ?

Решение.  
 $\text{X} + \text{H}_2\text{S} \rightarrow \text{AS} + \text{H}_2 \uparrow$   
 $m(\text{S}) = n \cdot M$   
 $m(\text{S}) = 1 \cdot 32 = 32 \text{ г}$   
 $\omega = \frac{m_{\text{вещ}}}{m_{\text{вещ.}}} = \frac{32}{m_{\text{вещ.}}}$   $m_{\text{вещ.}} = \frac{32}{86\%} = 37 \text{ г}$   
 Ответ:  $\omega = 48\%$ , металл - NE

3 задание

Данная № 2



Дано:  
M(MO) = 100g

Решение:  
м(кисл. газ)



№1

Берілгені:

$$V(\text{CO}_2) = 24,64 \text{ л}$$

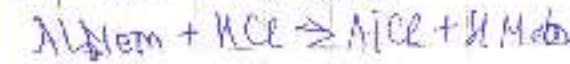
$$m(\text{Al, Mem}) = 22,802$$

$$M_{\text{Mem}} = \text{Al} \cdot 2,25$$

Шешуі:



$$n = \frac{V}{V_m} = \frac{24,64 \text{ л}}{22,4 \text{ л/моль}} = 1,1 \text{ моль } \text{CO}_2$$



$$m = 44 \text{ г/моль} \cdot 1,1 \text{ моль} = 48,4 \text{ г}$$

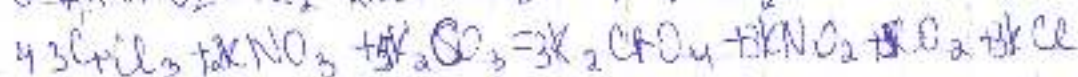
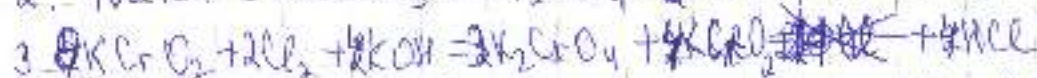
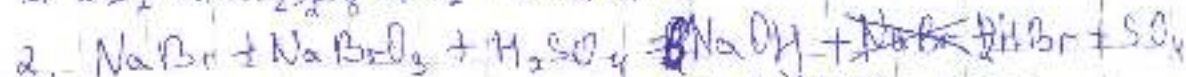
№2

Берілгені:

96,62%

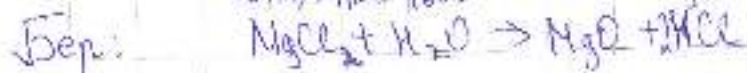


13



14.

65.51/04.21.1002



1) Берлингейт:

Удельн:

$m(\text{кисл.}) = 22,60\text{г}$

$22,8 = 10,135 + 12,66825$

$\text{HCl}$

$m(\text{Al}) = 10,135 \quad m(\text{O}) = 12,66825$

$V(\text{H}_2\text{O}) = 24,44\text{л}$

$n(\text{H}_2\text{O}) = \frac{10,135}{17}$

$n(?) \xrightarrow{125} n(\text{H}_2\text{O})$

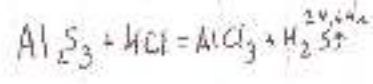
$n(\text{Al}) = 0,379\text{моль}$

$w(?) = ?$

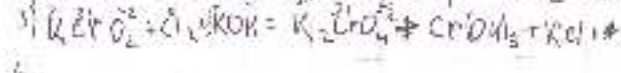
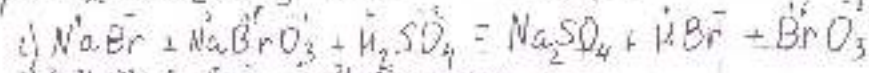
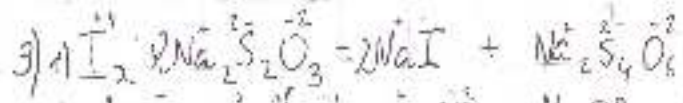
$0,379 \cdot \frac{12,66825}{x} \approx 32, \quad m(\text{H}_2\text{O}) = 5$

$w = \frac{m(\text{H}_2\text{O})}{m(\text{кисл.})} \cdot 100\% = \frac{12,66825}{22,8} = 0,555 \cdot 100\% = 55,5\%$

$w(\text{Al}) = 55,5\%$

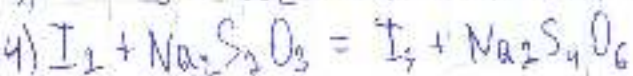
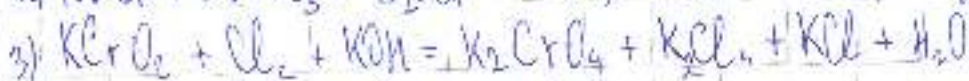
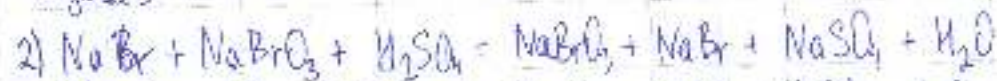


2)





Задача 3



Задача 1

$$24.64 - 100 \quad \left| \quad y = \frac{24.64 \cdot 100}{1.25} = 1971.2\% \right.$$

$$y = 1.25$$

$$1.25$$

$$\frac{24.64 - 100}{1.25}$$

$$w = 1971.2$$

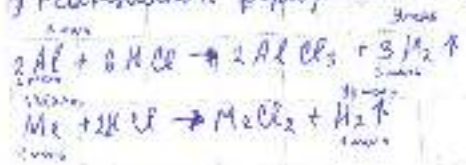
М.

$m(\text{KOH}) = 22,8 \text{ г}$

$V(\text{H}_2) = 22,4 \text{ л}$

$n(\text{H}_2) = n(\text{Al}) = 1,25$

1) Реакциялық формуласын жазайық:



2) екі реакциядан да суық газдың мольдік теңдестігі:

$n(\text{H}_2) = \frac{2x}{2} = 1,5 \times (\text{моль})$

$n_2(\text{H}_2) = 1,25 \times 2 = 2,5 \times (\text{моль})$

3) Енді алардың мольдік теңдестігі:

$V_1(\text{H}_2) = n_1(\text{H}_2) \cdot V_n = 1,5 \times 22,4 = 33,6 \text{ л}$

$V_2(\text{H}_2) = n_2(\text{H}_2) \cdot V_n = 2,5 \times 22,4 = 56 \text{ л}$

4) теңдеу құрастырамыз

$22,8x + 28x = 22,4$

$50,8x = 22,4$

$x = \frac{22,4}{50,8} = 0,4 \text{ (моль)}$  (Al мольдері)

5) Белгіз Mg мольдерін табады:

$m(\text{Mg}) = n(\text{Al}) \cdot (23 \cdot 2 + 4) = 1,25 = 0,5 \text{ (моль)}$

6) Белгіз Mg массасы:

$m(\text{Mg}) = 0,5 \cdot m(\text{Al}) \quad m(\text{Al}) = 0,4 \cdot 27 = 10,8 \text{ (г)}$

$m(\text{Al}) = n(\text{Al}) \cdot M_r(\text{Al}) \quad m(\text{Mg}) = 22,8 - 10,8 = 12 \text{ (г)}$

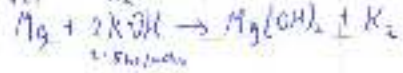
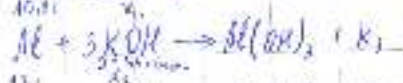
7) Белгіз Mg мольдік теңдестігі:

$M_r(\text{Mg}) = \frac{m(\text{Mg})}{n(\text{Mg})} \quad A_r(\text{Mg}) = \frac{12}{0,5} = 24 \text{ г/моль} \quad w(\text{Mg}) = \frac{m(\text{Mg})}{m(\text{созм})} \cdot 100\% =$

Сонда, белгіз Mg = Mg.

