



19-41-18-21

(47.2)



МОСКОВСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ имени М.В.ЛОМОНОСОВА

Вариант 1

Место проведения Москва
город

ПИСЬМЕННАЯ РАБОТА

Олимпиада школьников Ломоносова
наименование олимпиады

по Химии
профиль олимпиады

Бунин Иван Андреевич
фамилия, имя, отчество участника (в родительном падеже)

Дата

«2» марта 2025 года

Подпись участника

Бунин

Чистовик.

n1

простейшая формула - CH_2 $\text{X} - \text{SOCH}_2$ нет расчёта - 0 8

84

n2

$$1) \begin{cases} Q_{\text{обр}}(\text{CO}_2) + 2Q_{\text{обр}}(\text{H}_2\text{O}) - Q_{\text{обр}}(\text{CH}_4) = 890 \\ Q_{\text{обр}}(\text{CH}_4) + 2Q_{\text{обр}}(\text{H}_2\text{O}) - Q_{\text{обр}}(\text{CO}_2) = 253 \end{cases}$$

⊕ - составим уравнения системы

$$Q_{\text{обр}}(\text{H}_2\text{O}) = 1143$$

$$Q_{\text{обр}}(\text{H}_2\text{O}) = 285,75 \text{ кДж/моль} + 8$$

2)



$$n(\text{H}_2\text{O}) = 1000/18 = 55,55 \text{ моль} +$$

$$Q = 55,55 \cdot 285,75 = 15873,4125 \text{ кДж} +$$

$$n(\text{CH}_4) = Q/890 = 17,835 \text{ моль}$$

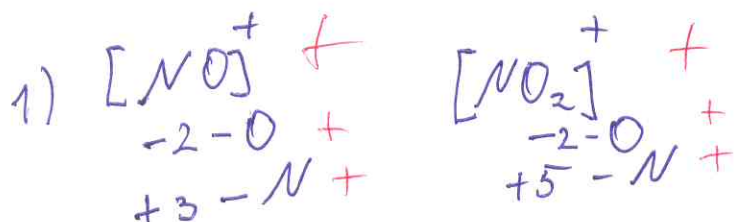
$$n(\text{CH}_4) = n \cdot V_m = 400 \text{ л} + 6$$

$$\text{Ответ: } 285,75; 400 \text{ л}$$

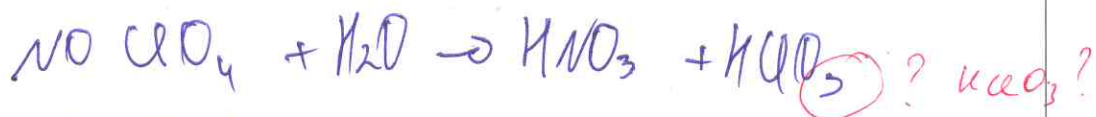
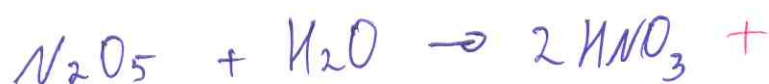
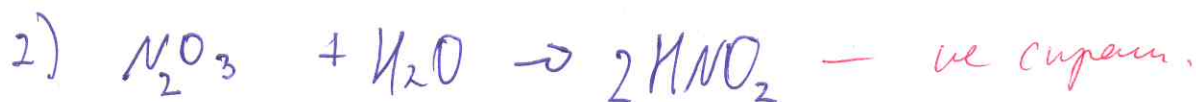
⊕

Числовик.

N3



⊕



N4



$$164 - 8 = 156^\circ \text{C} \cdot + 25$$



$$29,8 - x = 1,64x - 8$$

$$X = 14,32\% \cdot + \text{сбаланс.}$$

$$\text{Ga} = 85,68\% \quad X(\text{Ga}) = 85,68\%$$

$$t_{\text{me}} = 15,48^\circ \text{C} \cdot +$$

⊕



$$t_{\text{me}} = 37,826 \cdot 1,64 - 8 = 54^\circ \text{C} \cdot +$$

расчет
есть
в
первом

№ 5

Уматович.

$$m = \frac{t \cdot M \cdot I}{N_a \cdot z \cdot q_e} +$$

$$N_a = \frac{t \cdot M \cdot I}{m \cdot z \cdot q_e} +$$

 $z=2$ отсюда что следует?

