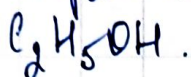


№1.

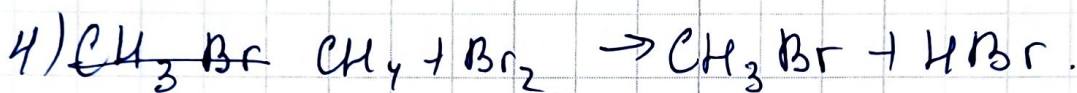
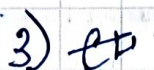
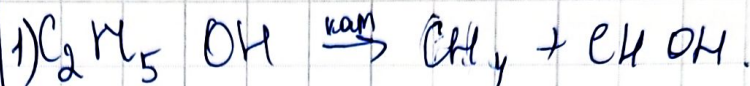
Берілгені:



X қосылмасы:

ГК: 1, 2, 3, 4.

Шешуі:



CH_3Br - бромэтан түзіледі, кәсіне бромсутек қосылмасы түзіледі.

~~Бромэтан~~ бромэтан болып бір сутектің орнына сады, ал қалған бром мен сутек қосылмасы бром сутек түзеді.

№2.

Берілгені:



$D_{(H_2)} = 21,25$

Шешуі:

1) күміс пен мыс нитраттарының арасында реакциясының теңдеуін жазсақ.

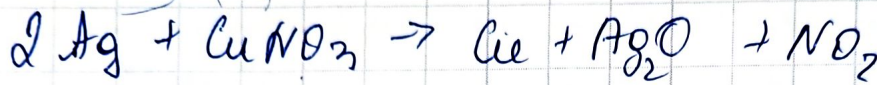
ГК: $w(Ag) = ?$

2) Газ қоспасының молярлік үлестердегі мөлшері:

$$D(H_2) = 21,25$$

$$D = M_r(H_2)$$

$$\text{Қоспаның } M_r (= 21,25 \cdot 2 \Rightarrow 42,5 \text{ болса})$$



$$2 + 1 = 3$$

$$3 = 100\%$$

$$2 = x$$

$$x = 66\% (Ag)$$

$$x = 33\% (Cu(NO_3)_2)$$

$$100\% - 42,5$$

$$46,49\% - x$$

$$x = 19,885$$

$$\approx 19,9\%$$

$$100\% = x + y = 42,5$$

3)

Тік: $\omega(Ag) = ?$ $\omega(Cu(NO_3)_2) = ?$

$$M_r(Ag) = 108$$

$$M_r(Cu(NO_3)_2) = 63 + 14 + 48 = 125$$

$$233 = 100\%$$

$$108 - x$$

$$x = 46,4\% \omega(Ag)$$

$$233 = 100\%$$

$$125 = \cancel{125} x\%$$

$$x = 53,6\% (Cu(NO_3)_2)$$

Ж: $\omega(Ag) = 46,4\%$; $\omega(Cu(NO_3)_2) = 53,6\%$

№3.

Берілгені:

X металл.

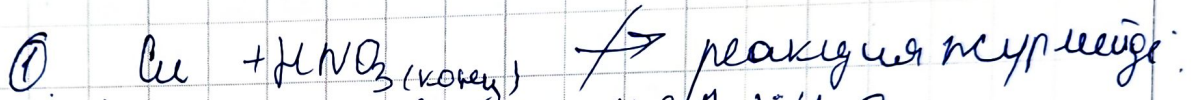
$$M(H_2S) = 5.865 \text{ ч.}$$

+1к: X-металл.

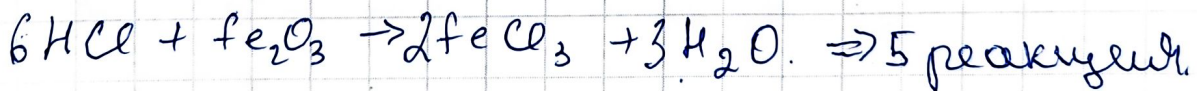
Шешуі:

X-металл - и себебі.

атмосферамен қарнасуы
суз қосылысында еркі алынан
ерітіндінің көгілдір түске
боялуына әкеледі.



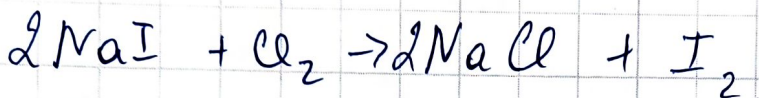
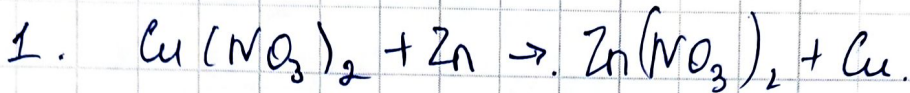
3) X металлы концентрленген азот қосылышы-
мен е да ерімейді



A - Fe_2O_3

B $\rightarrow FeCl_3$ - қызыл қызыл түсті.

