

# **Часть 1**

**Олимпиада: Химия 9 класс (1 часть)**

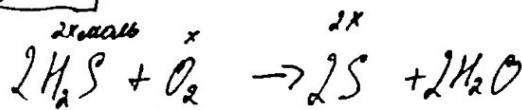
**Шифр: 21300513**

**ID профиля: 874888**

**Вариант 1**

Чистота.

Задача 2



$$\frac{\text{Масса}}{\text{Масса}} = \frac{\text{Масса}}{\text{Масса}} \quad \text{Масса} = 29 \text{ грамм.}$$

$$\text{Масса} = 1,134 \cdot 29 = 33 \text{ грамм.}$$

$$\frac{(2x+2y) \cdot 34 + (x+3y) \cdot 32}{2x+2y+x+3y} = 33$$

$$\frac{560}{2} \cdot 8x + \frac{146}{2} \cdot 2y = 192,6$$

$$560x + 246y = 192,6$$

$$\frac{68x + 68y + 32x + 96y}{3x+5y} = 33$$

$$\frac{100x + 164y}{3x+5y} = 33$$

$$\begin{cases} 560x + 246y = 192,6 \text{ (II)} \\ \frac{100x + 164y}{3x+5y} = \frac{33}{1} \text{ (I)} \end{cases}$$

$$(I) \quad 100x + 164y = 99x + 165y$$

$$x = y$$

$$(II) \quad 560x + 246y = 192,6$$

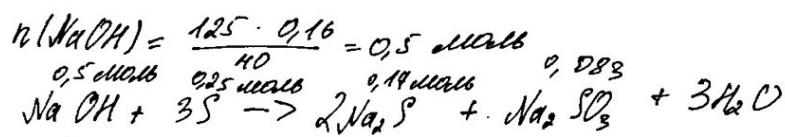
$$800x = 192,6$$

$$x \approx 0,24 \text{ мол.}$$

$$y \approx 0,24 \text{ мол.}$$

$$V(\text{H}_2\text{S}) = (2 \cdot 0,24 + 2 \cdot 0,24) \cdot 22,4 = 21,5 \text{ л.}$$

$$V(\text{O}_2) = (4 \cdot 0,24) \cdot 22,4 = 81,5 \text{ л.}$$



$$\vartheta(\text{Na}_2\text{S}) = \frac{0,14 \cdot 78}{125 + 0,25 \cdot 32} = \frac{13,26}{133} = 0,1 \cdot 100\% = 10\%$$

$$\vartheta(\text{Na}_2\text{SO}_3) = \frac{0,083 \cdot 126}{125 + 0,25 \cdot 32} \approx 0,08 \cdot 100\% = 80\%$$

Ответ: 21,5 л - H<sub>2</sub>S; 21,5 л - O<sub>2</sub>; θ(Na<sub>2</sub>S) = 10%; θ(Na<sub>2</sub>SO<sub>3</sub>) = 80%.

Zadatak 3

Umetanje

(2)

0,427 mol/L



$$m(\text{NaCl}) = 500 \cdot 0,05 = 25 \text{ g}$$

$$n(\text{NaCl}) = \frac{25}{58,5} = 0,427 \text{ mol/L}$$

$$V_i(\text{Cl}_2) = 13,02 - 0,2135 \cdot 22,4 = 13,02 - 4,9824 \approx 8,3 \text{ L}$$

$$n_i(\text{Cl}_2) = \frac{8,3}{22,4} = 0,37 \text{ mol/L}$$

$$M(\text{Mle}) = \frac{23,66}{0,37} \approx 64,2 \text{ mol/L} - (\text{lu})$$

$$\varpi(\text{CaCl}_2) = \frac{0,37 \cdot 135}{5000} = 0,1 \cdot 100\% = 10\%$$

$$\varpi(\text{NaOH}) = \frac{0,427 \cdot 54}{(500 - 0,37 + 0,2135) \cdot 71} = \frac{24,839}{458,153} \cdot 100\% = 5,3\%$$

