

Часть 1

Олимпиада: **Химия 10 класс (1 часть)**

Шифр: **21300304**

ID профиля: **867266**

Вариант 1

Условие.

①

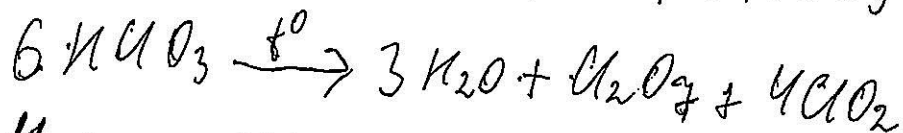
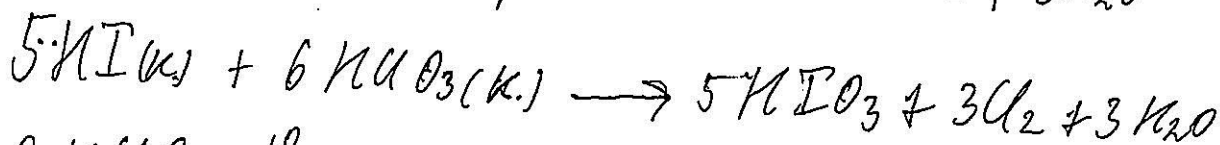
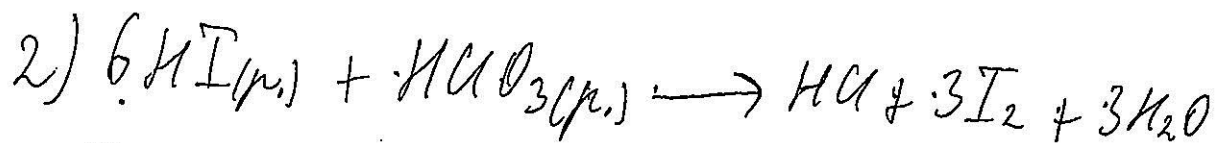
Задача 2.

1) А - HI; Б - HClO₃; В - HCl; Г - I₂; Ж - Cl₂;

$$M(I_2) = M(Cl_2) \cdot 3,578 = 71 \cdot 3,578 = 254.$$

У "I₂" и "Cl₂" одинаковое кол-во е на
внешнем энергетическом уровне.

HI - три н.у. ~~раз~~ раз с резким запахом,
хорошо растворим в воде; HClO₃ - существует
только в водном растворе. Оба в-ва разлагаются,
в водном растворе ведут себя как сильные окислители.



$$H_2O - \omega(O_2) = 88,9\%$$

$$Cl_2O_7 - \omega(O) = 61,2\%$$

$$ClO_2 - \omega(O) = 47,4\%$$

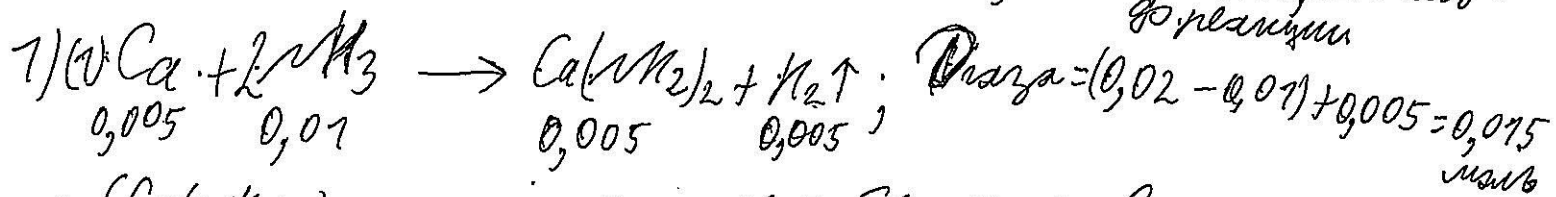
Условие.

Задача 3.

