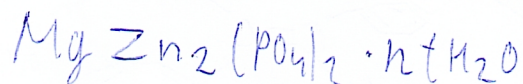


1 2 3 4 5 6 7 8 9 10
6 0 8 8 0 2 0 12 4 2

425

$$\omega(\text{Zn}) = 31,25\%$$

2.1



$$M(\text{MgZn}_2(\text{PO}_4)_2 \cdot n\text{H}_2\text{O}) = 246 + 18n$$

$$\omega(\text{Zn}) = \frac{m(\text{Zn})}{M(\text{MgZn}_2(\text{PO}_4)_2 \cdot n\text{H}_2\text{O})} = \frac{130}{344 + 18n} = 0,3125$$

$$\frac{130}{344 + 18n} = 0,3125 \quad 130 = 104,5 + 5,625n$$

$$5,625n = 25,5 \quad n = 4,5$$

Минерал: $\text{MgZn}_2(\text{PO}_4)_2 \cdot 4\text{H}_2\text{O}$



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10 X 0 79

23,025% 2.1
 $H_x B_y Cl_z$ 44,31%

$$w(H) = 100\% - w(B) - w(Cl) = 100\% - 23,025\% - 44,31\% = 2,665\%$$

Будем брать 100 г вещества, тогда

$$m(B) = 23,025(г)$$

$$M(B) = 112 \text{ г/моль}$$

$$n(B) = \frac{m}{M} = \frac{23,025(г)}{112 \text{ г/моль}} = 2,0932 \text{ моль}$$

$$m(Cl) = 44,31(г)$$

$$M(Cl) = 35,5 \text{ г/моль}$$

$$n(Cl) = \frac{m}{M} = \frac{44,31(г)}{35,5 \text{ г/моль}} = 2,0932 \text{ моль}$$