$w(\text{Mg}) = \frac{12}{22,8} \cdot 100\% = 52,63\%$

2) Реакция реакция теңдестігі:



3) Реакциядан да KOH массасы:

$m(\text{KOH}) = \frac{48 \cdot 3 \cdot 56}{27} = 57,2 \text{ (г)}$

$m_2(\text{KOH}) = \frac{72 \cdot 2 \cdot 56}{24} = 56 \text{ (г)}$

4) KOH ер-і массасы:

$m_{\text{созм}}(\text{KOH}) = m_1(\text{KOH}) + m_2(\text{KOH})$

$m_{\text{созм}}(\text{KOH}) = 57,2 + 56 = 113,2 \text{ (г)}$

$m_{\text{ер}}(\text{KOH}) = \frac{m(\text{KOH})}{w(\text{KOH})} \cdot 100\%$

$m_{\text{ер}}(\text{KOH}) = \frac{113,2}{0,52} \cdot 100\% = 47,865 \text{ л}$

4) KOH ер-і көлемі:

$V(\text{KOH}) = \frac{m(\text{KOH})}{\rho(\text{KOH})}$

$V_{\text{ер}}(\text{KOH}) = \frac{113,2}{1,15} = 47,865 \text{ л}$

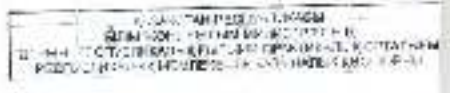
Al X метал - Ba, литий, В зерттегенде зерт. дәрішпен те, андаси югити деп.

еу фот гурда бадагт ине к зоринса ол метт елсін елсепте, X - Ba, ал ~~...~~

B - BaSO<sub>4</sub> (тоғ метт түніс)

Сонда A - BaSi (пара метт түніс)

Суреті болжама келтіру рәкшесі:





$C(BaSO_4 \text{ р-ра})$ :

$m(H_2O) \leq 100 \text{ г}$  для раствора;

$\rho(BaSO_4 \text{ р-ра}) = 1 \text{ г/мл} = 1000 \text{ г/л}$

$\rho(BaSO_4) = \frac{m(BaSO_4)}{V(BaSO_4)}$

$m(BaSO_4 \text{ р-ра}) = m(H_2O) + m(BaSO_4)$

$100 \text{ г} = 0,0032 \text{ г} + BaSO_4$

$n(BaSO_4) = \frac{0,0032}{233} = 0,0000137 \text{ (моль)}$

$m(BaSO_4 \text{ м.г.}) = 100 + 0,0032 = 100,0032 \text{ г}$

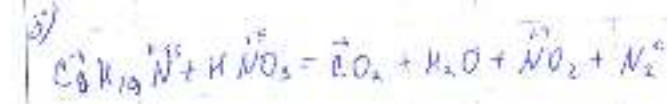
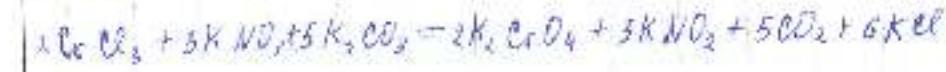
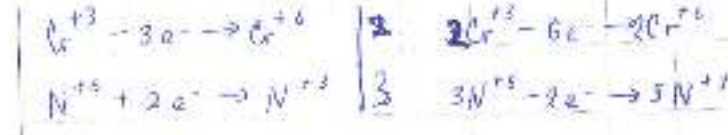
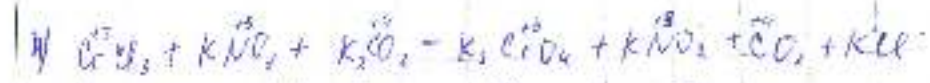
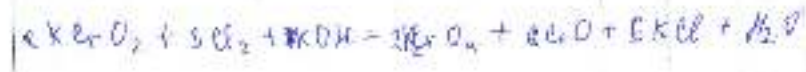
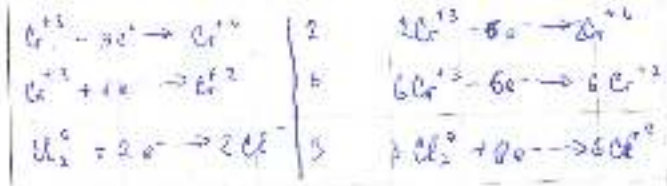
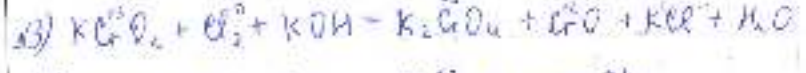
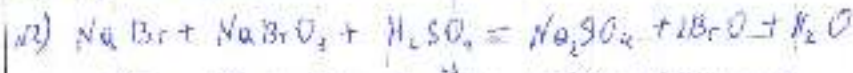
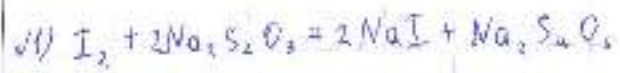
$V(BaSO_4 \text{ р-ра}) = \frac{m(BaSO_4 \text{ р-ра})}{\rho(BaSO_4 \text{ р-ра})}$

$C(BaSO_4) = \frac{n(BaSO_4)}{V(BaSO_4)}$

$V(BaSO_4 \text{ р-ра}) = \frac{100,0032}{1000} \approx 0,1 \text{ л}$

$C(BaSO_4) = \frac{0,0000137}{0,1} = 0,000137 \text{ моль/л}$

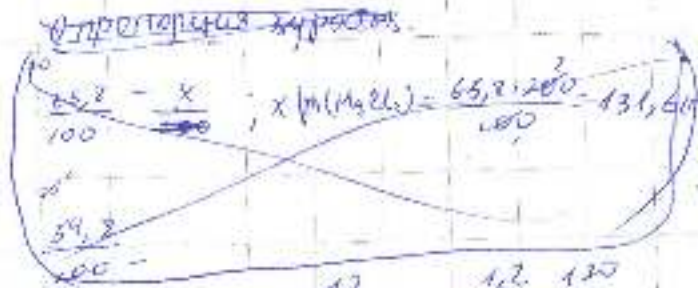
N3



$N^{+5}$



№4.  
 $P_{100}^{100}(MgCl_2) = 65,8\%$   
 $P_{100}^{200}(MgCl_2) = 54,8\%$   
 $m(\text{қарапайым зат}) = ?$   
 $m(MgCl_2 \text{ з-е}) = 200\%$



$$m(H_2O) + m(MgCl_2) = 200x$$

$$200(85,8) = 200x$$

$$x = \frac{165,8}{200} = 0,829$$

$$m(H_2O) = m_1(H_2O) \cdot \frac{1,2}{100} = 100 \cdot \frac{1,2}{100} = 1,2$$

$$m(MgCl_2) = m_1(MgCl_2) \cdot \frac{1,2}{100} = 65,8 \cdot \frac{1,2}{100} = 0,7896$$