$$V(\text{H}_2) = 0,2135 \cdot 22,4 = 4,98 \text{ L}$$

$$Q = I \cdot T$$

$$m = \frac{1 \cdot M}{F} \cdot I \cdot T$$

$$23,62 = \frac{1 \cdot 64}{965000 \cdot 2} \cdot 5T = 4 \text{ mAh}$$

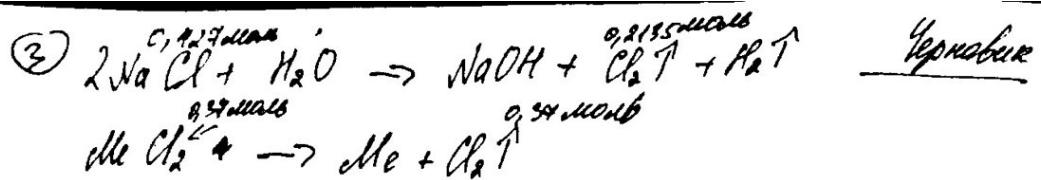
Orbjet: 1) lu - mAh

$$2) \varpi(\text{CaCl}_2) = 10\%$$

$$\varpi(\text{NaOH}) = 5,3\%$$

$$V(\text{H}_2) = 4,98 \text{ L}$$

$$T = 4 \text{ mAh}$$

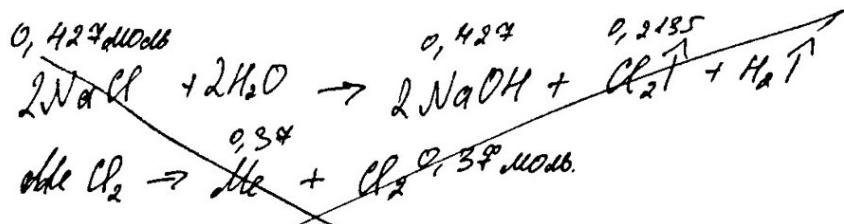


$$m(\text{NaCl}) = 500 \cdot 0,05 = 25 \text{ g.}$$

$$n(\text{NaCl}) = \frac{0,05}{58,5} = 0,427 \text{ mol.}$$

$$V_2(\text{Cl}_2) = 13,07 - 0,2135 \cdot 22,4 = 13,07 - 4,9824 \approx 8,0 \text{ л.}$$

$$n_2(\text{Cl}_2) = \frac{0,37}{22,4} = 0,37 \text{ mol.}$$



~~$$m(\text{NaCl}) = \frac{500 \cdot 0,05}{58,5} = 0,427 \text{ mol.}$$~~

~~$$V_2(\text{Cl}_2) =$$~~

$$m(\text{He}) = \frac{23,66}{0,37} \approx 64 \text{ g/mol.}$$

(iii)

$$\omega(\text{Cl/Cl}_2) = \frac{0,37 \cdot 135}{5000} = 0,1 \cdot 100\% = 10\%.$$

$$\omega(\text{NaOH}) = \frac{0,427 \cdot 54}{500 - (0,37 + 0,2135) \cdot 91} = \frac{24,339}{458,153} \cdot 100\% = 5,3\%$$

$$V(\text{H}_2) = 0,2135 \cdot 22,4 = 4,98 \text{ л.}$$

$$\mathcal{C} = I \cdot T$$

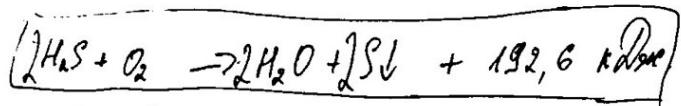
$$m = \frac{1 \cdot M}{F} = I \cdot T$$

$$23,62 = \frac{1 \cdot 64}{800000 \cdot 2} \Rightarrow 5T = 4 \text{ мака}$$

Решение.

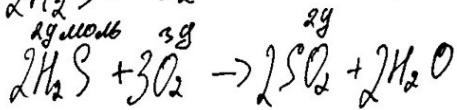
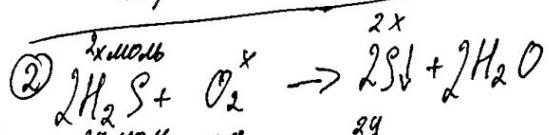