$$m(H) = 2,665(г)$$

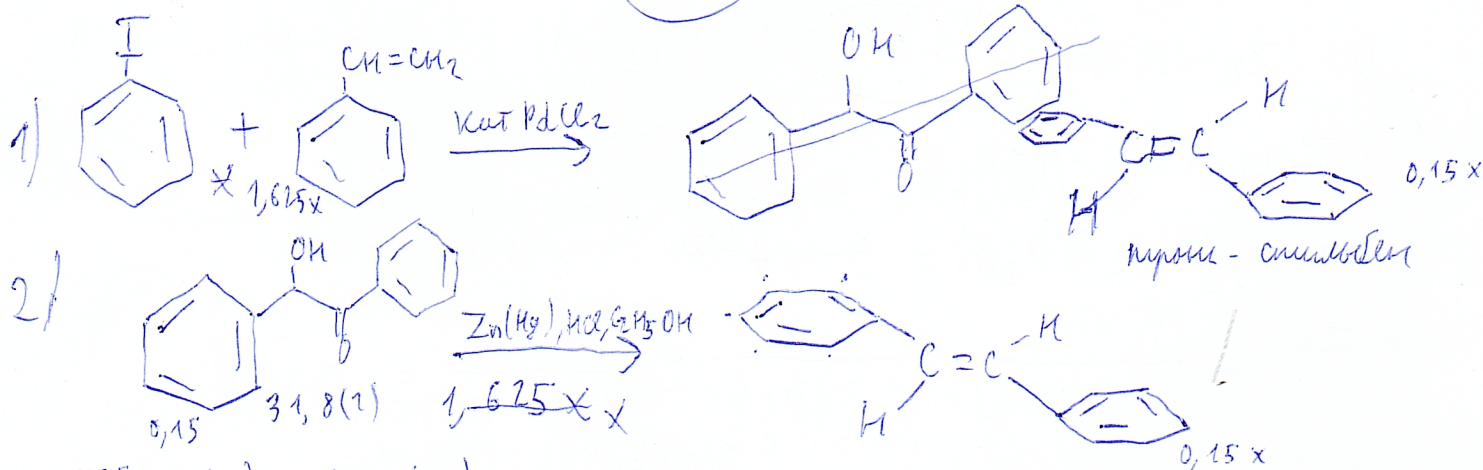
$$M(H) = 1 \text{ г/моль}$$

$$n(H) = \frac{m}{M} = \frac{2,665(г)}{1 \text{ г/моль}} = 2,665 \text{ моль}$$

$$n(H) : n(B) : n(Cl) = 2,665 : 2,0932 : 2,0932 = 1,273 : 1 : 1 = 5 : 4 : 4$$

$H_5 Cl_4 B_4$ - молекулярная формула вещества

2.1 w



$$162825 w(2) = w(1)$$

Будем высчитать реакцию 1 $\xrightarrow{1625x}$, тогда $w(2) = x$

$$M(\text{бензоин}) = (C_{14}H_{12}O_2) = 212 \text{ г/моль}$$

$$n(C_{14}H_{12}O_2) = \frac{m}{M} = \frac{31,8(г)}{212 \text{ г/моль}} = 0,15 \text{ моль}$$

$$n(C_{14}H_{12}) = n(C_{14}H_{12}O_2) = 0,15 \text{ моль}$$

$$M(C_{14}H_{12}) = \frac{M(C_{14}H_{12}O_2) \cdot w}{100\% - w} = 0,15x$$



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10 x 0 24

$$T_n(C_8H_8) = n(C_{12}H_{12}) = 0,15x$$

$$M(C_{12}H_{12}) = 180 \text{ г/моль}$$

$$n(C_8H_8) = \frac{T_n}{M} = \frac{0,15x}{1,625x} = 0,0923 \text{ моль}$$

$$m(C_8H_8) = n \cdot M = 0,0923 \cdot 180$$

$$M(C_8H_8) = 104 \text{ г/моль} \quad m(C_8H_8) = n \cdot M = 0,0923 \cdot 104 = 9,6(2)$$

24.1

$$M(C_{12}H_{10}O_5N_2I_3Na) = 144 + 10 + 80 + 28 + 381 + 23 = 666 \text{ г/моль}$$

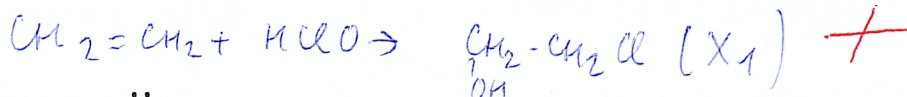
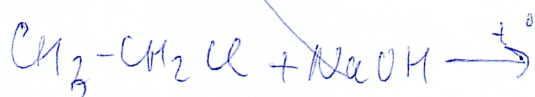
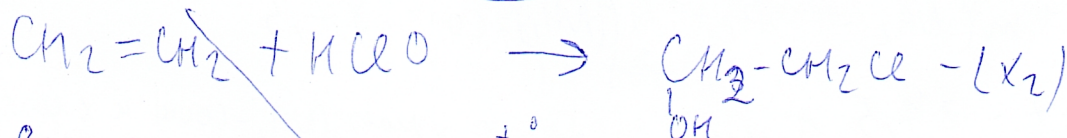
$$m_{\text{пр-ра}} = \rho \cdot V = 1 \text{ г/мл} \cdot 50 \text{ мл} = 50(2)$$

$$m_{\text{пр-в}} = \frac{m_{\text{пр-ра}} \cdot \omega}{100\%} = \frac{50 \cdot 21}{100} = 10,5(2)$$

$$\omega(I) = \frac{m(I)}{M(C_{12}H_{10}O_5N_2I_3Na)} \cdot 100\% = \frac{381}{666} \cdot 100\% = 57,21\%$$