процент

$$\frac{x}{100} = \frac{54,8}{100} \quad x = \frac{120 \cdot 54,8}{100} = 65,76$$

$$m(\psi) = m_1(MgCl_2) - m_2(MgCl_2)$$

$$m(\psi) = 10 - 65,76 = 14,24$$

1)  $m(\text{HCl}) = 22,8 \text{ г}$   
 $V(\text{HCl}) = 24,6 \text{ мл}$   
 $V(\text{H}_2\text{O}) = 29,4 \text{ мл}$   
 $\rho(\text{HCl}) = 1,25 \text{ г/мл}$   
 $\rho(\text{H}_2\text{O}) = ?$   
 $M(\text{HCl}) = 36,5 \text{ г/моль}$   
 $n(\text{HCl}) = ?$

Решение  
 $\text{HCl} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+ + \text{Cl}^-$   
 $m = \rho \cdot V$   
 $\rho(\text{H}_2\text{O}) = \frac{29,4 \cdot 1 \text{ г}}{29,4 \text{ мл}} = 1,0 \text{ г/мл}$   
 $\rho(\text{HCl}) = \frac{m}{V} = \frac{22,8 \text{ г}}{24,6 \text{ мл}} = 0,927 \text{ г/мл}$   
 $n(\text{HCl}) = \frac{m}{M} = \frac{22,8 \text{ г}}{36,5 \text{ г/моль}} = 0,625 \text{ моль}$

2)  $\text{HCl} + \text{KOH} \rightarrow \text{KCl} + \text{H}_2\text{O}$   
 $V(\text{HCl}) = 22,4$   
 $\rho = 1,25 \text{ г/мл}$   
 $m(\text{HCl}) = 1,25 \cdot 22,4 = 28 \text{ г}$   
 $V(\text{H}_2\text{O}) = ?$

Решение  
 $\text{HCl} + \text{KOH} \rightarrow \text{KCl} + \text{H}_2\text{O}$   
 $\rho = \frac{m}{V} \quad V = \frac{m}{\rho}$   
 $V(\text{H}_2\text{O}) = ?$   
 $m(\text{H}_2\text{O}) = 1,0 \text{ г/мл} \cdot V(\text{H}_2\text{O})$   
 $\rho(\text{H}_2\text{O}) = 1,0 \text{ г/мл}$   
 $V(\text{H}_2\text{O}) = 66,36 \text{ мл}$

3)  $V(\text{H}_2\text{O}) = 10,6 \text{ мл}$

$V(\text{H}_2\text{O}) = 0,25 \cdot 66,36 \text{ мл} = 16,6 \text{ мл}$

- 1)  $\text{Fe} + \text{Na}_2\text{SO}_4 \rightarrow \dots + \text{Na}_2\text{S}_4\text{O}_6$
- 2)  $\text{Na}_2\text{P}_2\text{O}_7 + \text{Na}_2\text{P}_2\text{O}_7 + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{P}_2\text{O}_7 + \text{O}_2 \uparrow$
- 3)  $\text{KClO}_3 + \text{Cl}_2 + 2\text{KOH} \rightarrow \text{K}_2\text{CO}_3 + 2\text{KCl} + \text{HCl}$  и т.д.
- 4)  $\text{CaCl}_2 + \text{KNO}_3 \rightarrow 3\text{K}_2\text{CO}_3 \rightarrow \text{K}_2\text{CO}_3 + \text{KNO}_3 + 2\text{CO}_2 + 2\text{KCl}$
- 5)  $\text{C}_3\text{H}_{10}\text{N}_4 + 4\text{HNO}_3 \rightarrow 8\text{CO}_2 + 10\text{H}_2\text{O} + 4\text{N}_2 + \text{N}_2$

Решение  
 1)  $\text{Fe} + \text{Na}_2\text{SO}_4 \rightarrow \dots + \text{Na}_2\text{S}_4\text{O}_6$



№1  
 Дано:  
 $m(\text{CuCl}_2) = 200 \text{ г}$   
 $T_1 = 80^\circ$   
 $T_2 = 20^\circ$   
 $m(\text{Cu}) = 200 \text{ г}$  (осадок)  
 $m(\text{CuCl}_2) = ?$   
 Найти количество

Решение  
 $\text{CuCl}_2 + \text{H}_2\text{O} \rightarrow \text{Cu} + \text{Cl}_2 \rightarrow \text{CuCl}_2 + \text{H}_2\text{O}$   
 $m(\text{Cu}) = m(\text{CuCl}_2) = 200 - 65,8 = 134,2 \text{ г}$   
 $\Delta T = -40^\circ \text{C}$   
 (примесей)

$v(\text{CuCl}_2) = \frac{m}{M}$   
 $v(\text{CuCl}_2) = \frac{134,2 \text{ г}}{134,5} \approx 1,0 \text{ моль}$

$v(\text{CuCl}_2) = 2,25 \text{ моль}$   
 $m(\text{CuCl}_2) = 2,25 \cdot 134,5 = 302,6 \text{ г}$

$m(\text{CuCl}_2) = 2,25 \cdot 58 \text{ г/моль} = 130,5 \text{ г}$   
 Ответ:  $m(\text{CuCl}_2) = 130,5 \text{ г}$

№2  
 $X + \text{H}_2\text{S} \rightarrow Y + \text{H}_2 \uparrow$   
 $w(Y) = 89,65\%$   
 $X = 100\% - 89,65\% = 10,35\%$   
 $Y = \text{K}_2\text{S}$   
 Предположим: K  
 $2\text{K} + \text{H}_2\text{S} \rightarrow \text{K}_2\text{S} + \text{H}_2 \uparrow$

Дано:  
 $w(\text{K}_2\text{S}) = 89,65\%$   
 $\text{K} = \text{K}$

Решение  
 $2\text{K} + \text{H}_2\text{S} \rightarrow \text{K}_2\text{S} + \text{H}_2 \uparrow$   
 $m = 10,35\% \cdot 0,12 = 0,01242 \text{ моль}$   
 $\frac{1}{2} \cdot 0,01242 = 0,00621 \text{ моль}$

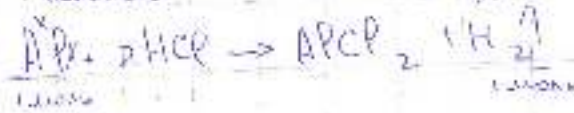
$w = \frac{m(\text{Cu})}{m(\text{CuCl}_2)} = 100\%$



Задача 1

Дано:  
 металл неизвестен  
 m(сильс) 22,80 г  
 V(H<sub>2</sub>) - 24,64 л  
 m(H<sub>2</sub>O) - ?  
 m(неизв. металл) - ?  
 ρ(металл) - ?