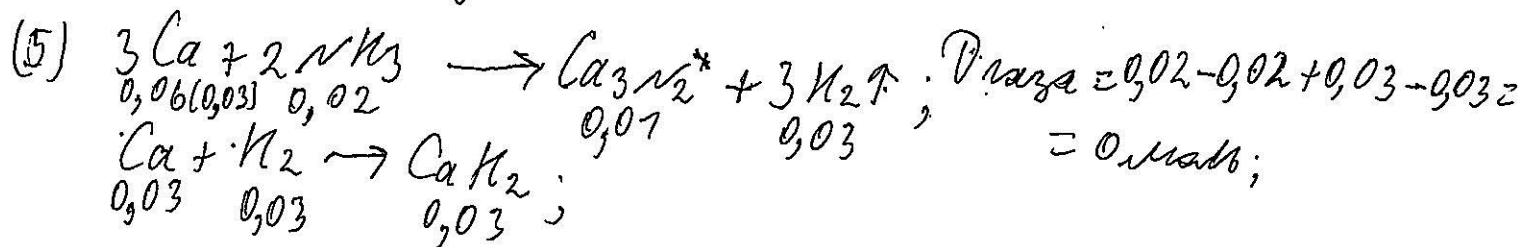
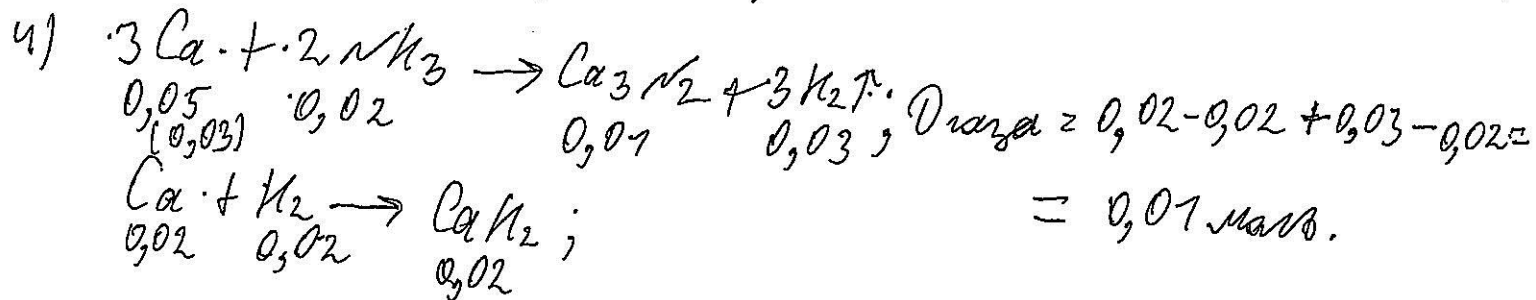
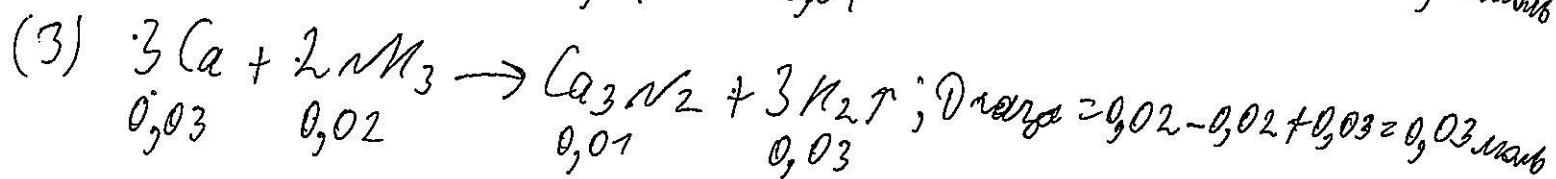
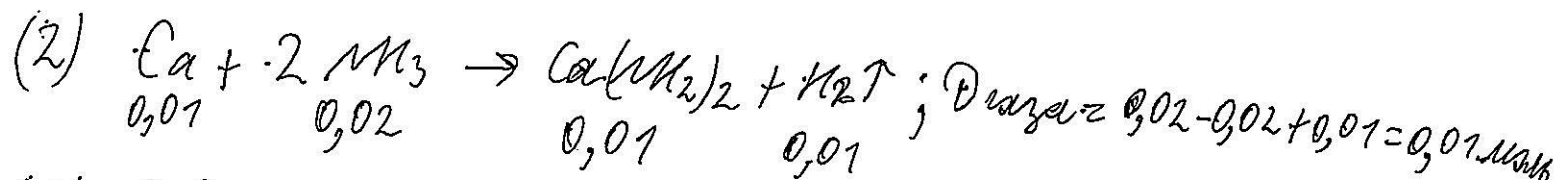
(2)