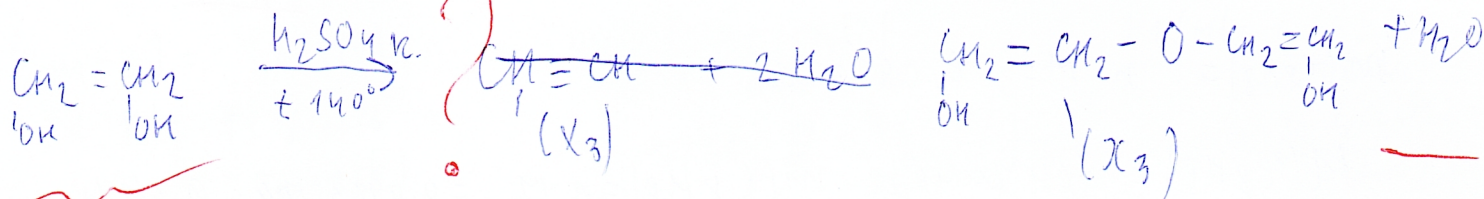
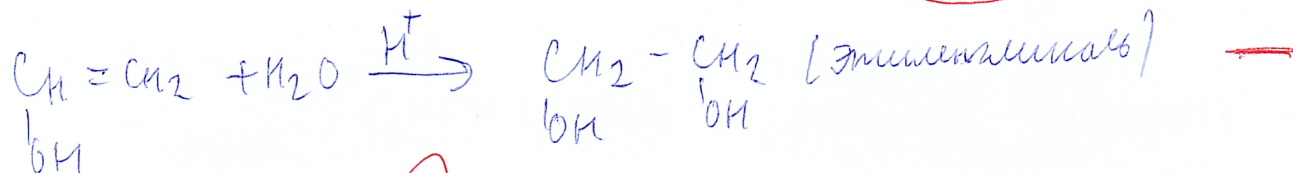
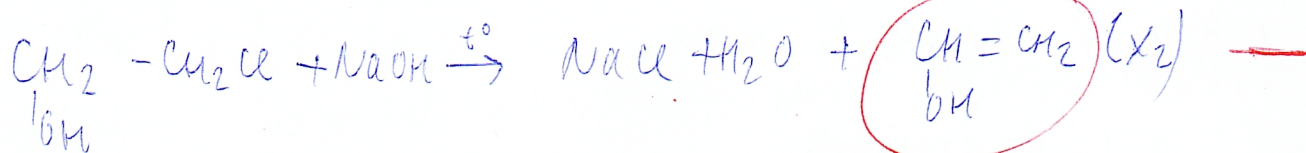
$$m(I) = \frac{m_{\text{пр-в}} \cdot \omega(I)}{100\%} = \frac{10,5 \cdot 57,21}{100} = 6(2)$$