№4.

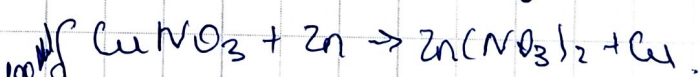


Берілгені:

ρ (ерітінді) = 1,18 г/мл
V = (қоспа) 100 мл

Шешуі:

1) Реакциялар теңдеулері:



ТЗК: m(Zn) = ?

2) Ерітіндідегі тұздардың массалық үлестерін тең ететін ескерсек: V(CuNO₃) = 50 мл = 0,05 л

0,05 л · x

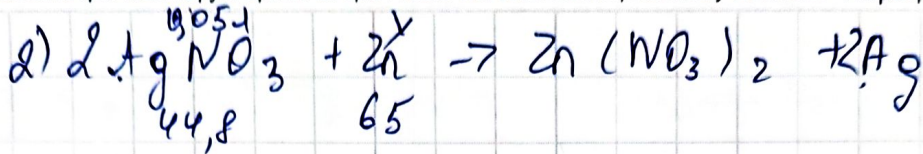
V(AgNO₃) = 50 мл = 0,05 л



22,4 65

$$x_1 = \frac{65 \cdot 0,05}{22,4} = \cancel{0,145} \text{ л (Zn)}$$

~~x₂~~ егер а мән есептесек ⇒ $\frac{0,05 \cdot 22,4}{22,4} = 0,05 \text{ л}$



$$x = \frac{65 \cdot 0,05}{44,8} = 0,722$$

$$x_2 = \frac{22,4 \cdot 0,05}{44,8} \rightarrow 0,025 \text{ л}$$

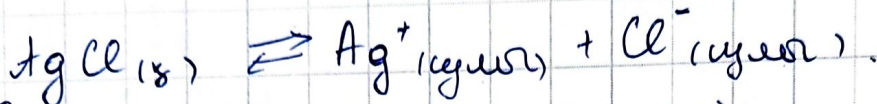
$$\text{мс: } 0,1452; 0,722)$$

3) Тік: $\text{M}(\text{KMnO}_4) - ?$

мсе +

Қатысушының шешімдерін толтыруға арналған өріс / Поле для заполнения решений участника

N5



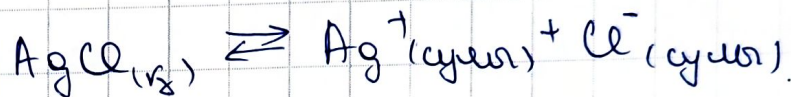
Берілгені:

ЕӨ (AgCl) = $1.77 \cdot 10^{-10}$
ЕӨ - K_{sp} .

Шешуі:

1) Ең алдымен күміс хлоридінің судағы еруін реакция түрінде мағына көрсетеміз.

ПК: AgCl \Rightarrow судағы ерігіштік.



2) AgCl-дың судағы ерігіштігін табу үшін.

AgCl-дың Mr-ын мағына аламыз.

$$M_r(\text{AgCl}) = 35,5 + 108 = 143,5 \text{ г/моль}$$

3) AgCl-дың судағы ерігіштік ~~молі~~ ~~молі~~ [2/1] өлшем бірлігінде болуын ескерсек:

инде болуын ескерсек:

$$\frac{M_r(\text{AgCl})}{\nu_{\text{к.к}}(\text{AgCl})} \Rightarrow \frac{2 \text{ моль}}{1 \text{ моль}}$$

$$\Rightarrow \frac{143,5}{22,4} = 6,40625 \text{ г/л. болады.}$$

$$4) \frac{E\text{O}(\text{AgCl})}{\nu_{\text{к.к}}(\text{AgCl})} \Rightarrow \frac{1,77 \cdot 10^{-10}}{6,40625 \text{ г/л.}} = 2 \cdot 10^{-11} \text{ г/л.}$$

жауабы: AgCl-судағы ерігіштігі $= 2 \cdot 10^{-11} \text{ г/л.}$

№5.

2) ~~қа~~

Берілгені:

H_2SO_4 - күкірт қышқылы.