№ опыта	1	2	3	4	5
$\nu(\text{Ca}), \text{моль}$	0,005	0,01	0,03	0,05	0,06
$\nu(\text{NH}_3)_{\text{исх.}} / \nu(\text{NH}_3)_{\text{пл.}}, \text{моль}$	0,015	0,01	0,03	0,01	0

По условию „Ca“ пропущен вес; $\nu(\text{NH}_3) \geq 0,02 \text{ моль}$ - по плану



$m(\text{Ca}(\text{NH}_2)_2) = 0,36 \text{ г}$, что соответствует условию



2) (2) $m(\text{Ca}(\text{NH}_2)_2) = 72 \text{ г/моль} \cdot 0,01 \text{ моль} = 0,72 \text{ г}$.

(3) $m(\text{Ca}_3\text{N}_2) = 748 \text{ г}$;

(4) $m(\text{Ca}_3\text{N}_2) = 7,48 \text{ г}$; $m(\text{CaH}_2) = 0,84 \text{ г}$

(5) $m(\text{Ca}_3\text{N}_2) = 7,48 \text{ г}$; $m(\text{CaH}_2) = 7,26 \text{ г}$

Числовик
Задача 1

③

4) Нет; не изменился, т.к. угловые электроны
доставляют энергию,

непробук.

m
 (PM)

$$\frac{q}{F}$$

~~непробук.~~

$$\frac{I + q}{F \cdot PM}$$

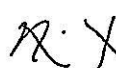
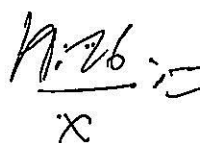
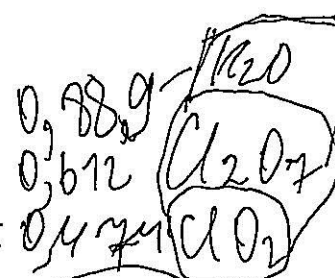
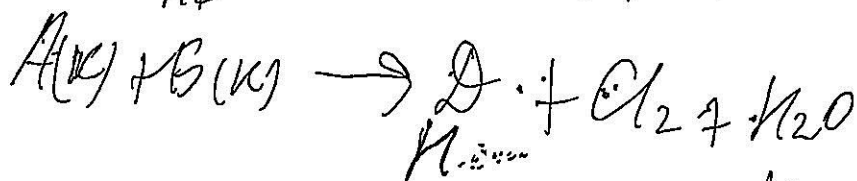
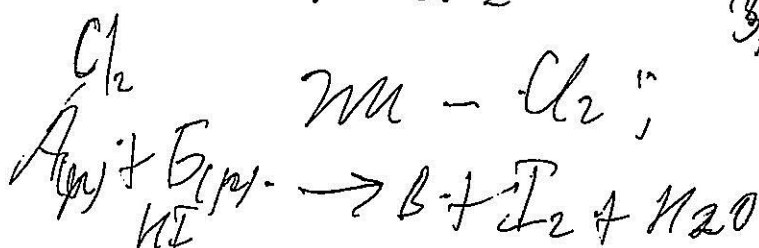
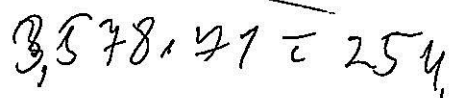
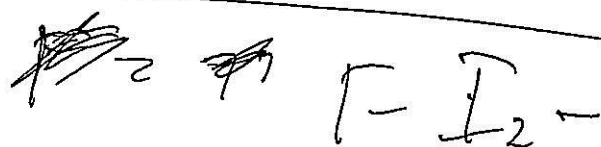
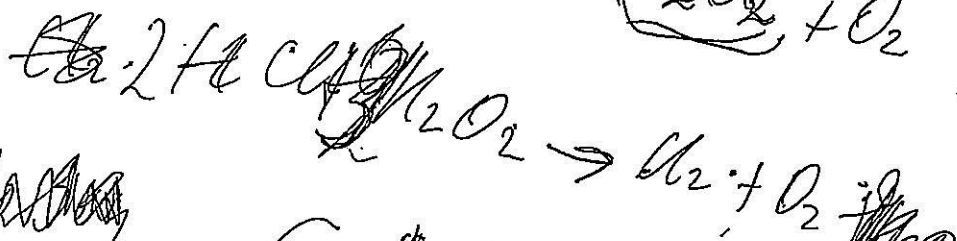
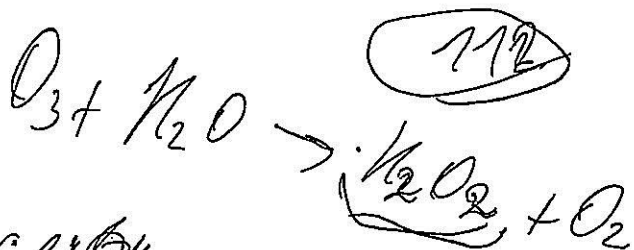
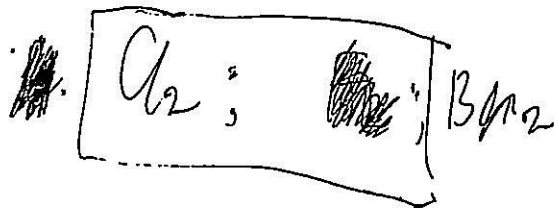
$$\frac{I + 2}{F \cdot PM} \cdot 2$$