26.1

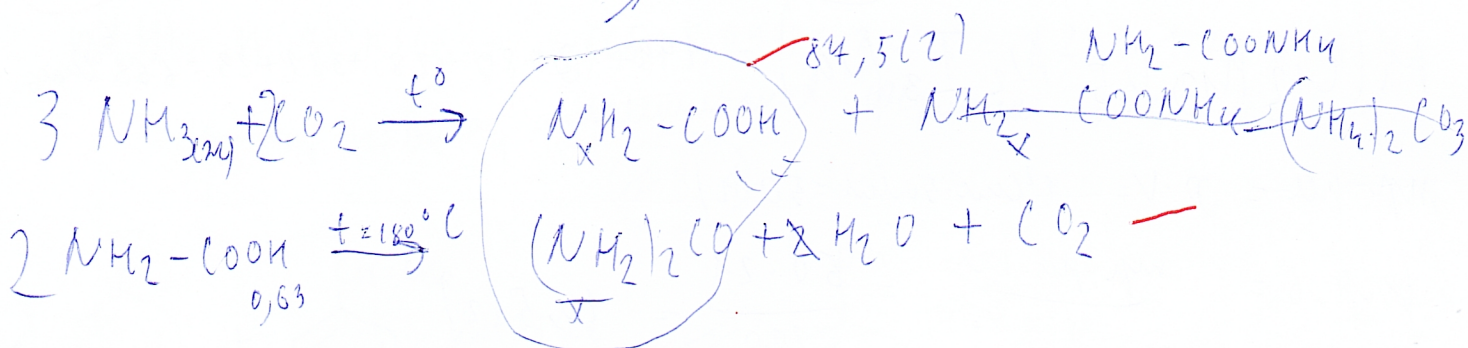


СЕЧЕНОВСКИЙ
УНИВЕРСИТЕТ





№ 4.1



пусть $n(\text{NH}_2\text{COOH}) = x$ моль и $n((\text{NH}_4)_2\text{CO}) = x$ моль

$M(\text{NH}_2\text{COOH}) = 61 \text{ г/моль}$

$$m(\text{NH}_2\text{COOH}) = n \cdot M = x \cdot 61 = 61x$$

$$M((\text{NH}_4)_2\text{CO}) = 60 \text{ г/моль}$$

$$m((\text{NH}_4)_2\text{CO}) = n \cdot M = x \cdot 60 = 60x$$

$$61x + 60x = 84,5 \quad m(\text{NH}_2\text{COOH}) + m((\text{NH}_4)_2\text{CO}) = 84,5$$

$$61x + 60x = 84,5$$

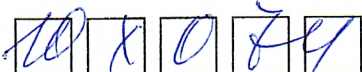
$$M(\text{NH}_2\text{COOH}) = 61 \text{ г/моль}$$

пусть было x моль (NH_2COOH) и x моль $\text{NH}_2\text{COONH}_4$

$$M(\text{NH}_2\text{COONH}_4) = 78 \text{ г/моль}$$



СЕЧЕНОВСКИЙ
УНИВЕРСИТЕТ



$$m(\text{NH}_2-\text{COOH}) = n \cdot M = x \cdot 61 = 61x$$

$$m(\text{NH}_2-\text{COONH}_4) = n \cdot M = x \cdot 48 = 48x$$

$$48x + 61x = 84,5$$

$$109x = 84,5$$

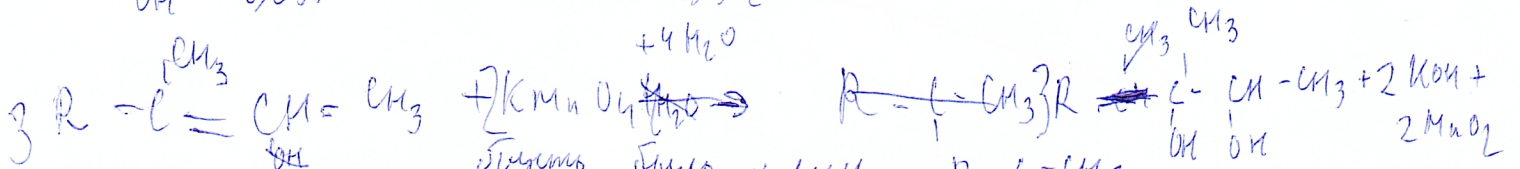
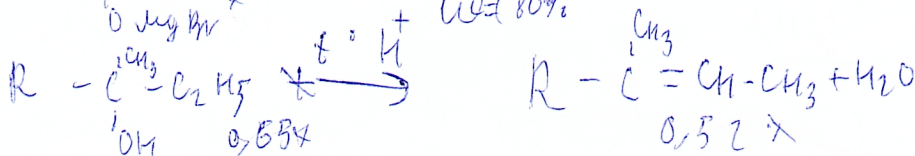
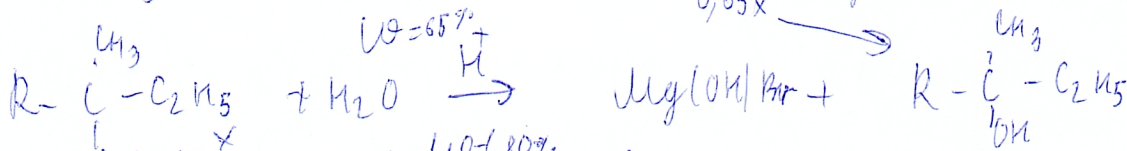
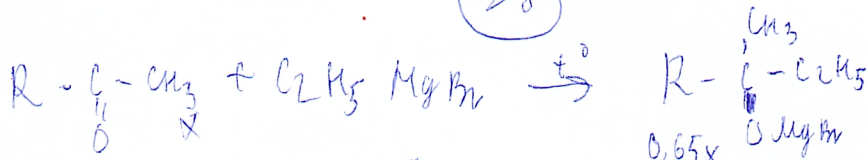
$$x = 0,63 \text{ моль} \quad n(\text{NH}_2-\text{COOH}) = 0,63 \text{ моль}$$