$$N_a = 2525 \cdot 58,69 \cdot 1,234$$

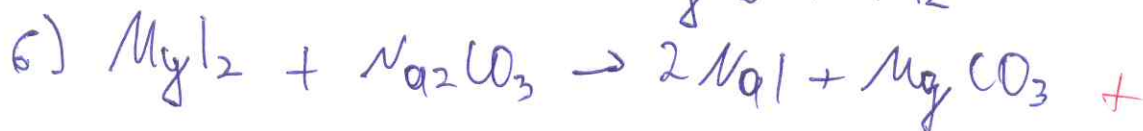
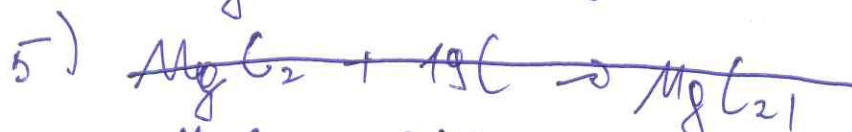
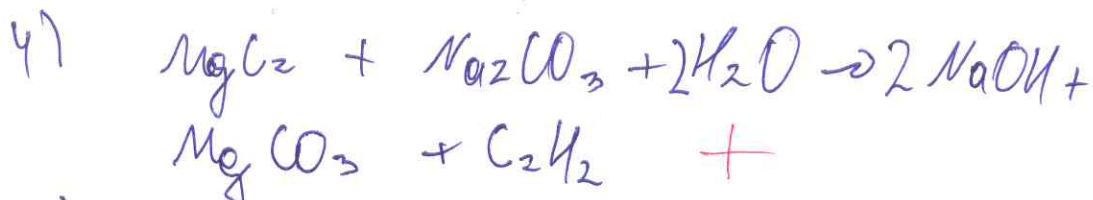
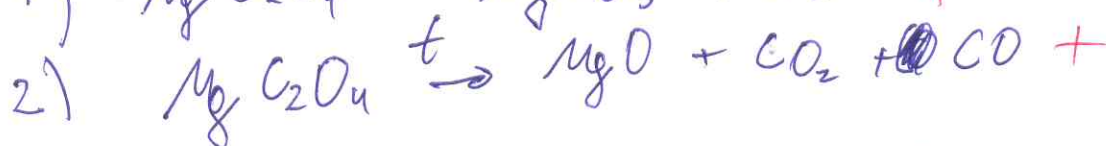
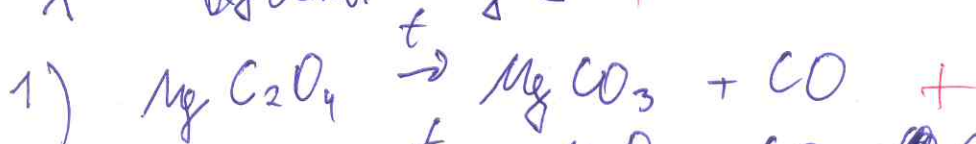
$$\frac{0,9453 \cdot 2 \cdot 1,602 \cdot 10^{-19}}{23} = 6,038 \cdot 10^{-23} \text{ моль}^{-1}$$