$$Q =$$

$$4A; f = 24 \text{ ГГц.}$$

~~непробук.~~

А - архив	черновик.	1/1	1/1
Б - архив	архивная	1/1	1/1
В - архив	определен.	1/1	1/1
РКН:МЗ			



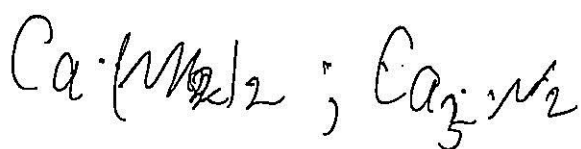
~~2594~~ 205
~~384~~ 80
~~384~~

переносим.

23.

$$V = V_m \cdot D$$

номер	1	2	3	4	5
$m(Ca), \text{г}$	0,2	0,4	0,6	0,8	1,0
$n(Ca), \text{моль}$	0,005	0,01	0,03	0,05	0,06
$V_{H_2} = 0,4 \text{ л}$	0,01	0,005			
$n_{H_2} = 0,01 \text{ моль}$	0,336 л	224	672	224	0
$n_{H_2} = 0,02 \text{ моль}$	0,45 л	0,01	0,03	0,01	0 моль
$n_{H_2} = 0,01 \text{ моль}$	0,01	0,02	0,01	0,01	0,02 моль



~~$Ca + NH_3 \rightarrow Ca(NH_2)_2 + H_2 \uparrow$~~ ✓

~~$2Ca + 2NH_3 \rightarrow 2Ca(NH_2)_2 + 2H_2 \uparrow$~~ ✓

$1/ Ca + 2NH_3 \rightarrow Ca(NH_2)_2 + H_2 \uparrow$ ✓

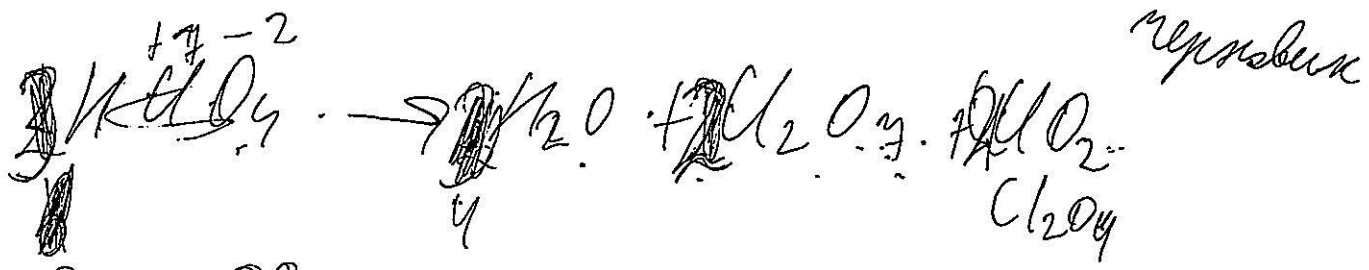
$2/ Ca + 2NH_3 \rightarrow Ca(NH_2)_2 + H_2 \uparrow$ ✓