$$n((\text{NH}_2)_2\text{CO}) = 1/2 n(\text{NH}_2-\text{COOH}) = 0,315 \text{ моль}$$

$$M((\text{NH}_2)_2\text{CO}) = 60 \text{ г/моль}$$

$$m((\text{NH}_2)_2\text{CO}) = n \cdot M = 0,315 \cdot 60 = 18,9(2)$$

28



$$M(\text{R}-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-\text{CH}_3) = R + 43 \quad M(\text{R}-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-\text{C}_2\text{H}_5) = M(\text{R}-\overset{\text{CH}_3}{\underset{\text{OMgBr}}{\text{C}}}-\text{C}_2\text{H}_5) = 100$$

$$n(\text{алкена}) = \frac{n(\text{спирт спирта}) \cdot 100}{100} = \frac{0,65x - 86}{100} = \frac{x - 65}{100} = 0,65x$$

$$n(\text{алкена}) = \frac{n(\text{спирт спирта}) \cdot 100}{100} = \frac{0,65x - 86}{100} = 0,52x$$

$$M(\text{R}-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-\text{CH}(\text{OH})-\text{CH}_3) = 89 + R$$

$$(R + 43)x = 1,253 [0,52x(89 + R)]$$

$$Rx + 43x = 115x - 37,14x + 0,65Rx$$

$$Rx + 5,86x = 0,65Rx$$

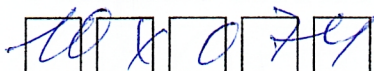
$$R + 5,86 = 0,65R$$

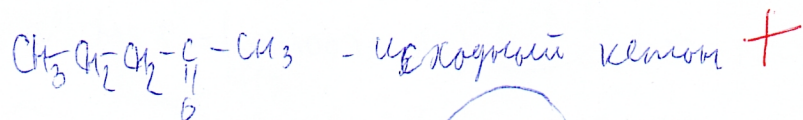
$$0,35R = 5,86 - 15$$

$$R = 43$$

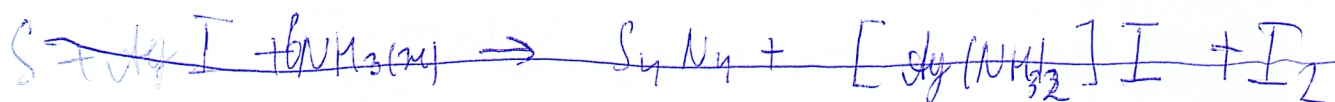


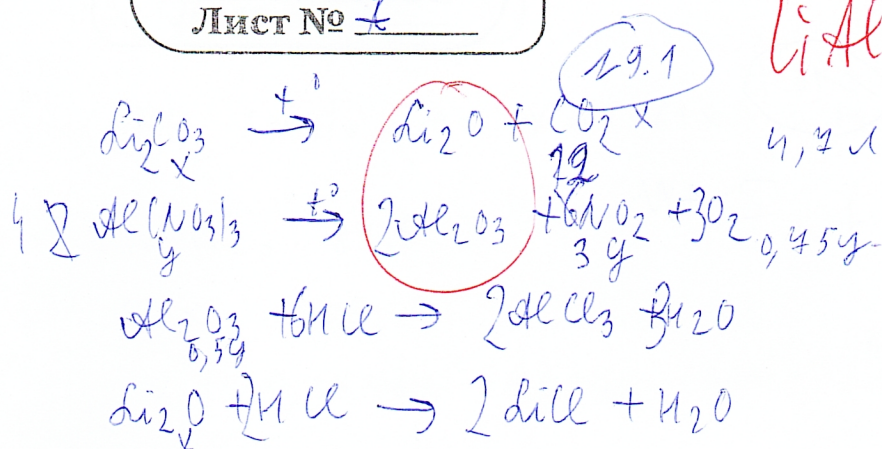
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УНИВЕРСИТЕТ





251





$$T = 243 + t = 243 + 25 = 268^\circ\text{K}$$

$$n = \frac{pV}{RT} = \frac{100,11 \text{ кПа} \cdot 4,4 \text{ л}}{8,314 \text{ Дж/моль} \cdot 298^\circ\text{K}} = 0,19 \text{ моль} +$$

нужно было x моль Li_2CO_3 и y моль $\text{Al(NO}_3)_3$, тогда