Решение



$n(\text{H}_2) = \frac{24,64}{22,4} = 1,1 \text{ моль}$

$x = \frac{1,1 \cdot 1}{1} = 1,1 \text{ моль (H HCl)}$

пусть x - m ZP, тогда 1,25x m(неизвестного металла)

$1,25x + x = 22,80$   
 $1,25(22,8 - 1,25x) + 22,8 - 1,25x = 22,8$   
 $x = 22,8 - 1,25x$   
 $2,5x - 1,5625x = 22,8 - 1,25x$   
 $-1,5625x - 1,25x = 22,8 - 22,8$   
 $-2,8125x = -28,5$

$x = 10,135135 \text{ m(HCl)}$

m(неизвестного металла) =  $10,135135 \cdot 1,25 = 12,66791875 \approx 12,7 \text{ г}$

M(неизвестного металла) =  $27 : 1,1 = 24,54 \text{ - C}$

$22,8 \rightarrow 100\%$

$12,7 \rightarrow x$

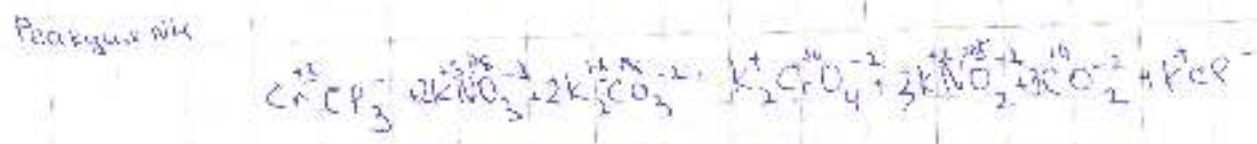
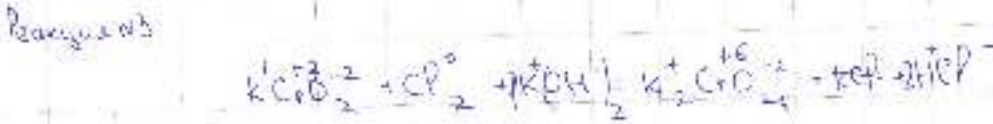
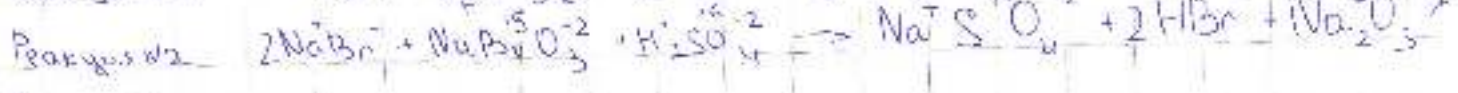
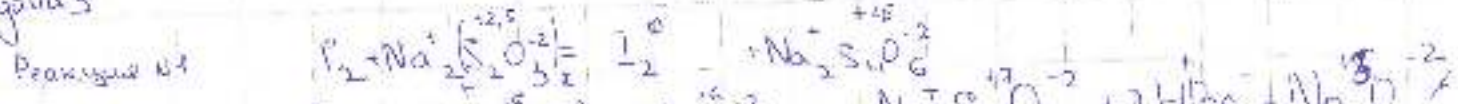
$x = \frac{12,7 \cdot 100}{22,8} = 55,67\% \text{ p(C)}$

Отв. п.с - 55,67%

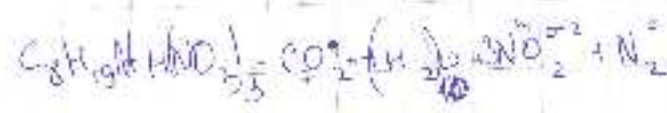
Задача 2

Дано:  
 - Дано  
 ρ(x) 66,2%

Задача 3



Реакция 5



Задача 4

Дано:  
Вопрос

Решение

$m(MgCl_2 \cdot 6H_2O) = 200g$

$t_1 = 30^\circ$

$t_2 = 20^\circ$

Реш.  $(MgCl_2) = 65,8 \cdot 2 = 131,6g$

$m(H_2O) = 0,297g$

$V(H_2CO_3) = 50cm^3$

$C_m(H_2CO_3) = 0,1M$

$V_2 = 100cm^3$

$m(соед.) = 0,632g$

$V_p \text{ р-ра } (NaOH) = 12cm^3$

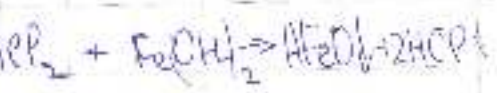
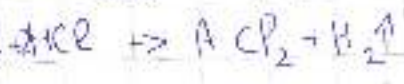
$C_m(0,05M)$

при  $30^\circ C = 65,8 \cdot 2 = 131,6g$

при  $20^\circ C = 65,8 \cdot 2 = 109,6g$

$MgCl_2 = A$

$n = \frac{V \cdot C_m}{cm} = \frac{50}{0,1} = 500cm^3$



$m(CP) = 131,6g$

$0,297g \rightarrow 100^\circ$

Есеп - 1

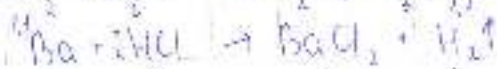
Берілгені:

$$m(\text{Al} + \text{Ba}) = 22,30 \text{ г}$$

$$V(\text{H}_2) = 14,54 \text{ л}$$

$$w(\text{Ba}) = ?$$

Шешуі:



$$1) n(\text{H}_2) = \frac{V}{V_m} = \frac{14,54}{22,4} = 0,65 \text{ моль}$$

$$m(\text{Ba}) = n \cdot M = 0,65 \cdot 137 = 89,075 \text{ г}$$

$$22,30 \text{ г} (\text{Al} + \text{Ba}) = 100\%$$

$$89,075 \text{ г} (\text{Ba}) = x\%$$

$$w(\text{Ba}) = \frac{89,075}{22,30} \cdot 100\% = 399,44\%$$



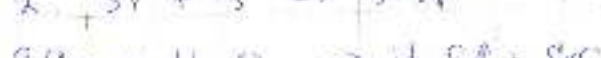
$$V = 0,65 \cdot 22,4 = 14,56 \text{ л}$$

$$m(\text{Al(OH)}_3) = 0,65 \cdot 78 = 50,7 \text{ г}$$

Есеп - 2

$$X = ? ; A = ? ; B = ?$$

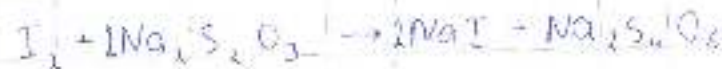
$$K - \text{Ba} ; A - \text{Li} ; B - \text{Sr}$$