$3/ 3Ca + 2NH_3 \rightarrow Ca_3N_2 + 3H_2 \uparrow$ ✓

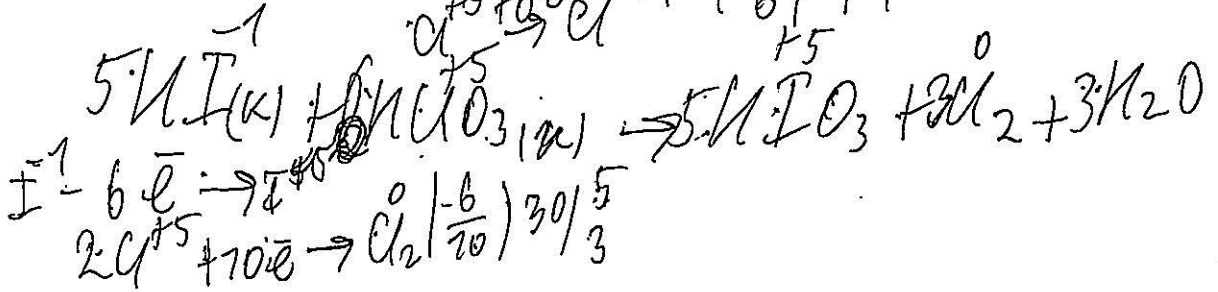
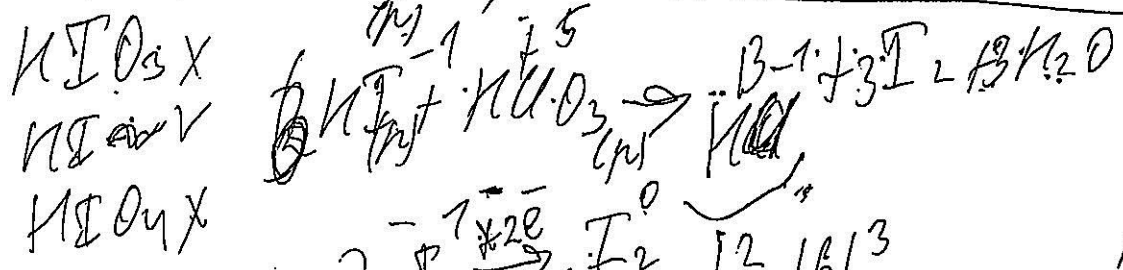
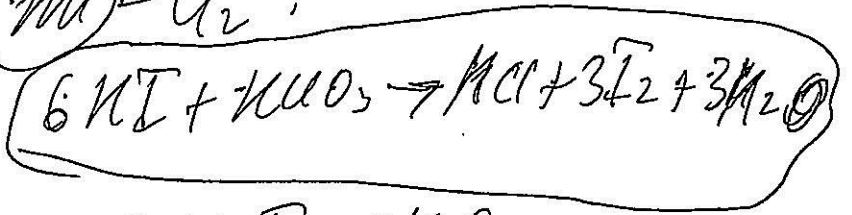
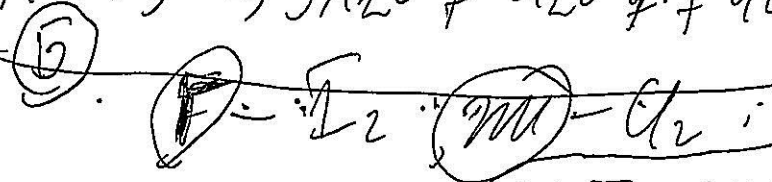
