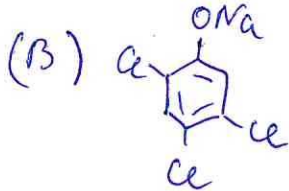
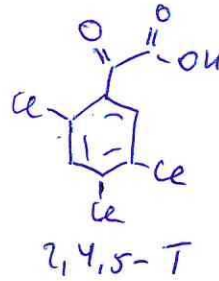
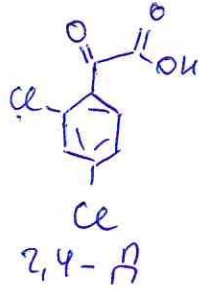


1.3. Agent Orange:



Дана:  $N_{Cl} = 6,622 \cdot 10^{23}$   
 $N_O = 3,01 \cdot 10^{23}$

$$\nu_{Cl} = \frac{N_{Cl}}{N_A} = \frac{6,622 \cdot 10^{23}}{6,022 \cdot 10^{23}} = 1,1 \text{ моль} \approx 1 \text{ моль}$$

$$\nu_O = \frac{N_O}{N_A} = \frac{3,01 \cdot 10^{23}}{6,022 \cdot 10^{23}} = 0,5 \text{ моль}$$

$$\nu_{Cl} : \nu_O = 1,1 : 0,5 = 2 : 1 \Rightarrow$$



Из кол-ва моль кислорода можно сделать вывод, что

$$\nu(Cl_2O) = \nu(O) = 0,5 \text{ моль}$$

$$m(Cl_2O) = 0,5 \cdot (35,5 \cdot 2 + 16) = 0,5 \cdot 87 = 43,5 \text{ г}$$

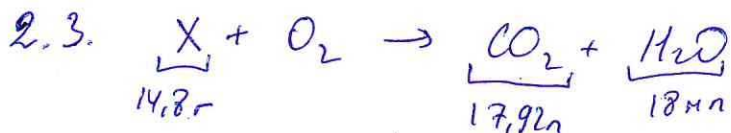
35



N	1	2	3	4	5	6	7	8	9	10
	3	4	8	2	3	1	9	7	4	2

436



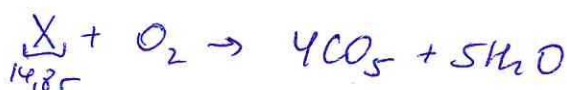


$$\nu(CO_2) = \frac{V_{CO_2}}{22,4} = \frac{17,92}{22,4} = 0,8 \text{ моль}$$

$$\rho_{H_2O} = 1 \text{ г/мл} \Rightarrow m(H_2O) = \rho \cdot V = 1 \cdot 18 = 18г \Rightarrow \nu(H_2O) = \frac{m}{M} = \frac{18}{18} = 1 \text{ моль}$$

$$\nu(CO_2) : \nu(H_2O) = 0,8 : 1 = 4 : 5$$

⇓



$$\nu(X) = \frac{\nu(CO_2)}{4} = \frac{0,8}{4} = 0,2 \text{ моль}$$

$$M(X) = \frac{m_X}{\nu_X} = \frac{14,8}{0,2} = 74 \text{ г/моль}$$

По соотношению  $CO_2$  к  $H_2O$  можно сделать вывод, что

в X есть  $\underline{C_4H_{10}} \Rightarrow 12 \cdot 4 + 10 = 58 \text{ г/моль}$

$$M(X) - 58 = 74 - 58 = 16 \text{ г/моль} \Rightarrow \text{это соответствует кислороду.}$$



+

48



$$3.3. V_{\text{изм}} = \pi r^2 h = \pi \cdot \left(\frac{1}{2}d\right)^2 \cdot h = 3,14 \cdot \left(\frac{1}{2} \cdot 5\right)^2 \cdot 25 = 490,625 \text{ см}^3$$

$$V_{\text{H}_2\text{O}} = 0,8 \cdot V_{\text{изм}} = 0,8 \cdot 490,625 = 392,5 \text{ мл}$$

$$V_{\text{NH}_3(\text{газ})} = 392,5 \cdot 25 - (25 \cdot V_{\text{H}_2\text{O}}) = 9812,5 \text{ мл} = 9,8125 \text{ л}$$

$$c_{\text{NH}_3(\text{газ})} = \frac{V_{\text{NH}_3}}{22,4} = \frac{9,8125}{22,4} = 0,438 \text{ моль}$$

$$c_{\text{NH}_3} = \frac{c_{\text{NH}_3}}{V_{\text{H}_2\text{O}}} = \frac{0,438 \text{ моль}}{0,3925 \text{ л}} = 1,116 \text{ моль/л}$$