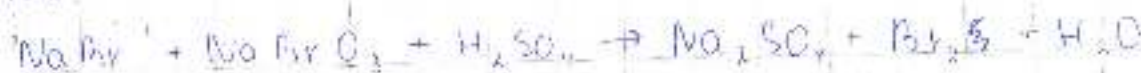


Есеп - 3

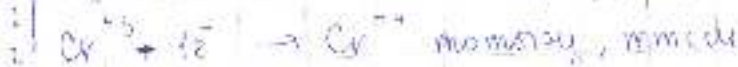
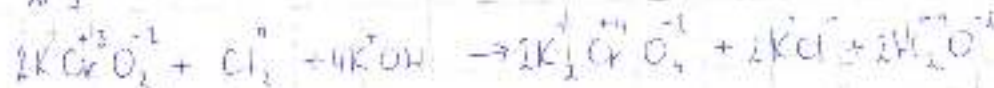
№1



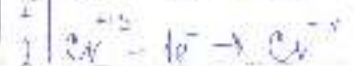
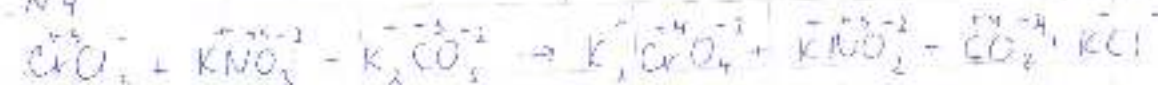
№2



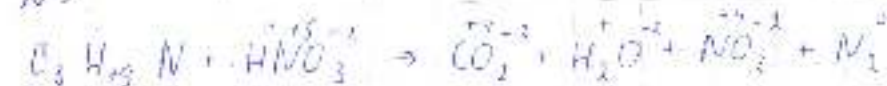
№3



№4



№5



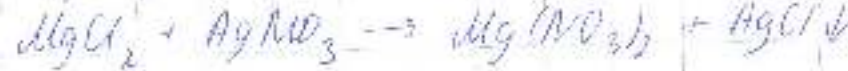
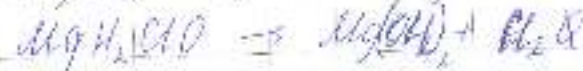
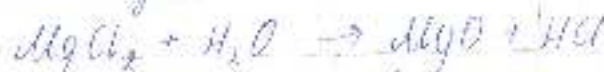
Есеп - 4

1. берілетін:

Мемия:

А заттар - Mg

$$m(MgCl_2) = 100g$$



$$T_1 = 20^\circ C$$

$$T_2 = 10^\circ C$$

1 задание

1) Найти металл - Si

4)  $M - 28,0855 = 28$

2)  $O$  камен. = 0,29

$O = 25\% \cdot 1,15 \text{ ч.м.в.} = 0,2875$

2 задание

1) Найти металл

3)  $M = 86,62\%$

3)

$M - 86,62\%$

$n = 7$

$x = ?$

3 задание

1)  $I_2 + Na_2S + Na_2CO_3 +$

2)  $NaBr + NaBrO_3 + Na_2SO_4 + H_2SO_4 = Na_2SO_4 + H_2O$

3)  $K_2Cr_2O_7 + CrCl_3 + KOH = K_2CrO_4 + KCl + H_2O$

4)  $CaCl_2 + KNO_3 + K_2CO_3 = CaCO_3 + KNO_2 + CO_2 + KCl$

5)  $Ca + HNO_3 = Ca(NO_3)_2 + H_2$

4 задание

$170 - 0,5 \cdot 2 \cdot 54,22 = 162,3$

100)

2)  $M =$

1 - өсөн

Берилгени:

$m(\text{H}_2\text{SO}_4) = 22,80\%$

$V(\text{H}_2\text{O}) = 21,6\%$

$m/k: 2, \omega - ?$

2)  $V - ?$

Менгүү:

$x_1$

$22,80\%$

$29,84\%$



$n$       багыш      ээлеш      ээлеш

$M$        $35,5 \cdot 2 \text{ г/моль}$        $135,87 \text{ г/моль}$        $2,016 \text{ г/моль}$

$m$        $213,2$        $271,2$        $62,2 \text{ г}$

$x_2 = 22,80\%$

$213,2 = 271,2$

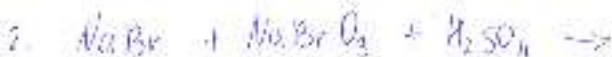
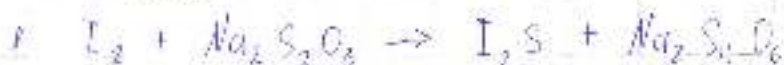
$x = \frac{213,2 - 22,80\%}{271,2} = 17,9 \text{ г (HCl)}$

$m_{\text{спиритинги}} = m_{\text{спиритинги}} + m_{\text{спиритинги}} = 22,80\% + 17,92 = 40,72$

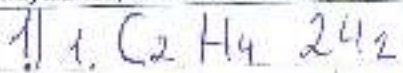
$\omega(\text{H}_2) = \frac{m_{\text{спиритинги}}}{m_{\text{спиритинги}}} \cdot 100\% = \frac{22,80\%}{40,72} \cdot 100\% = 56,01\%$

2 - өсөн

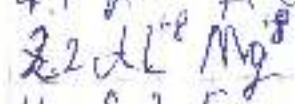
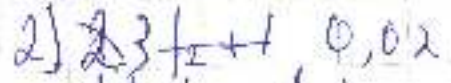
3 - өсөн



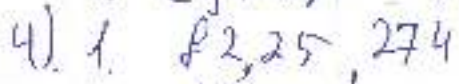
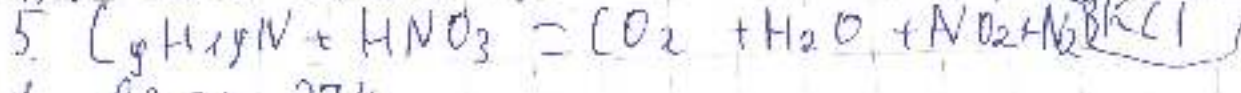
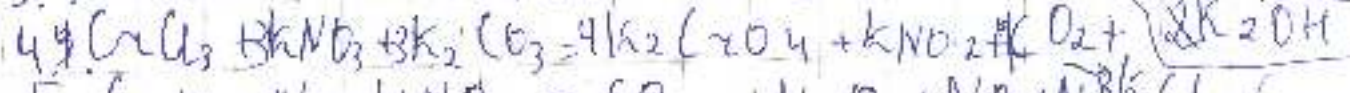
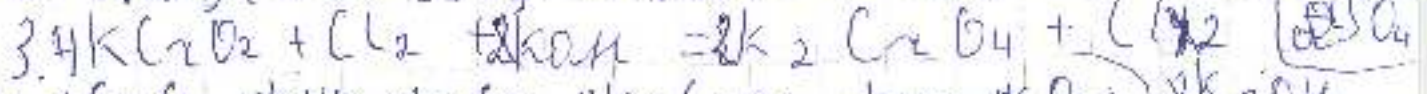
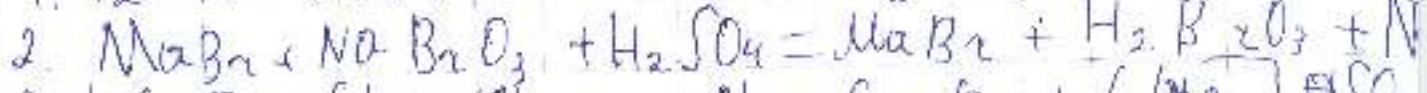
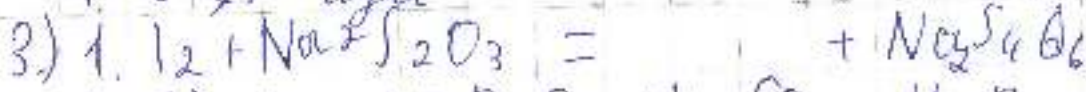