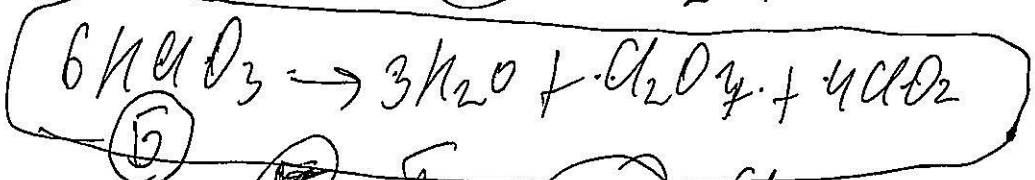
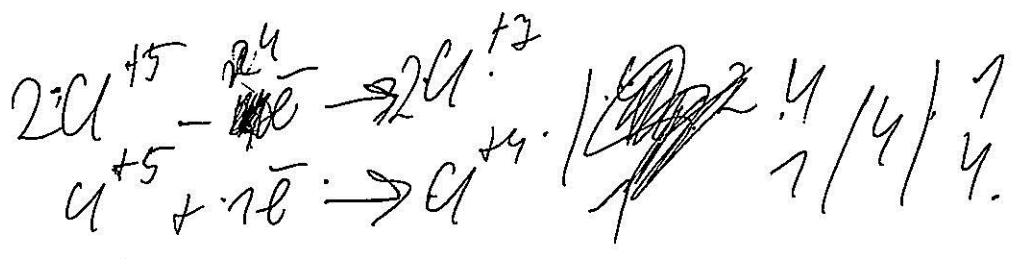
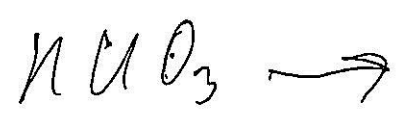
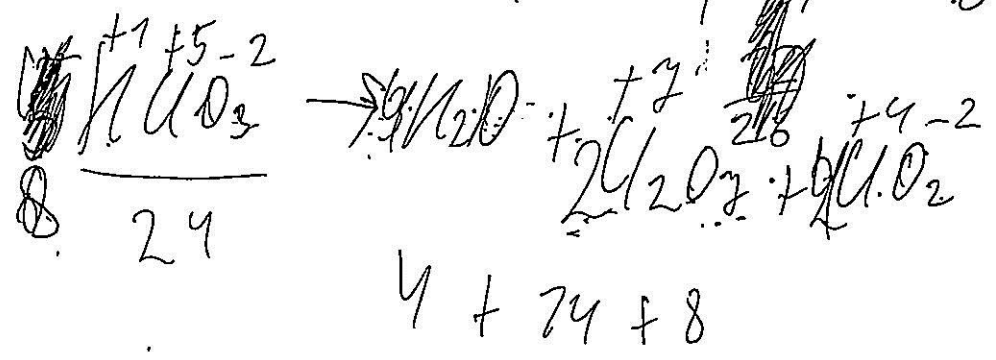
~~$Ca + NH_3 \rightarrow Ca(NH_2)_2 + H_2 \uparrow$~~