Пусть  $c(\text{OH}^-) = x$ , тогда  $c(\text{NH}_4^+) = x$ ,  $c(\text{NH}_3) = c - x$

$$K_b = \frac{[\text{NH}_4^+] \cdot [\text{OH}^-]}{[\text{NH}_3]} = \frac{x^2}{c-x} = \frac{x^2}{1,116-x} = 10^{-4,76}$$

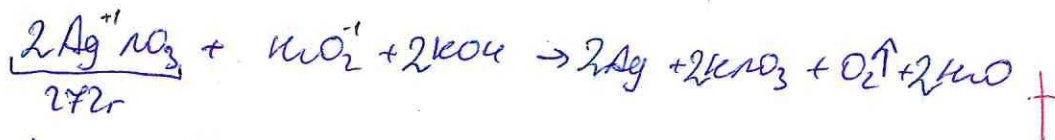
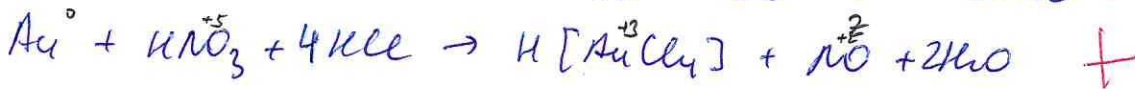
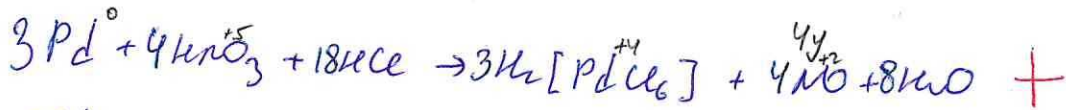
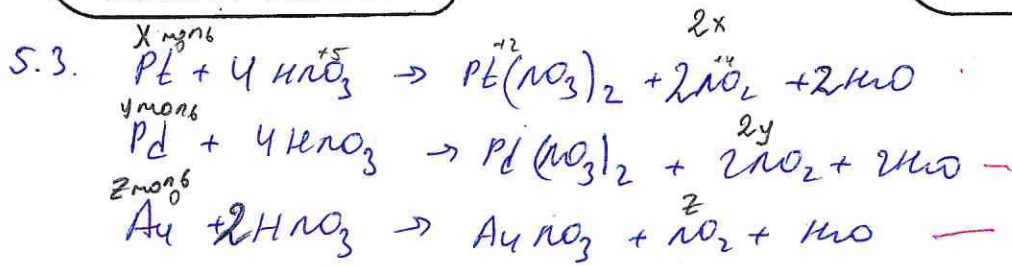
$$p\text{OH} = -\lg([\text{OH}^-]) = 2,357$$