$x - \text{моль}$



$$\omega(\text{H}_2\text{S}) = 5\% \cdot x$$

$\text{CH}(x)$



$$\text{Масса} = 1,134 \cdot 29 = 33,9 \text{ г моль.}$$

$$\frac{560}{2} \cdot 8x + \frac{246}{2} \cdot 2y = 192,6$$

$$\left\{ \begin{array}{l} 560x + 246y = 192,6 \quad (\text{II}) \\ 100x + 164y = 33 \quad (\text{I}) \end{array} \right.$$

$$\frac{100x + 164y}{3x + 5y} = \frac{33}{1} \quad (\text{I})$$

$$\frac{(2x + 2y) \cdot 34 + (x + 3y) \cdot 32}{3x + 5y} = 33$$

$$(\text{I}) 100x + 164y = 99x + 165y$$

$$x = y.$$

$$\frac{68x + 68y + 32x + 96y}{3x + 5y} = 33$$

$$(\text{II}) 560x + 246y = 192,6.$$

$$800x = 192,6$$

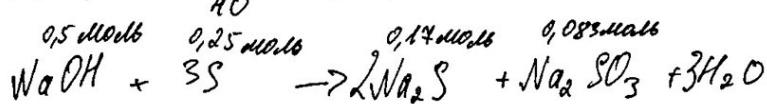
$$\begin{aligned} x &\approx 0,24 \text{ моль} \\ y &\approx 0,24 \text{ моль.} \end{aligned}$$

$$\frac{100x + 164y}{3x + 5y} = 33$$

$$V(\text{H}_2\text{S}) = (2 \cdot 0,24 + 0,24) \cdot 22,4 = 21,5 \text{ л.}$$

$$V(\text{O}_2) = (4 \cdot 0,24) \cdot 22,4 = 21,5 \text{ л.}$$

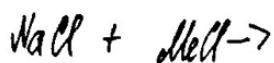
$$n(\text{NaOH}) = \frac{125 \cdot 0,16}{40} = 0,5 \text{ моль.}$$



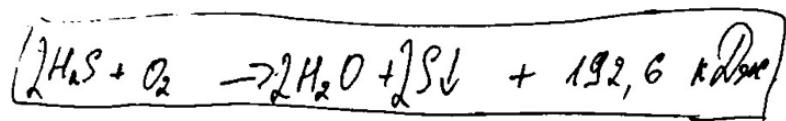
$$\omega(\text{Na}_2\text{S}) = \frac{0,14 \cdot 98}{125 + 0,25 \cdot 32} - \frac{13,26}{133} = 0,1 \cdot 100\% = 10\%$$

$$\omega(\text{Na}_2\text{SO}_3) = \frac{0,083 \cdot 126}{125 + 0,25 \cdot 32} \approx 0,08 \cdot 100\% = 8\%.$$

Черновик.

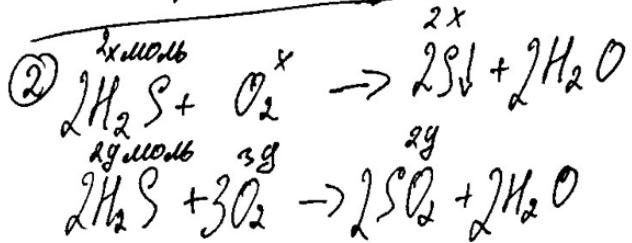


$x - \text{моль}$



$$\omega(\text{CP}) = 5\% x$$

$m(x)$



$$m_{\text{анон}} = 1,134 \cdot 29 = 33,9 \text{ моль.}$$

$$\frac{(2x+2y) \cdot 34 + (x+3y) \cdot 32}{2x+2y+x+3y} = 33$$

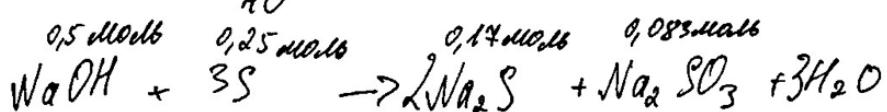
$$\frac{68x+68y+32x+96y}{3x+5y} = 33$$

$$\frac{100x+164y}{3x+5y} = 33$$

$$V(\text{H}_2\text{S}) = (2 \cdot 0,24 + 0,24) \cdot 22,4 = 21,5 \text{ л.}$$

$$V(\text{O}_2) = (4 \cdot 0,24) \cdot 22,4 = 21,5 \text{ л.}$$

$$n(\text{NaOH}) = \frac{125 \cdot 0,16}{40} = 0,5 \text{ моль.}$$



$$\omega(\text{Na}_2\text{S}) = \frac{0,14 \cdot 78}{125 + 0,25 \cdot 32} = \frac{13,26}{133} = 0,1 \cdot 100\% = 10\%$$