$$n(\text{CO}_2) = n(\text{Li}_2\text{CO}_3) = x \quad n(\text{NO}_2) = 3n(\text{Al(NO}_3)_3) = 3y$$

$$n(\text{O}_2) = 3/4 n(\text{Al(NO}_3)_3) = 0,45y$$

$$x + 3y + 0,45y = 0,19 \quad x + 3,45y = 0,19$$

$$m_{\text{р-ра}} = p \cdot V = 1,06 \text{ г/мл} \cdot 100 \text{ мл} = 106 \text{ (г)}$$

$$\frac{106 \text{ (г)} \cdot 100\%}{100\%} = 106 \text{ (г)}$$

$$m_{\text{р-р}}(\text{HCl}) = \frac{m_{\text{р-ра}} \cdot \omega}{100\%} = \frac{106 \text{ (г)} \cdot 100\%}{100\%} = 106 \text{ (г)}$$

$$M(\text{HCl}) = 36,5 \text{ г/моль} \quad n(\text{HCl}) = \frac{m}{M} = \frac{106 \text{ (г)}}{36,5 \text{ г/моль}} = 2,9 \text{ моль}$$

$$n(\text{Li}_2\text{O}) = n(\text{Li}_2\text{CO}_3) = x \text{ моль} \quad n(\text{Al}_2\text{O}_3) = 1/2 n(\text{Al(NO}_3)_3) = 0,5y$$

$$n(\text{HCl}) = 6n(\text{Al}_2\text{O}_3) = 3y \quad n(\text{HCl}) = 2n(\text{Li}_2\text{O}) = 2x \quad n(\text{HCl})_{\text{исх}} = 3y + 2x$$

$$\begin{cases} x + 3,45y = 0,19 \\ 3y + 2x = 0,29 \end{cases}$$

$$x = 0,19 - 3,45y$$

$$3y + 2(0,19 - 3,45y) = 0,29 \quad 3y + 0,38 - 6,9y = 0,29$$

$$-3,9y = -0,09 \quad y = 0,02 \text{ моль}$$

$$x = 0,19 - 3,45 \cdot 0,02 = 0,19 - 0,069 = 0,121 \text{ моль}$$

$$M(\text{Li}_2\text{CO}_3) = 74 \text{ г/моль}$$

$$m(\text{Li}_2\text{CO}_3) = n \cdot M = 0,121 \cdot 74 = 8,954 \text{ (г)}$$

$$M(\text{Al(NO}_3)_3) = 213 \text{ г/моль}$$

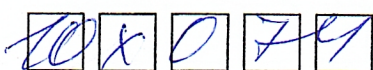
$$m(\text{Al(NO}_3)_3) = n \cdot M = 0,02 \cdot 213 = 4,26 \text{ (г)}$$