$$p\text{H} = 14 - 2,357 = 11,643$$

$$x = 4,39 \cdot 10^{-3} = c(\text{OH}^-)$$

88





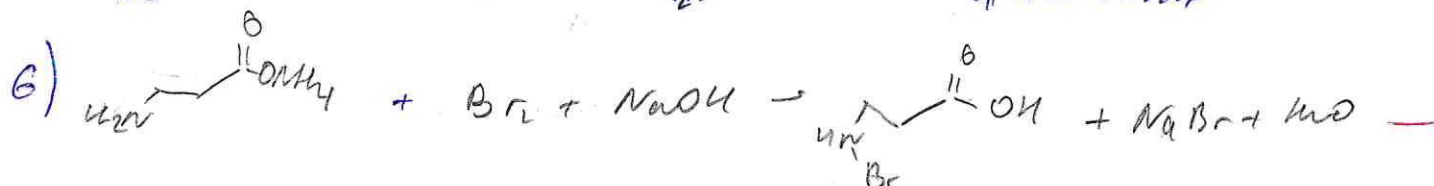
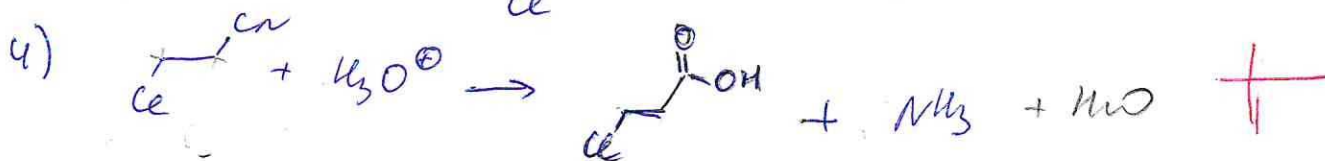
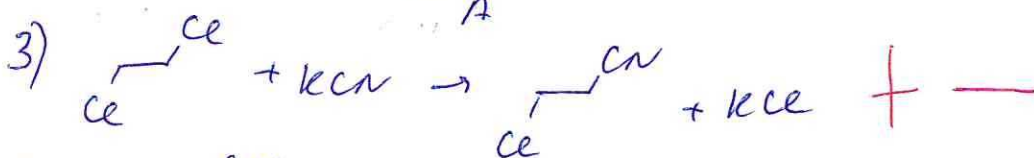
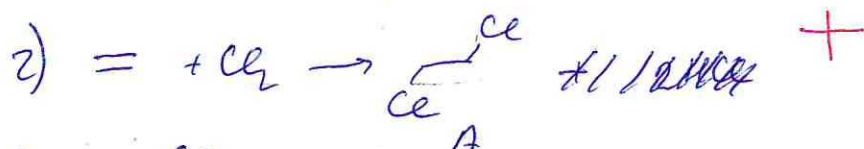
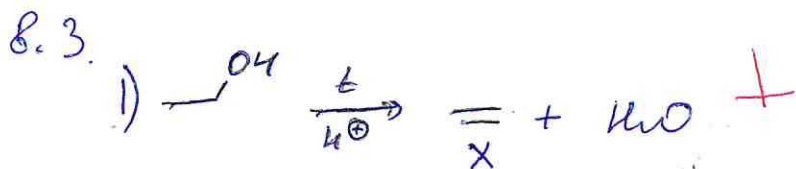
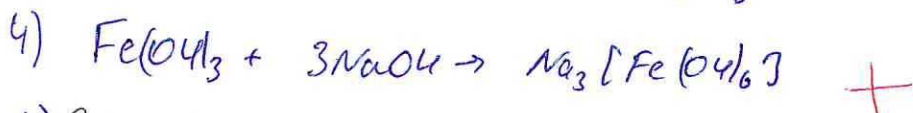
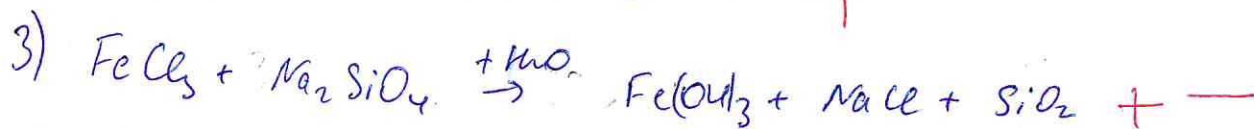
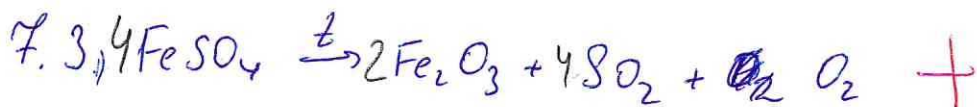
$$n_{\text{AgNO}_3} = \frac{m_{\text{AgNO}_3}}{M_{\text{AgNO}_3}} = \frac{272}{108+14+16 \cdot 3} = \frac{272}{170} = 1,6 \text{ моль}$$