$$\omega(\text{Na}_2\text{SO}_3) = \frac{0,083 \cdot 126}{125 + 0,25 \cdot 32} \approx 0,08 \cdot 100\% = 8\%.$$

$$\begin{aligned} & \frac{560}{2} \cdot 8x + \frac{246}{2} \cdot 2y = 192,6 \\ & \left\{ \begin{array}{l} 560x + 246y = 192,6 \quad (\text{II}) \\ \frac{100x + 164y}{3x+5y} = \frac{33}{1} \quad (\text{I}) \end{array} \right. \end{aligned}$$

$$(\text{I}) 100x + 164y = 99x + 165y$$

$$x = y.$$

$$(\text{II}) 560x + 246y = 192,6.$$

$$800x = 192,6$$

$$\begin{aligned} x &\approx 0,24 \text{ моль} \\ y &\approx 0,24 \text{ моль.} \end{aligned}$$

# Часть 2

Олимпиада: **Химия 9 класс (2 часть)**

Шифр: **21300513**

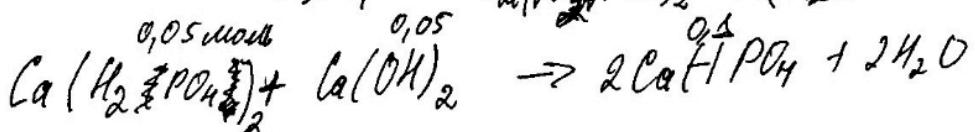
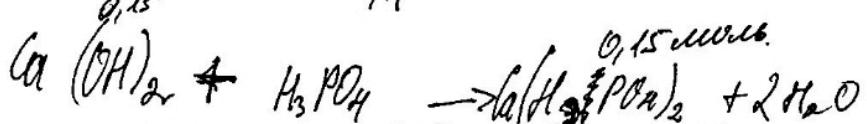
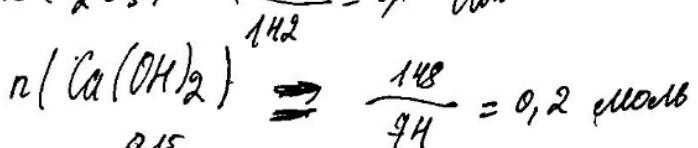
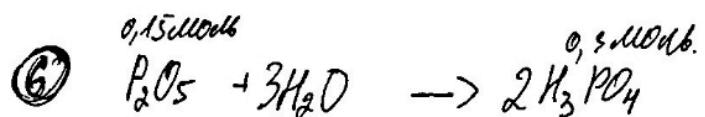
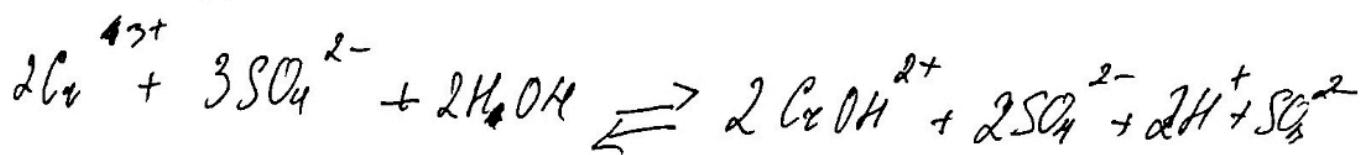
ID профиля: **874888**

Вариант 1

Черновик

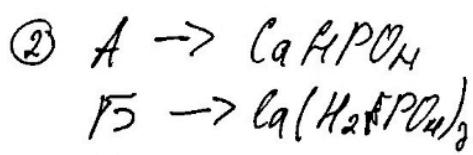
③ Осадка не содержит уг-за т.к. это б. избыточное KOH образует комплекс с Cr.