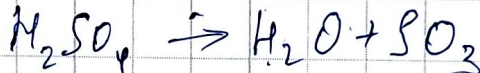
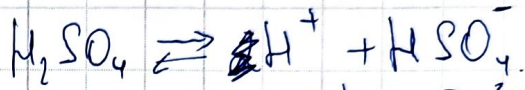
$c(H_2SO_4) = 0,1 \text{ моль л}^{-1}$.

Тік: pH - ?

диссоциация сәтосі.

Шешуі:

① H_2SO_4 диссоциация сәтосіне тағамыз.



$0,1 \text{ моль л}^{-1} \Rightarrow 0,1 = 1 \cdot 10^{-1}$ ендеме.

pH мәні: 1 ге тең болады.

не: күкірт қышқылының суға ерітіндісінің

pH мәні = 1 ге тең.

3) Берілгені:

$c(CH_3COOH) = 0,1 \text{ моль л}^{-1}$

$pK_a = 4,76$

Шешуі:

д - диссоциация-
лану дәрежесін
табуға %-дық көрсеткіш-
пен көрсетуіміз керек.
Еол үшін $\cdot 100\%$ - көбейтеміз

Тік: $d = ? \%$

$$d = \frac{c}{p.K_a} \cdot 100\% \Rightarrow \frac{0,1}{4,76} \cdot 100\% \Rightarrow 2\%$$

не: сірке қышқылының $d = 2\%$

сн-11-1

Шифрды ұйымдастырушы толтырады
Шифр заполняется организатором

Қатысушының шешімдерін толтыруға арналған өріс / Поле для заполнения решений участника Парақ / Страница № 8

№5.

Берілгені:

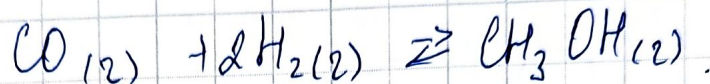
$$k = 5,8$$

$$t = 120^\circ\text{C}$$

$$\text{Т.к. } \eta = ?$$

Шешуі:

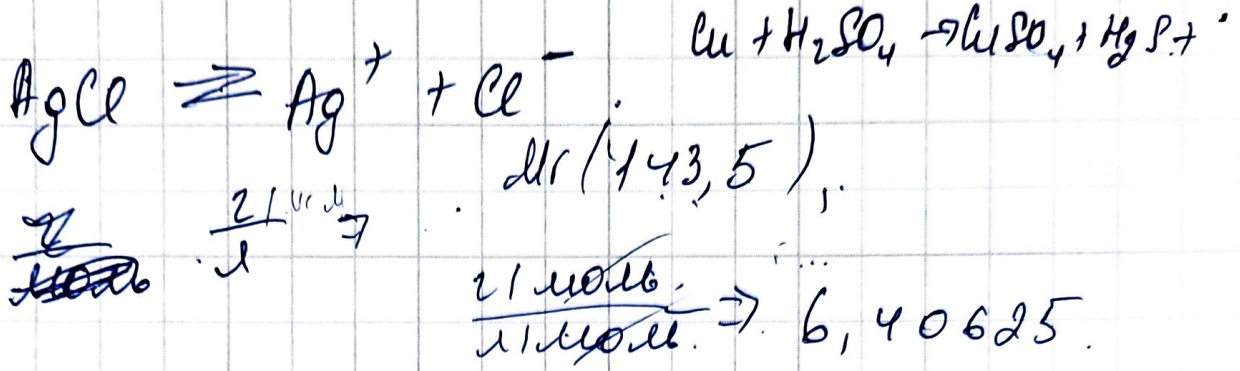
1) Реакцияның теңдеуі:



$$k = \frac{[\text{CH}_3\text{OH}]}{[\text{CO}] \cdot [\text{H}_2]^2} \Rightarrow \frac{x}{1 \cdot 2} = 5,8 \cdot 0,5$$

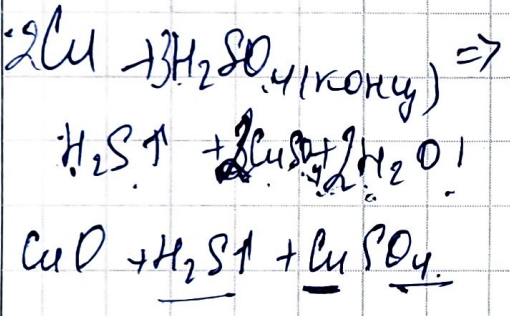
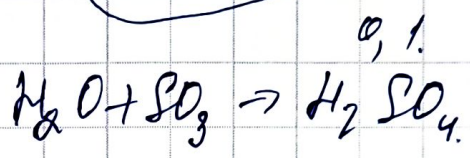
$$x = 4,6$$

$$\eta = \frac{m_{\text{факт}}}{m_{\text{теор}}} \cdot 100\% \Rightarrow \frac{4,6}{5,8} \cdot 100\% = 79,3\%$$