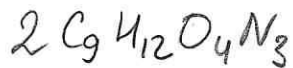
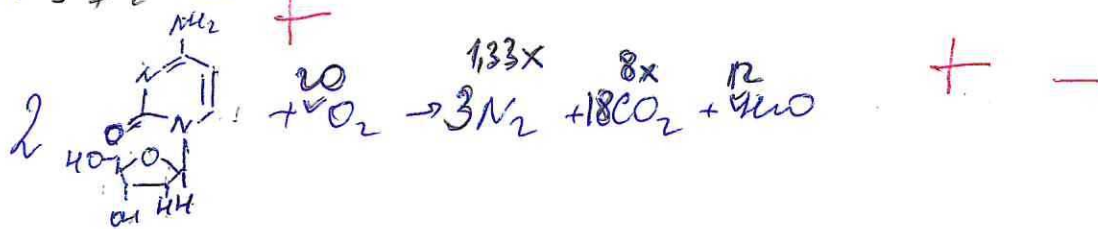
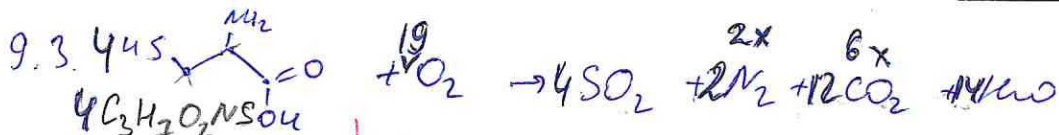
$$n(\text{O}_2) = \frac{n_{\text{AgNO}_3}}{2} = \frac{1,6}{2} = 0,8 \text{ моль}$$

$$\begin{cases}
 0,8 = 2x + 2y + z \\
 4x + 4y + z = \frac{0,8}{8,34} = 0,0959 \\
 x \cdot 195 + y \cdot 106 + z \cdot 197 = 1278,5 \cdot 4 \cdot 3,4 \cdot 10^{-8} = 5 \sqrt{547,197} \cdot 175,8 \text{ г}
 \end{cases}$$

35







Пусть  $4x$  моль азистеина, тогда  $\nu(\text{N}_2) = 2x$  моль

$\nu_{\text{N}_2}$  в азистеине  $>$   $\nu_{\text{N}_2}$  дезоксирует. в 1,5  $\Rightarrow$

$\Rightarrow \nu(\text{N}_2)_{\text{дезокс}} = \frac{2x}{1,5} = 1,33x \text{ моль}$

$\nu(\text{CO}_2)_{\text{цис}} = 6x \text{ моль} \Rightarrow m_{\text{CaCO}_3} = 6x \cdot (40 + 12 + 16 \cdot 3) = 600x - \text{цисеин}$

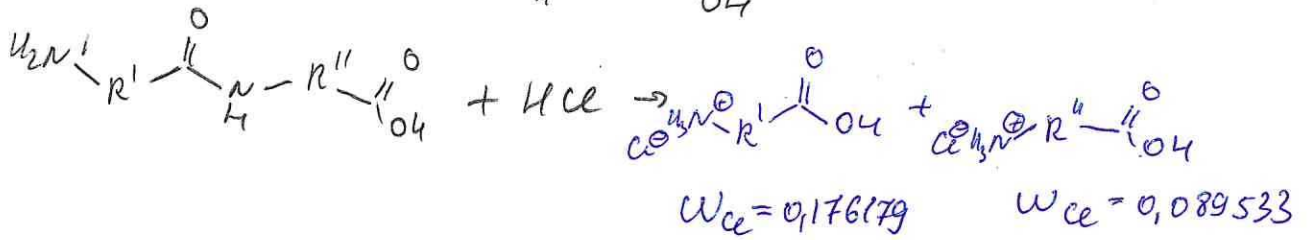
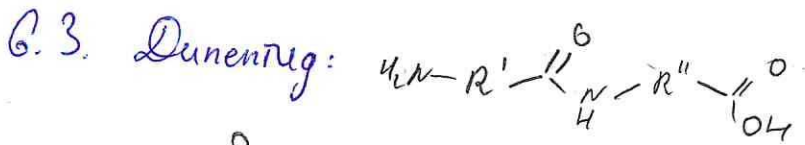
$\nu(\text{CO}_2)_{\text{дезокс}} = 8x \text{ моль} \Rightarrow m_{\text{CaCO}_3} = 8x \cdot 100 = 800x - \text{дезоксицит}$