④ Уг-за индикация



Потеря массы:

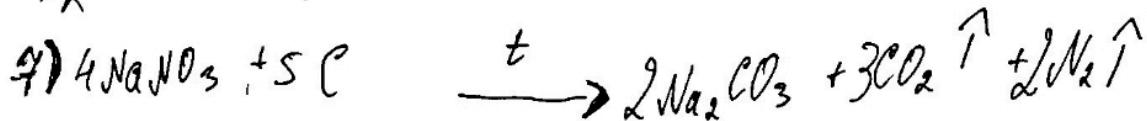
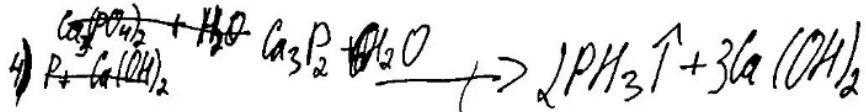
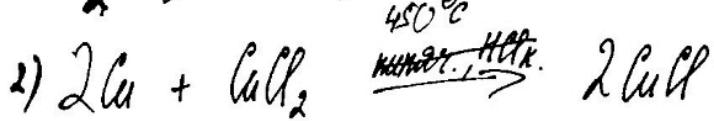
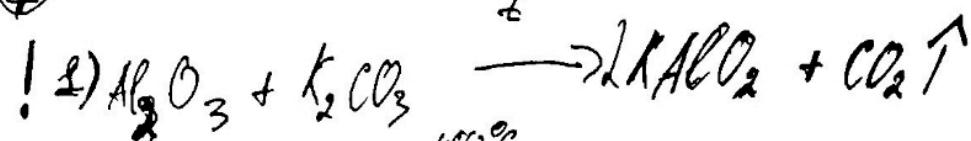
$$\frac{272 - 254}{292} \cdot 100\% = 6,6\%$$



③  $\Omega = \frac{(0,15 - 0,05) \cdot 274}{800 + 25,3 + 14,8 - 0,8} = \frac{23,4}{222,3} = \frac{100\%}{10,5\%}$

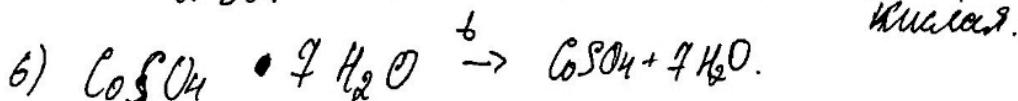
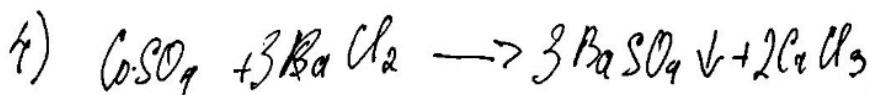
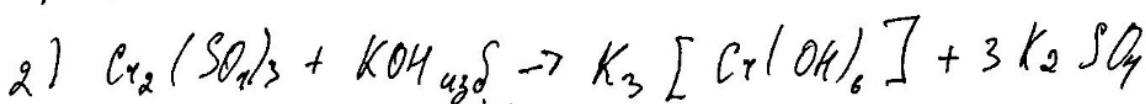
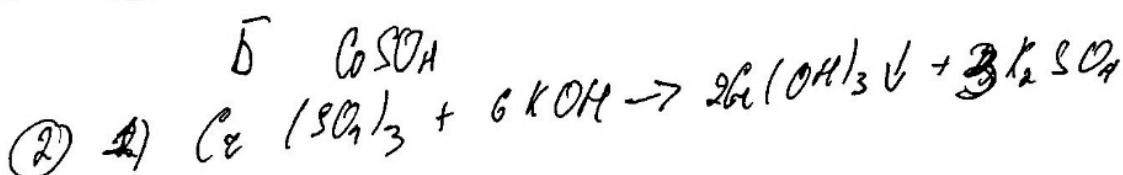
Горючие

④



⑤

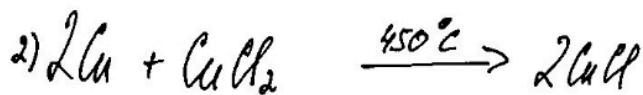
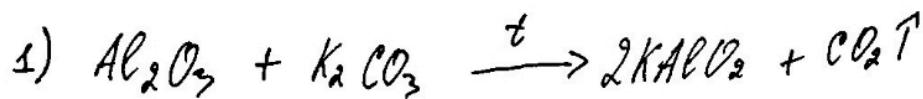
$$m(\text{H}_2\text{O}_{\text{вр.}}) = 200\%$$