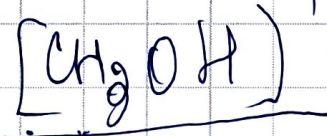


$108 \cdot 10^{-9}$

$2 \cdot 10^{-11}$



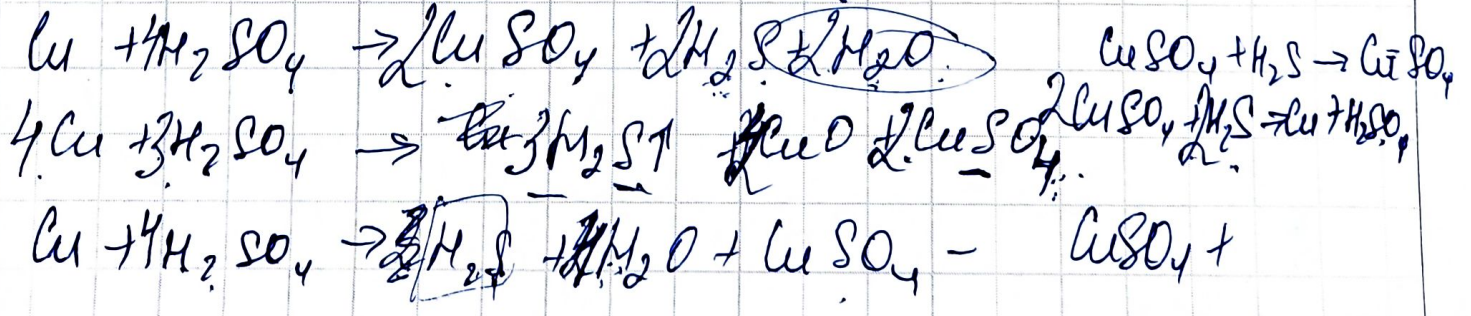
$C = d \cdot pka$
 $\% = \frac{C \cdot \text{моль}}{4,76} \cdot 100\%$



$\begin{array}{r} CO \\ \times \\ \hline 1 \cdot 2 = 5,8 \\ 11,6 \text{ ж.} \end{array}$

2 моль
 $(2 \cdot 2)$

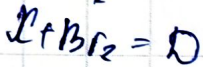
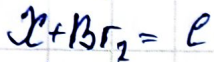
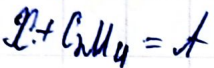
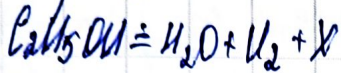
6387,44



N1

Шешуі:

Берілгені



Табу керек:

X, A, C, D - ?

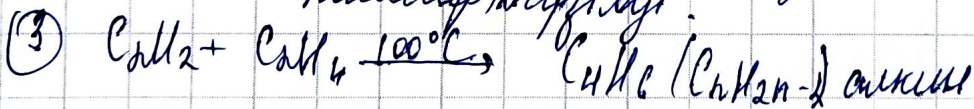
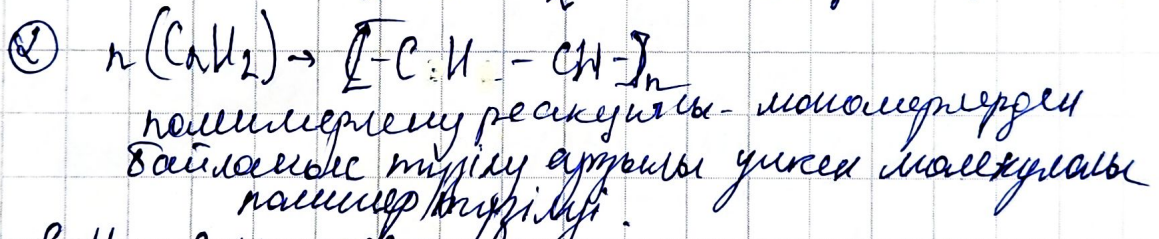
$C_nH_{2n}O$ - біратомды спирт, өзіне n малкоғалы
кислород, су.

Катонизатор - реакциясы тоқырамайтын,
бірақ бұл реакцияға қатыспайтын зат.

Сутектің қосылу реакциясы делінетін
реакция барынша өнім ретінде H_2

(B) түзілетін реакция.