$$m(\text{исх}) = m(\text{Li}_2\text{CO}_3) + m(\text{Al(NO}_3)_3) = 8,954 + 4,26 = 13,214 \text{ (г)}$$

$$\omega(\text{Li}_2\text{CO}_3) = \frac{m(\text{Li}_2\text{CO}_3)}{m(\text{исх})} \cdot 100\% = \frac{8,954}{13,214} \cdot 100\% = 67,76\%$$

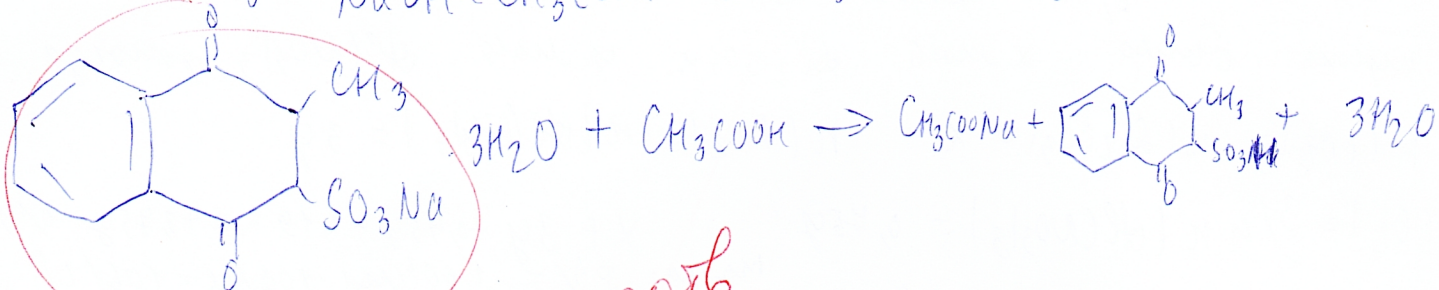
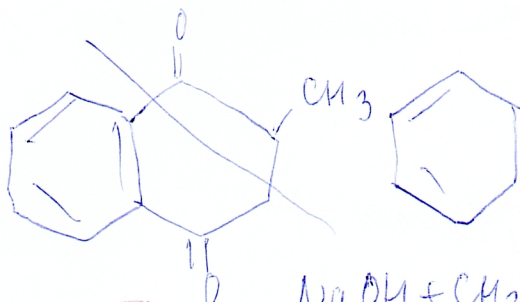
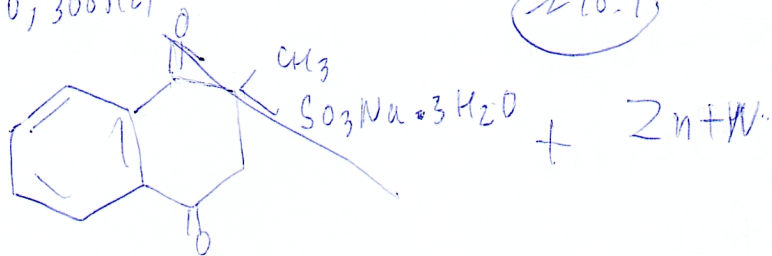
$$\omega(\text{Al(NO}_3)_3) = \frac{m(\text{Al(NO}_3)_3)}{m(\text{исх})} \cdot 100\% = \frac{4,26}{13,214} \cdot 100\% = 32,24\%$$