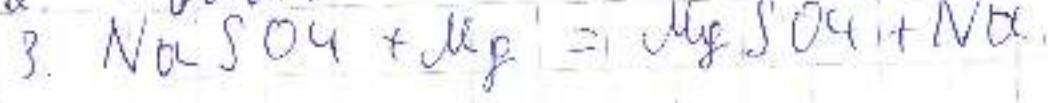
2.  $CaSO_4$



4. 6, 5, 2000

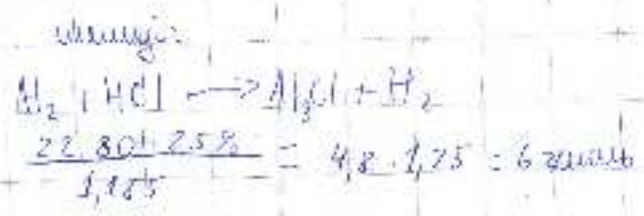


2. 150 ml



10

N2. Бериллий  
 $m_x = 22,80 \text{ г}$   
 $V(\text{газ}) = 21,44 \text{ л (н.у.)}$   
 $m(\text{гидрог.}) = ?$

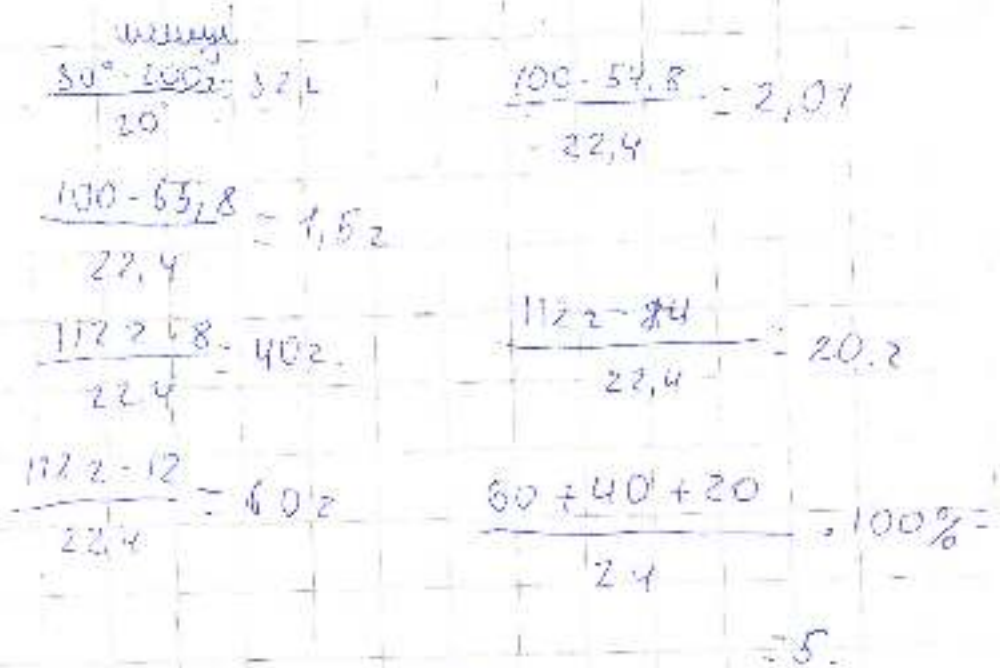


ответ:  $m(\text{гидрог.}) = 6 \text{ грамм}$

N3.

1.  $\text{I}_2 + \text{Na}_2\text{S}_2\text{O}_3 = \text{I}_2 + \text{Na}_2\text{S}_4\text{O}_6$
2.  $\text{Na}_2\text{Br} + \text{NaBrO}_3 + \text{H}_2\text{SO}_4 = \text{Na}_2\text{Br}_2\text{O}_2 + \text{Na}_2\text{Br}_2\text{O}_3 + \text{H}_2\text{O}$
3.  $\text{KCrO}_2 + \text{Cl}_2 + \text{KOH} = \text{K}_2\text{CrO}_4 + \text{KCl} + \text{H}_2\text{O}$
4.  $\text{CrCl}_3 + \text{KNO}_3 + \text{K}_2\text{CO}_3 = \text{K}_2\text{CrO}_4 + \text{KMnO}_2 + \text{CO}_2 + \text{KCl}$
5.  $\text{C}_3\text{H}_7\text{N}$  - негетероциклическая органическая азотная (диазопротиметил-амин).  
 $\text{C}_3\text{H}_7\text{N} + \text{HNO}_3 = \text{CO}_2 + \text{H}_2\text{O} + \text{NO}_2 + \text{N}_2$

N4.  
 $m_x = 242$   
 $m_1 = 82$   
 $m_2 = 42$   
 $m_3 = 112$   
 $\text{MgCl} = \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$   
 $m(\text{Cl}) = ?$



ответ:  $m(\text{Cl}) = 52$



N2

Берілгені:

$$m_x = 18,2$$

$$m_1 = 4,2$$

$$m_2 = 4,2$$

$$m_3 = 0,2$$

$$m_4 = 4,2$$

$$m(A) = 86,62\%$$

$\gamma = 6$

$$m(B) = ?$$

Шыңғы:

$$m_1 = \frac{4,2 \cdot 86,62\%}{22,4} = 3,5$$

$$m_2 = \frac{4,2 \cdot 86,62\%}{22,4} = 3,5$$

$$m_3 = \frac{6 \cdot 86,62\%}{22,4} = 0,2$$

$$\frac{3,5 + 3,5 + 0,2}{18} \cdot 100\% = 0,4$$

жауабы:  $m(B) = 0,4$

$w(\text{Fe}) = 22,8\%$   
 $w(\text{Cl}) = 26,6\%$   
 $w(\text{N}) = 20,4\%$   
 $w(\text{O}) = 29,2\%$

$\text{Fe}_x + \text{N}_y + \text{Cl}_z \rightarrow \text{Fe}_x\text{N}_y\text{Cl}_z$   
 $w = \frac{22,8 \cdot 22,0}{24,64} = 20,4\%$   
 $w(\text{Cl}) = \frac{m(\text{Cl})}{m(\text{Fe} + \text{Cl})} \cdot 100\%$   
 $w(\text{N}) = \frac{20,4}{22,84} \cdot 100\% = 90,2\%$