Суратсыздық реакциясы өнім ретінде
 H_2 бөлінетін реакция.

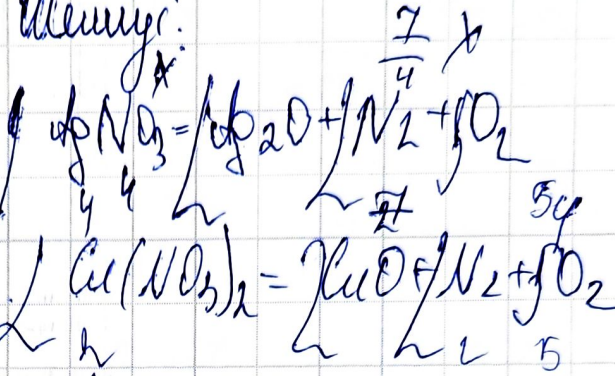


Мағары: $C_nH_{2n} - X$, ③ $C_{2n}H_{4n}$ түзіледі, ④ $C_nH_{2n}Br_2$,
 $C_nH_{2n}Br_4$ түзіледі.

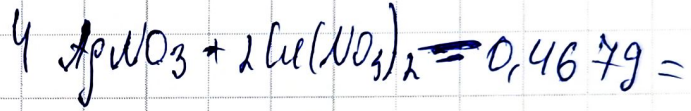
№

Берілгені
және $(AgNO_3, Cu(NO_3)_2)$
 $M(Ag) = 108, M(Cu) = 64$
және $M(NO_3) = 62$
Т.к. $w(AgNO_3) = 47\%$

Шешуі:



$M(AgNO_3) = 108 + 2 \cdot 62 = 232$

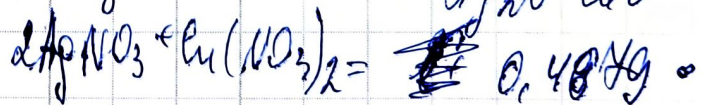
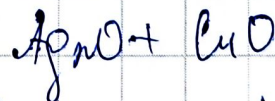
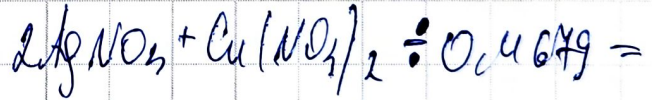


$$w = \frac{148}{322} = 47\% = 0,5 \text{ моль } Ag_2O + 2 \text{ моль } CuO$$

$$60 \cdot \frac{7}{4} x + 5y =$$

дәлелді: $w = 47\%$
 $n = 0,5$

$$108x + 300y = 42,5$$

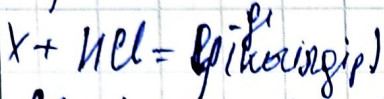


$$340 + 188 = 0,46$$

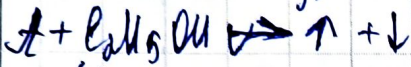
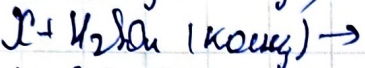
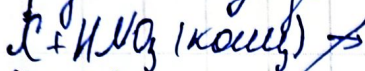
$$x = \frac{0,4679 + 332 + 80}{148}$$

№3

Берілгені:

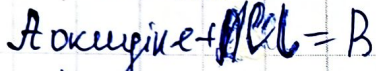


Cr-ті ақшоғы қыста тағыл.

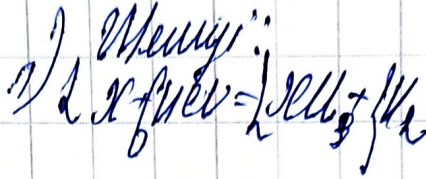
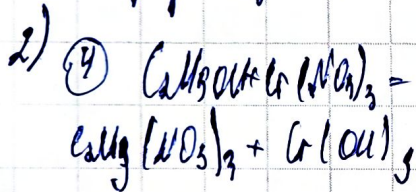


$\rho(\uparrow) = 1,5\%$

\downarrow - тағыл



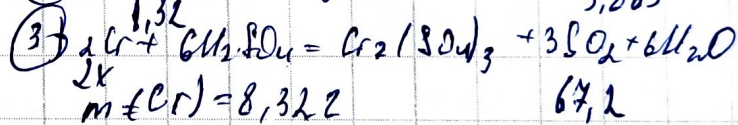
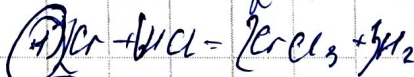
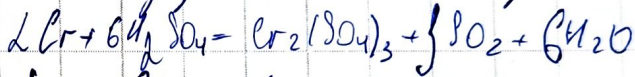
B - қарым-қосын



$CrCl_3$ - тағыл, яғни $CrCl_3$.