$\frac{800x}{600x} = \frac{4}{3} \approx 1,33$

$m(\text{CaCO}_3)$ , получ. из р-ции с дезоксицит, больше в 1,33 раз

46





$$M_{\text{соед}_1} = \frac{35,5}{w_{\text{Ce}}} = \frac{35,5}{0,176179} = 201,5 \text{ г/моль}$$

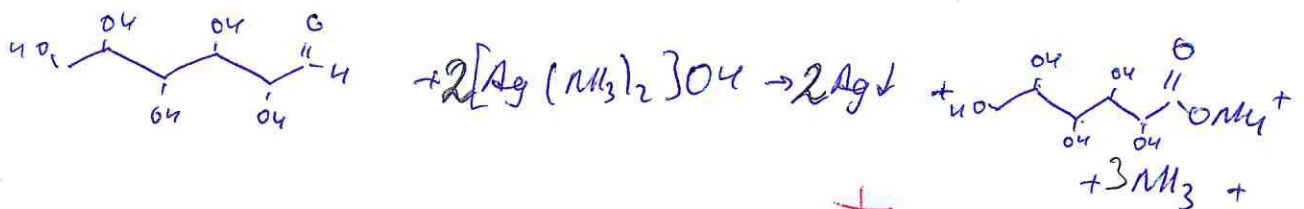
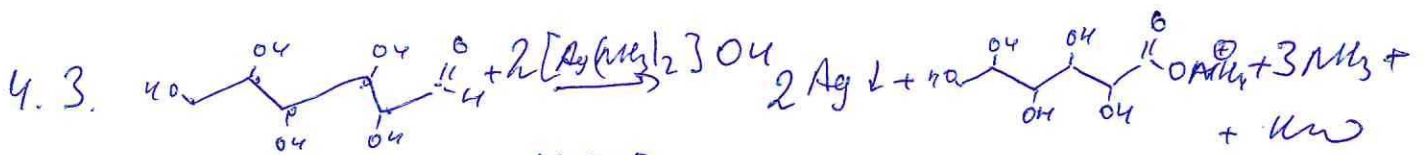
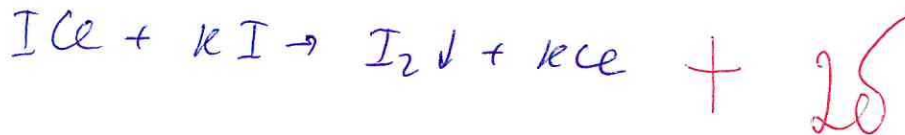
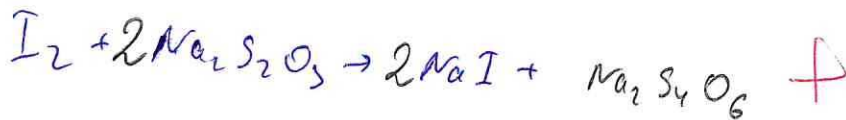
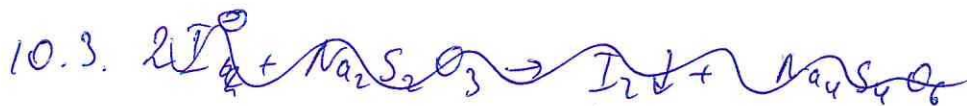
$$M_{\text{соед}_2} = \frac{35,5}{0,089533} = 396,5 \text{ г/моль} \quad +$$

$$M_{\text{соед}_1} = M_{\text{NH}_3^{\oplus}} + M_{\text{Ce}} + M_{\text{R}' } + M_{\text{COOH}} = 17 + 35,5 + \text{R}' + 45 = 201,5$$

$$\text{R}' = 104 \text{ г/моль}$$

16

$$M_{\text{соед}_2} = 17 + 35,5 + \text{R}'' + 45 = 396,5 \Rightarrow \text{R}'' = 299 \text{ г/моль}$$



$m(Ag_2O) = 0,3 \cdot 17 = 5,1г$

$\nu(Ag_2O) = \frac{5,1}{108 \cdot 2 + 16} = 0,022 \text{ моль} \Rightarrow \nu(Ag) = 0,044 \text{ моль}$

25