+

23

№ 6

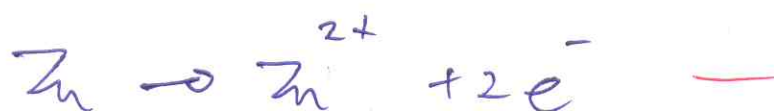
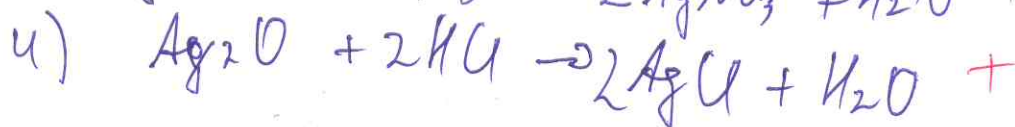
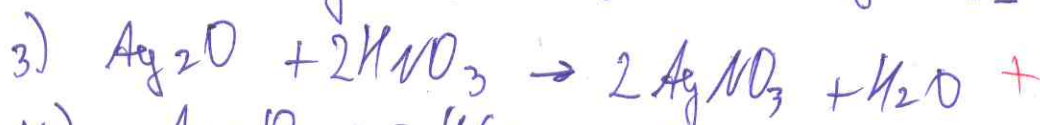
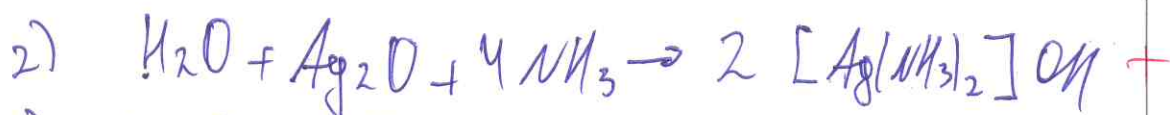
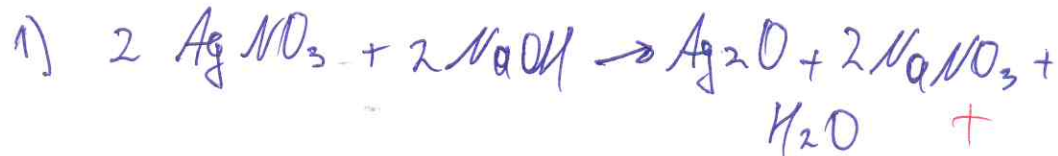
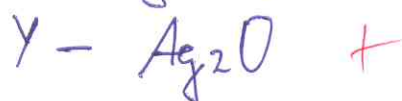
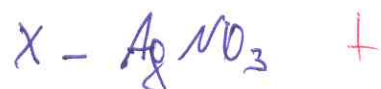
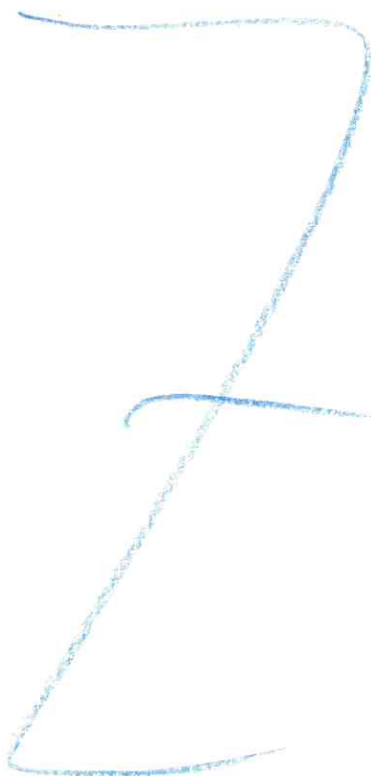
$$M(X) = \frac{24}{8,7} \cdot 100 \approx 275$$



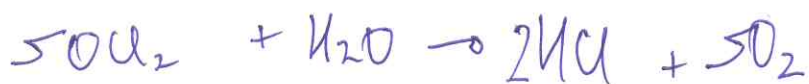
+

Чистовик.

№ 7

OH⁻

Черновик



$$890 = Q_0(\text{CO}_2) + 2Q_0(\text{H}_2\text{O}) - Q_0(\text{CH}_4)$$

$$253 = Q_0(\text{CH}_4) + 2Q_0(\text{H}_2\text{O}) - Q_0(\text{CO}_2)$$

$$Q_0(\text{H}_2\text{O}) = \frac{253 - Q_0(\text{CH}_4) + Q_0(\text{CO}_2)}{2}$$

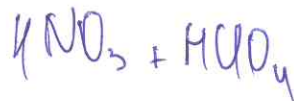
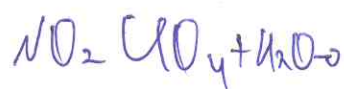
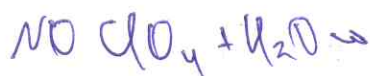
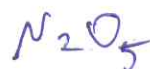
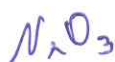
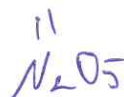
$$890 + 253 = 4 Q_0(\text{H}_2\text{O})$$

$$Q_0(\text{H}_2\text{O}) = 285,75 \text{ кДж/моль}$$

$$1,64x - 8 = 29,8 - x$$



$$x_{\min} = 14,318\% \quad [\text{NO}_2][\text{NO}_3]$$



$$x_{\min} = 29,8 - x$$

$$1,64x + x = 37,8$$

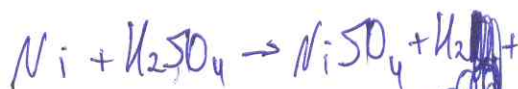
Черновик.