X - Cr, шара баура дауалықтары, ақшоғы тағыл түсінігі арналыра.

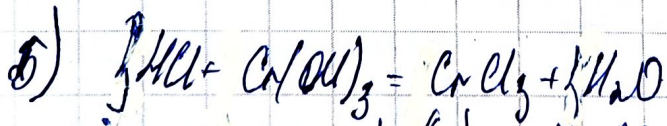
Cr + HNO_3 (қосық) себебі, металлы $Cr(NO_3)_3$ қосынды түсінігі арналыра, яғни қосынды металлы.



$m(Cr) = 8,322$

$V(SO_2) = 5,865 \text{ л}$

$x = \frac{8,322 \cdot 67,2}{5,865} = 95,3 \text{ г}$



$w(CrCl_3) = \frac{m(Cr)}{Mn(CrCl_3)} = \frac{52}{158,5} \cdot 100\% = 33\%$

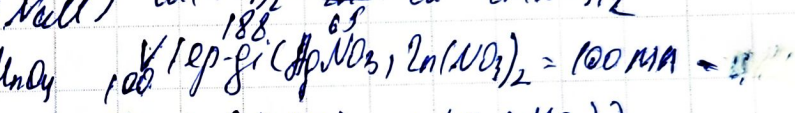
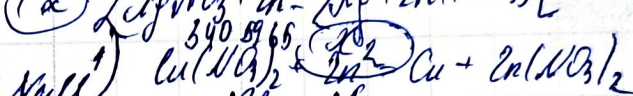
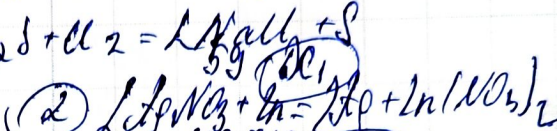
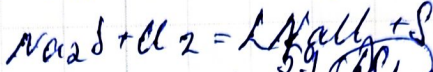
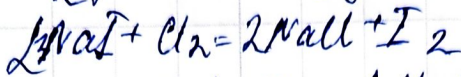
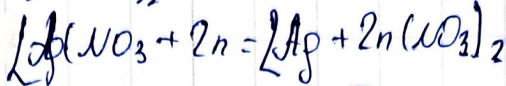
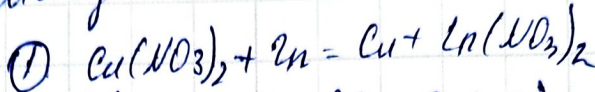
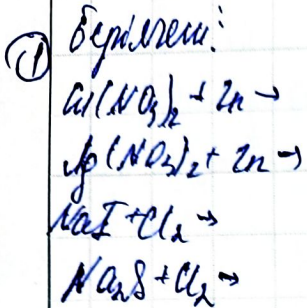
$Mn(CrCl_3) = 39,53 + 92 = 158,52$

A - $Cr(OH)_3$, B - $Cr(OH)_3$.

Маңады: A - Cr, B - $Cr(OH)_3$, A -

№4

Шешуі:



$Q_1 = 11,242$

$Q_2 = 20,392$

$M_{Ag}W = 1,18$

$w_1(AgNO_3) = w_2(Zn(NO_3)_2)$

$\rho(AgNO_3) + \rho(Zn(NO_3)_2) = 1,821 \text{ г/см}^3$

④ $m(Zn) = Q_1 + Q_2 = 31,662$



$v(NaCl) = 1 \text{ моль} = 0,01 \text{ моль}$

$c(NaCl) = 5 \text{ М}$

$n - CV = 0,01 \cdot 5 = 0,05 \text{ моль}$

$\begin{cases} 170x = 188y \\ x + 2y = 0,05 \end{cases}$

$35 - 340y = 188y$

$x = 0,05 - 2y$

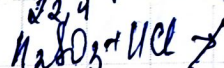
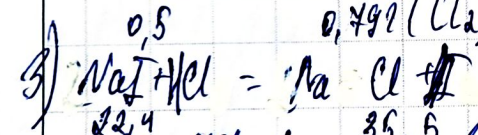
$170(0,05 - 2y) = 188y$