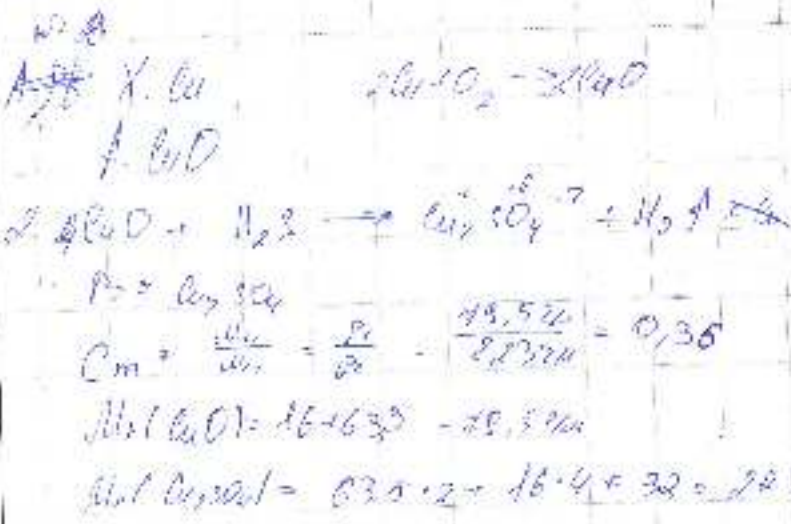
2. Возможно  
 $\rho = 1,45 \text{ г/см}^3$   
 $v = \frac{m}{V}$   
 $w = 25\%$

Решение  
 $25\% = \frac{m}{22,8} \cdot 100\%$   
 $m = 5,70 \text{ г}$   
 $v = \frac{m}{V} = \frac{5,70 \text{ г}}{1,45 \text{ г/см}^3} = 3,93 \text{ см}^3$

Определим  $w(\text{N}) = 90,2\%$   
 $\text{N}_x + \text{Cl}_y$

$\text{Fe} + \text{N}_2 + \text{Cl}_2 \rightarrow \text{Fe}_x\text{N}_y\text{Cl}_z$   
 1)  $\text{Na}^+ \text{Br}^- + \text{Na}^+ \text{Br}^- + 2\text{H}_2\text{SO}_4 \rightarrow 2\text{Na}^+ \text{SO}_4^{2-} + 2\text{HBr} + \text{H}_2\text{O}$   
 2)  $4\text{HCl} + \text{O}_2 \rightarrow 2\text{H}_2\text{O} + 2\text{Cl}_2$   
 $\text{Cl}^0 + 1\text{e}^- \rightarrow \text{Cl}^-$   
 $\text{O}^{0} + 2\text{e}^- \rightarrow \text{O}^{2-}$   
 3)  $\text{Cl}^+ \text{Cl}_2 + \text{KNO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{K}_2\text{SO}_4 + \text{KNO}_3 + 4\text{HCl} + 2\text{H}_2\text{O}$

$\left( \begin{array}{l} \text{Cl}^+ + 2\text{e}^- = \text{Cl}^0 \\ \text{O}^{0} + 2\text{e}^- = \text{O}^{2-} \end{array} \right) \left| \begin{array}{l} 15 \\ 5 \end{array} \right| \left( \begin{array}{l} 2 \\ 1 \end{array} \right) \left( \begin{array}{l} 6 \\ 6 \end{array} \right)$   
 $\left( \begin{array}{l} \text{Cl}^+ + 2\text{e}^- = \text{Cl}^0 \\ \text{N}^{+5} + 5\text{e}^- = \text{N}^{0} \end{array} \right) \left| \begin{array}{l} 10 \\ 2 \end{array} \right| \left( \begin{array}{l} 2 \\ 5 \end{array} \right) \left( \begin{array}{l} 6 \\ 6 \end{array} \right)$



Задача

1. CuO

$m(CuO) = 100$

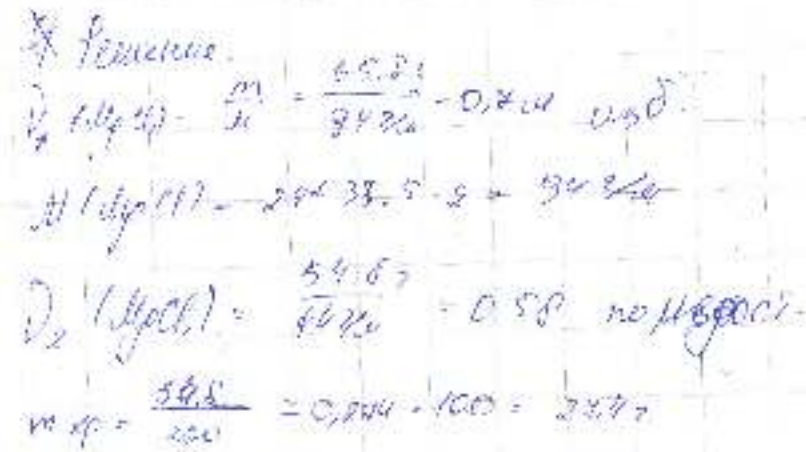
$m(H_2) = 100$

$m(Cu_2O) = 100$

$m(H_2O) = 100$

Искомое?

$m(Cu) = ?$



2. Задача

$m(A) = 0,28$

$V(HCl) = 50$

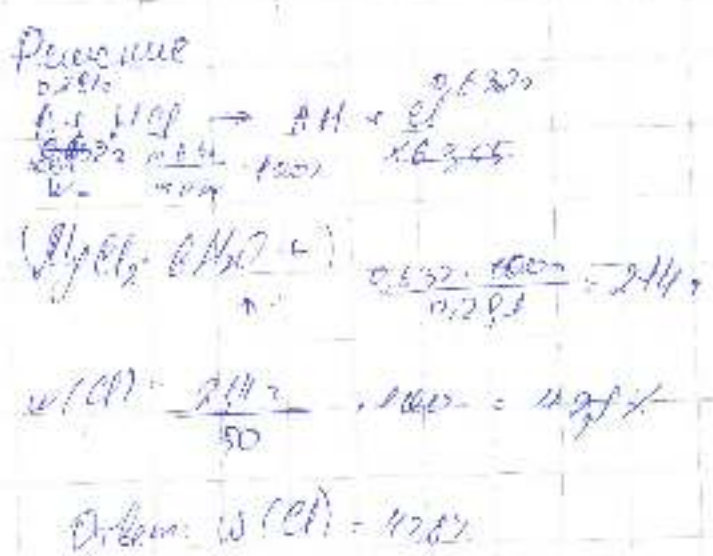
$D(HCl) = 1,2$

$V(H_2O) = 100$

$m(H_2O) = 0,28$

Искомое?