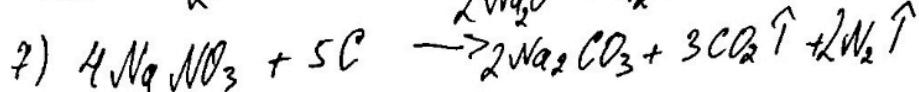
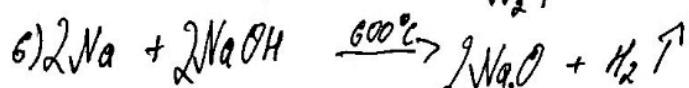
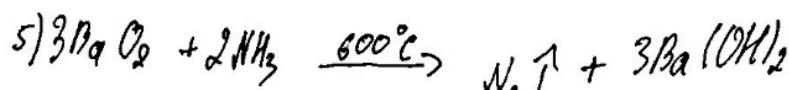
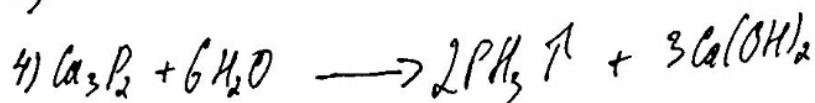
1

Учебник.

Задачи



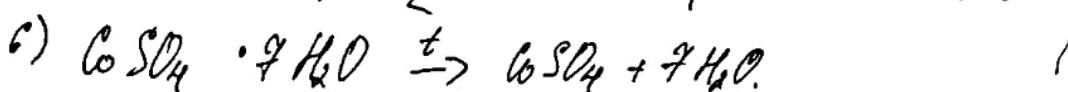
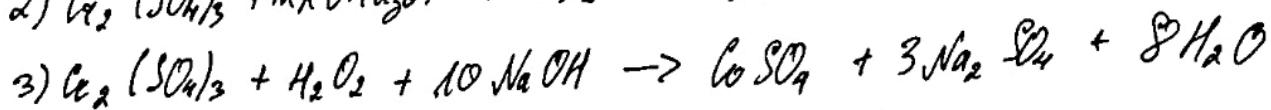
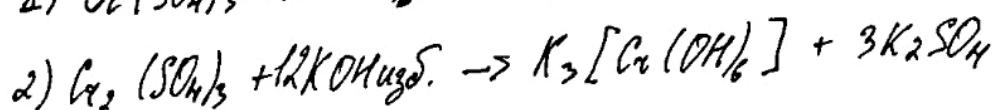
3)



(2)

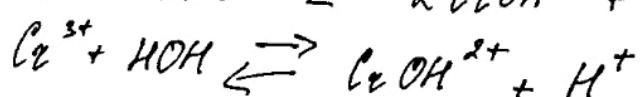
Чистовик

Задача 5



③ В реакции 2 осадок не будет из-за того, что в избытке KOH образуется комплекс с Cr. (амфотерность хрома)

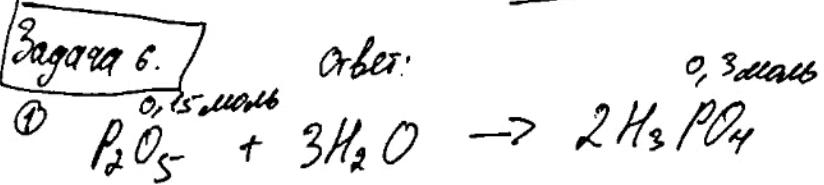
④ Раствор E имеет кислую реакцию среды из-за гидролиза.



Microbius

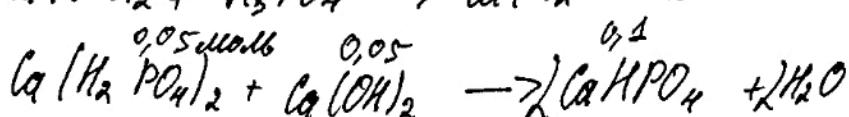
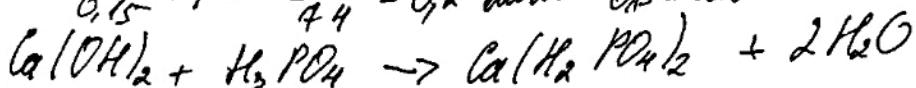
Задача 6.

Orber:



$$n(P_2O_5) = \frac{2 \cdot 1,5}{142} = 0,15 \text{ моль}$$

$$n(Ca(OH)_2) = \frac{142}{44} = 0,2 \text{ моль} \quad 0,15 \text{ моль}$$



Проверка массы:

$$\frac{272 - 254}{272} \cdot 100\% = 6,6\%$$