$x = 0,05 - 2y$

$y = 0,056$

$x = 0,05 - 0,112 = 0,062$

Мәңгісі: $m(K_2MnO_4) = 1,92$



$v(NaI, H_2SO_4) = 50 \text{ мА} = 0,5 \text{ А}$

$v(NaI + Pb(NO_3)_2) = 2NaNO_3 + PbI_2$



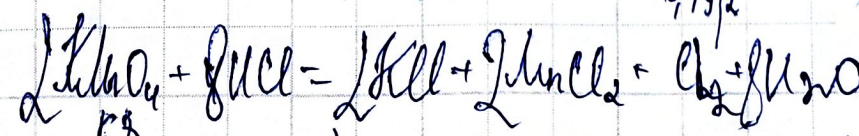
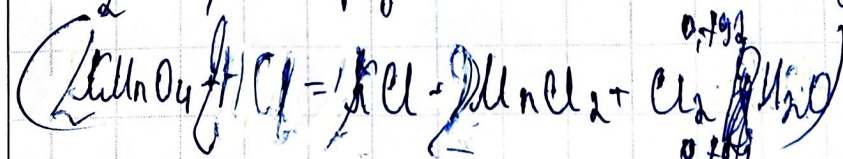
$v = 0,6 \text{ мА}$

$n = 0,06 \text{ моль}$

$c(Pb(NO_3)_2) = 0,1 \text{ М}$

$v(Pb(NO_3)_2)$

$v(NaI + H_2SO_4 \text{ ер-гі}) = 1 \text{ мА}$



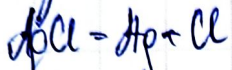
$m(K_2MnO_4) = 166 \cdot 0,0112 = 1,92$

15)

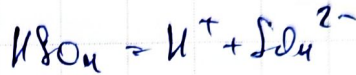
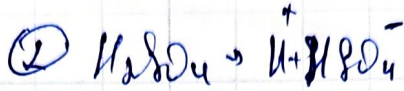
Мәшүі

Берілгені:

①



$E_0; K_{sp} = 1,77 \cdot 10^{-10}$



$C(0,1 \text{ моль}) = pH - ?$

$pH = 10^{-1} = 10 \%$

Ғаду керек: $AgCl$ сураты
сүлкімші;

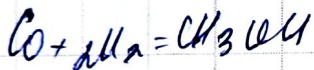


$C = 0,1 \text{ моль л}^{-1}$

$\alpha - ? \quad pK_a = 4,76$

$\alpha = C \cdot \alpha \cdot n$

$\alpha = 0,1 \cdot 4,76 \cdot 0,4,76 = 4,76 \%$



$T = 120^\circ C$

$K = 5,8$

$P_{CO} = 1 \quad P_{H_2} = \alpha$

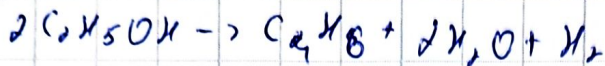
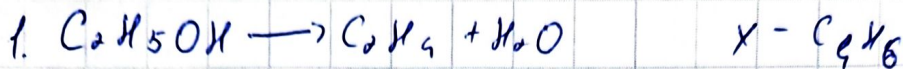
$120^\circ C \quad \eta - ?$

$\frac{C[CH_3OH]}{C[CO] \cdot (C[H_2])^2}$

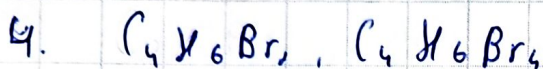
$\approx 5,8 = \frac{C[CH_3OH]}{4 \cdot 1} \approx [CH_3OH] = 23,2$

$\eta = 23,2$

№1.



2. қиындық эбокиппен жекетеліріп, қауіпсіз пайда болмады



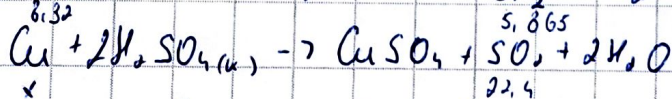
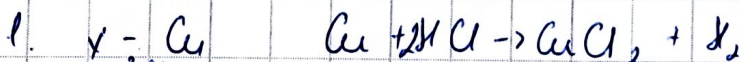
№2.



2. $m(NO_2) = 2 \cdot 21,25 = 42,5$

$\int 4x + 4y = 42,5$

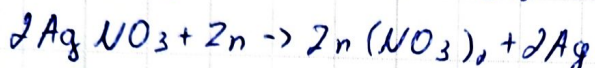
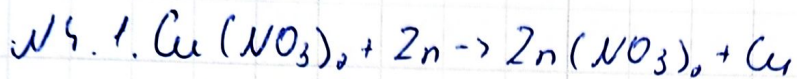
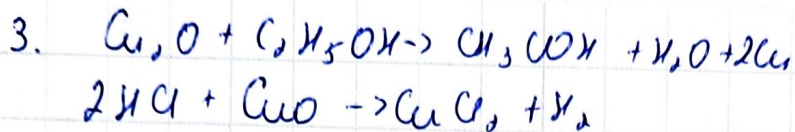
№3.