$\omega(Cl) = ?$









Тәжірибесі  
 $m(\text{MgSO}_4) = 22,8 \text{ г}$   
 $V(\text{O}_2) = 24,84 \text{ л}$   
 $M_p = 125$   
 $M_k = (\text{O}, \text{Mg}, \text{O})$

Шешуі: №1  
 $2\text{MgSO}_4 + \text{O}_2 \Rightarrow 2\text{MgO} + 2\text{SO}_2$   
 $M_r(\text{MgSO}_4) = (24 \cdot 2) + 32 + 16 \cdot 4 = 140$   
 $M_r(\text{O}_2) = 16 \cdot 2 = 32$   
 $M_r(2\text{MgO}) = (24 \cdot 2) + 16 = 44$   
 $M_r(2\text{SO}_2) = 32 + (16 \cdot 2) = 64$   
 $V(\text{MgSO}_4) = \frac{22,8 \text{ г}}{140} = 0,1628 \text{ моль}$   
 $V(\text{O}_2) = \frac{24}{8} = 3 \text{ моль}$   
 $M_p = 1,25 \cdot 0,5 \cdot \frac{8}{\text{моль}} = 5 \text{ г}$

$m(\text{K}_2\text{O}) = \frac{24,5}{2,5} = 9,8$   
 $M_p(0,5 - 1,185) = 0,5$   
 жауабы: 0,5

№3  
 Тәжірибесі

- 1)  $\text{I}_2 + 2\text{Na}_2\text{S}_2\text{O}_3 \rightarrow 2\text{NaI} + 2\text{Na}_2\text{S}_2\text{O}_4$
- 2)  $\text{NaBr} + \text{NaBrO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{NaBr} + \text{H}_2\text{BrO}_3$
- 3)  $2\text{KCrO}_4 + \text{Cl}_2 + 4\text{KOH} \rightarrow 2\text{K}_2\text{CrO}_4 + 2\text{KCl} + 2(\text{OH})_2$
- 4)  $\text{CrCl}_3 + 2\text{KNO}_3 + 2\text{K}_2\text{CO}_3 \rightarrow \text{K}_2\text{CrO}_4 + 2\text{KNO}_2 + 2\text{CO}_2 + 2\text{KCl}$
- 5)  $\text{CaH}_2 + \text{HNO}_3 \rightarrow \text{Ca}^{2+} + \text{H}_2\text{O} + \text{N}_2$

№4  
 Тәжірибесі

$m(\text{MgCl}_2) = 100 \text{ г}$   
 Шешуі:  
 $M_r(\text{MgCl}_2) = 24 + 35,5 \cdot 2 = 97$   
 $m = \frac{97}{100} = 0,97$   
 $M_p = 85,8 - 54,8 = 31$   
 $\frac{11}{0,52} = 21,15$



№ 2

Железные:  
Ar(FeSO<sub>4</sub>) = 56 + 32 + 16 · 2 = 152

Углерод:



$$Ar(FeSO_4) = 56 + 32 + 16 \cdot 2 = 152$$

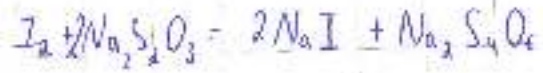
$$Ar(O_2) = 16 \cdot 2 = 32$$

$$Ar(FeO_2) = 56 + 16 \cdot 2 = 88$$

$$Ar(SO_4) = 32 + 16 \cdot 4 = 96$$

3. \*\*

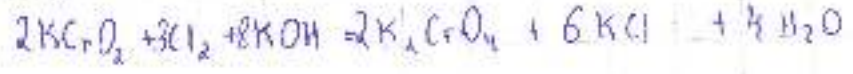
Реакция №1



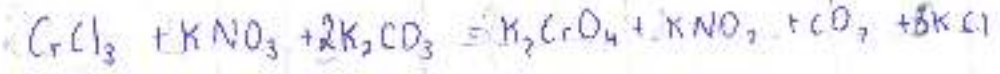
Реакция №2



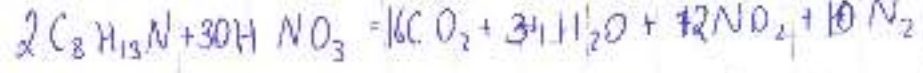
Реакция №3



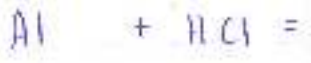
Реакция №4



Реакция №5



1. \*\*



$n(CO_2) = 24,64 \text{ м}$



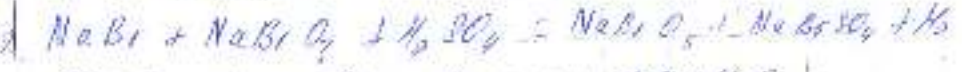
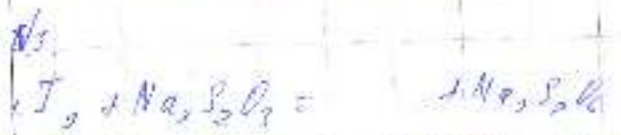
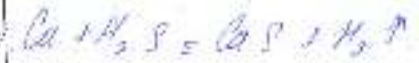


N1.  
 $Al_2O_3 + HCl = AlCl_3 + H_2O$   
 27,000      27,000  
 102,000      22,800  
 M · 1,05 = X

X = 0 (тонна)



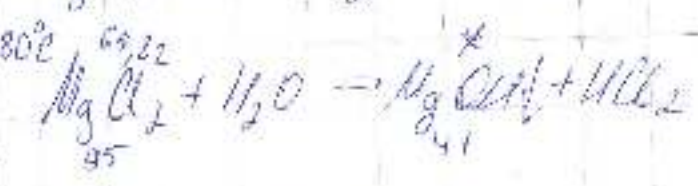
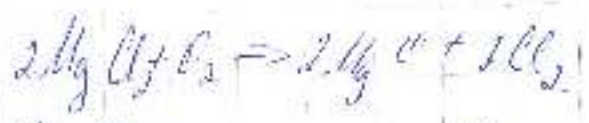
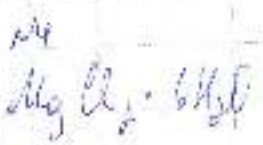
Q = 80,62%



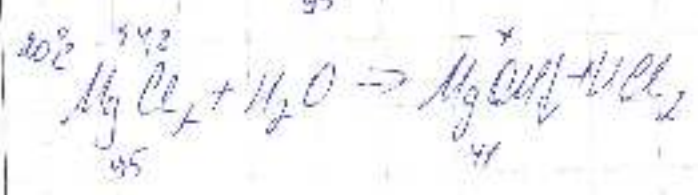
n(MgCl) = 63,8 - 54,8 = 9

n(MgCl(OH)) = 100 - 9 = 91

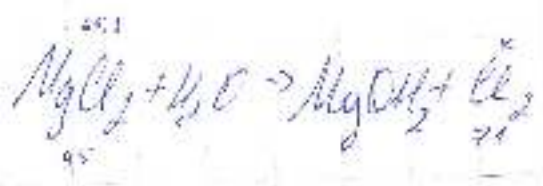




$x = \frac{69,22 \cdot 41}{95} = 29,392$



$x = \frac{54,3 \cdot 41}{95} = 23,652$



$x = \frac{65,22 \cdot 71}{95} = 48,7$

$\omega(Cl) = \frac{48,7}{71} \cdot 100 = 68,73\%$