~~изучить + моль м, + гд~~

~~$n(l_n) = 0,1432$~~

~~2002 - m mly 1,234.58,69~~
~~1002 ln, 1002 Ga~~

$tMl = mNa2e$
 $n(l_n) = 0,87$
 $n(Ga) = 1,43$



$\frac{1}{t} = q$
 $\frac{M_{*}}{t} = 4$

$x = 37,826 \%$

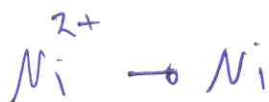
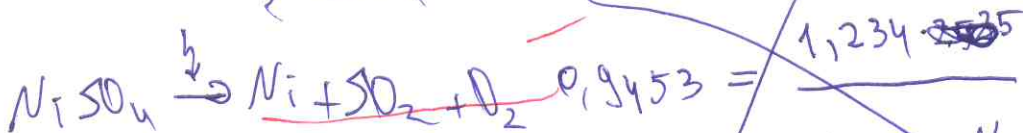
$1,64 \cdot 37,826 - 8 = 54 \Delta m =$



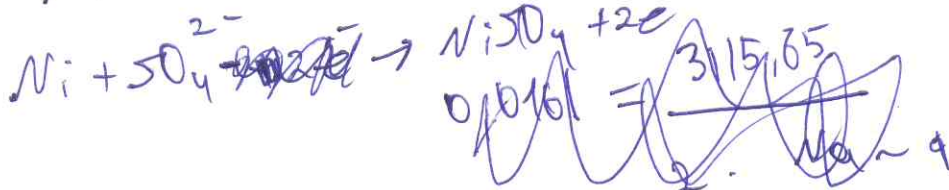
$h = \frac{1}{F} \cdot \frac{M}{12}$

~~$0,8453 = \frac{2525 \cdot 58,69}{Na \cdot q \cdot 4}$~~

$F = \frac{Na}{q}$
 $0,8453 = \frac{M}{Na \cdot q \cdot 2t}$

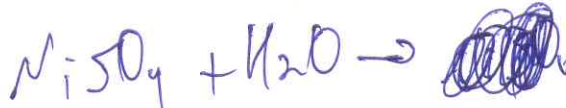


~~$1,234 \cdot 2525$~~
 ~~$2525 \cdot 2 \cdot 58,69 \cdot \frac{Na}{1,602 \cdot 10^{-19}}$~~

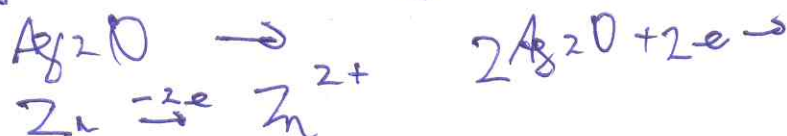
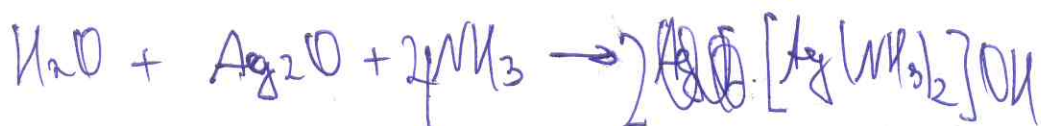
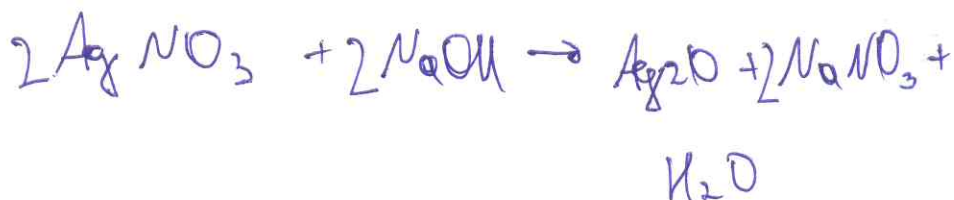
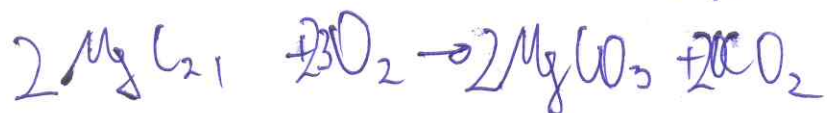
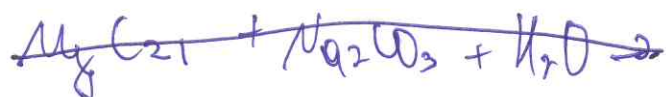
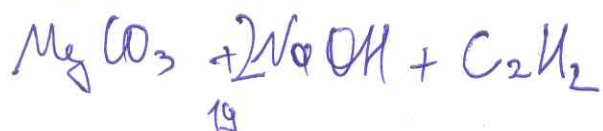
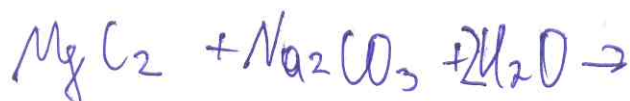


$4,887 \cdot 10^{-4} K_1 - d$

$0,8453 = \frac{2525 \cdot 58,69}{Na \cdot q \cdot 2t}$



Черновик.



Черновик.