$X = 64 \rightarrow Cu$

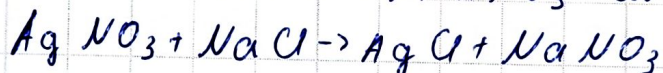
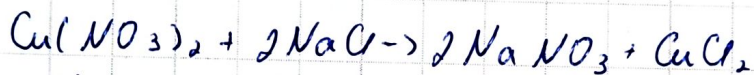
2. металл қабаты пайда болмады.

Қатысушының шешімдерін толтыруға арналған өріс / Поле для заполнения решений участника Парақ / Страница №



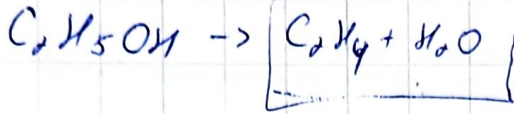
2. $m_{Cu} = 100 \cdot 1,18 = 118$

$n_{Cu} = \frac{m}{M} \rightarrow 5 = \frac{n}{0,01} \rightarrow n = 5 \cdot 0,01 = 0,05 \text{ моль}$

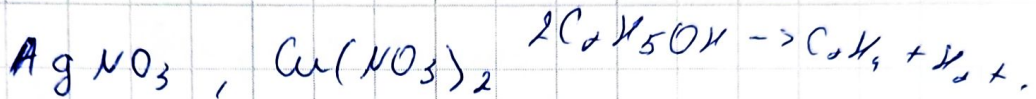


$$\begin{cases} x + 2y = 118 \\ 2x + y = 0,05 \end{cases} \quad \begin{matrix} x = 78,65 \\ y = 39,35 \end{matrix}$$

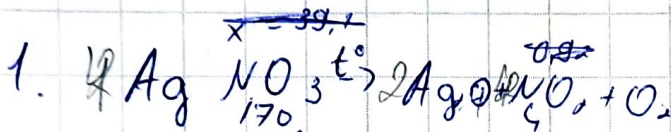
3.



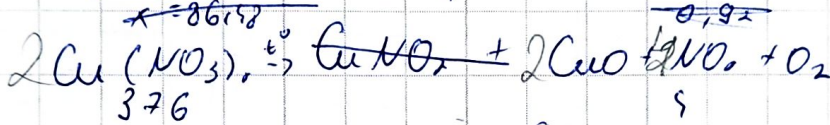
~~C₂H₅OH~~



2)



$$M_r = 2 \cdot 21,25 = 42,5$$

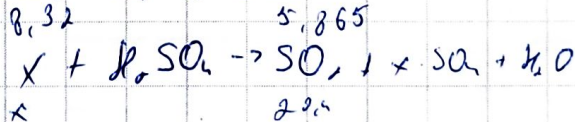
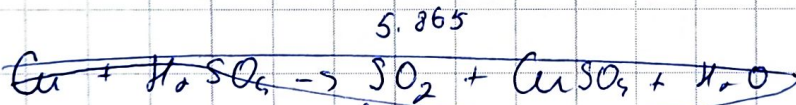


2.

$$4x + 4y = 42,5$$

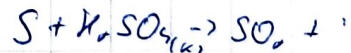
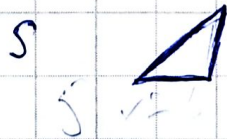
$$\begin{cases} 4x + 4y = 42,5 \\ x \end{cases}$$

3)



$$Cu = \frac{n}{V} \quad n = 0,05$$

$$5 = \frac{n}{10}$$



$$p \cdot M_r =$$

$$236 - 4y + y = 0,05$$

$$-3y = -235,95$$

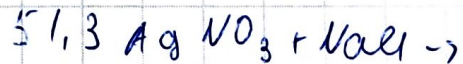
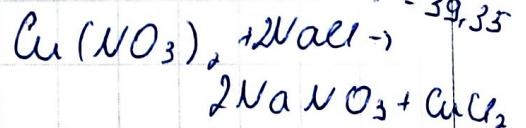
$$y = 78,65$$



$$\begin{cases} x + 2y = 118 \\ 2x + y = 0,05 \end{cases}$$

$$x = 118 - 2y$$

$$2(118 - 2y) + y = 0,05$$



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