СЕЧЕНОВСКИЙ
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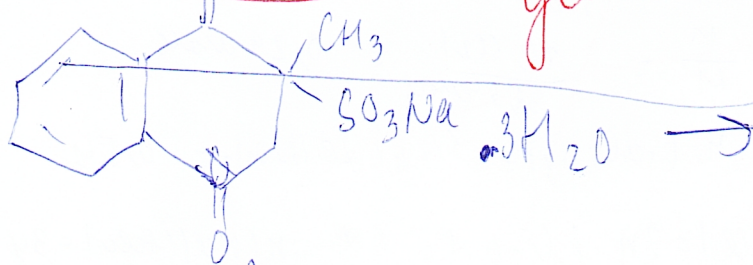


0,3065(2)

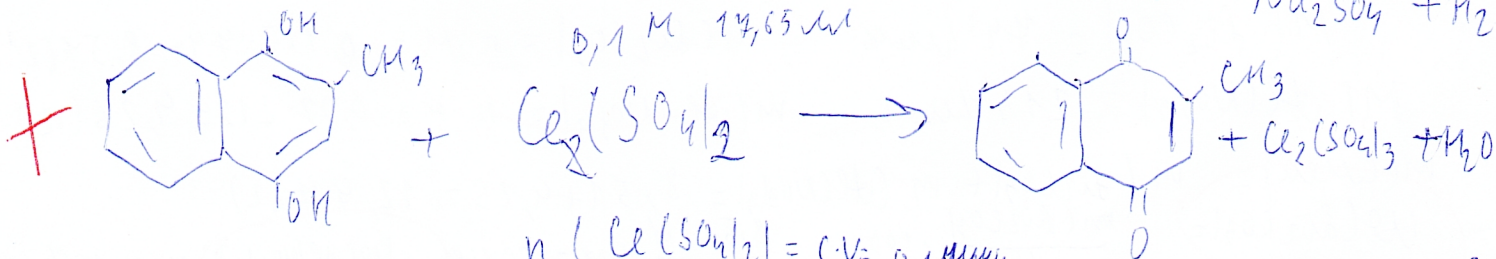
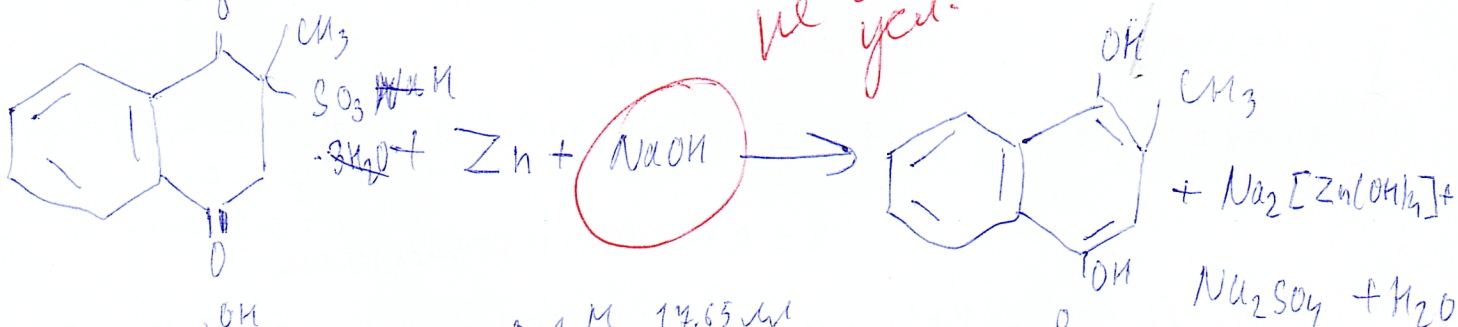
210.1



не соотв. условию.



не соотв. усл.



0,1 M 14,65 M

$n(Ce(SO_4)_2) = c \cdot V = 0,1 \text{ ммоль} \cdot 0,01465 \text{ л} = 1,465 \cdot 10^{-3} \text{ ммоль}$



СЕЧЕНОВСКИЙ
УНИВЕРСИТЕТ

10 X 0 7 4