~~$2Ca + 2NH_3 \rightarrow 2Ca(NH_2)_2 + 2H_2 \uparrow$~~

$3Ca + 2NH_3 \rightarrow Ca_3N_2 + 3H_2 \uparrow$



8. 32 4 + + 8



Часть 2

Олимпиада: **Химия 10 класс (2 часть)**

Шифр: **21300304**

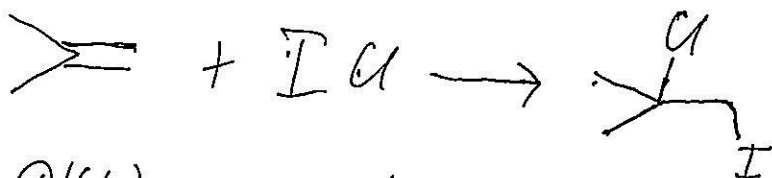
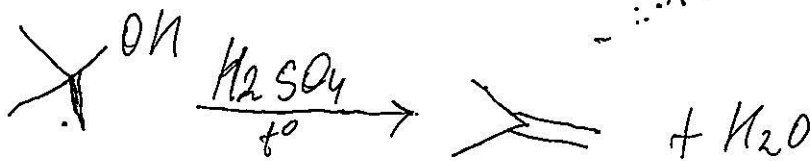
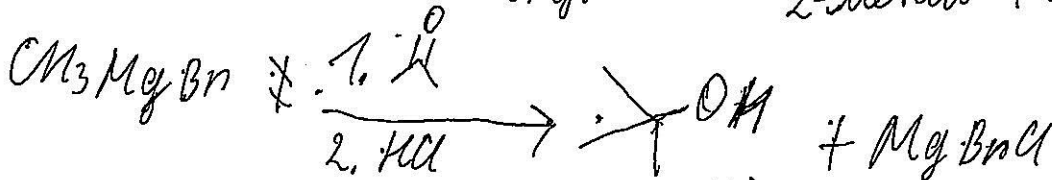
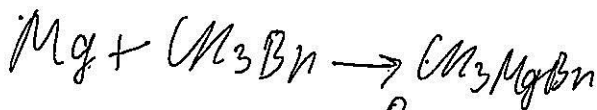
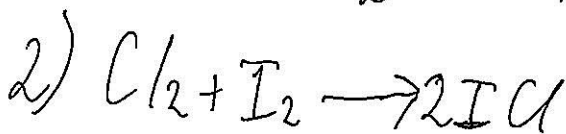
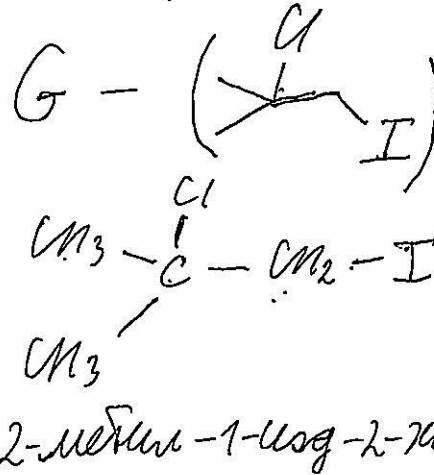
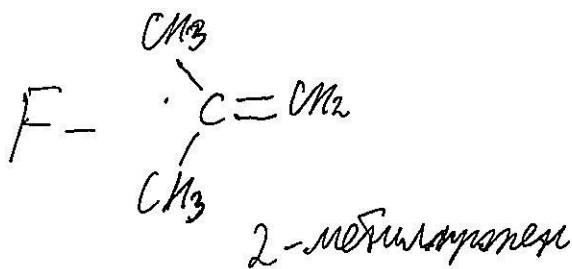
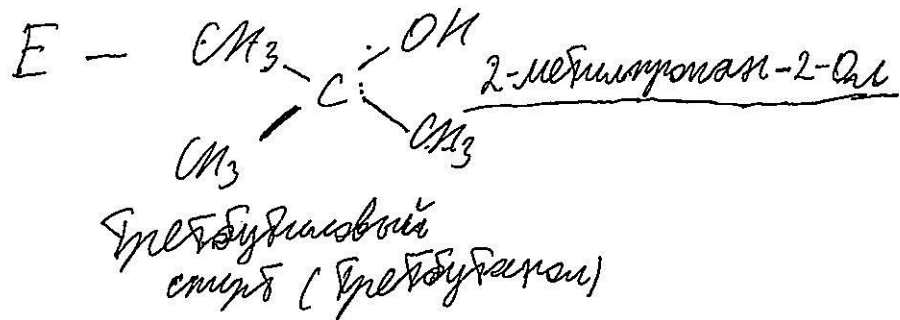
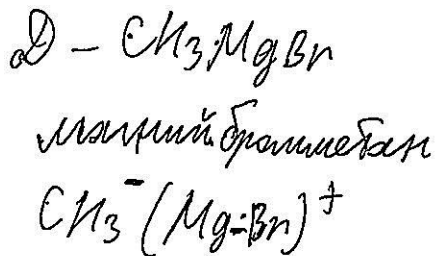
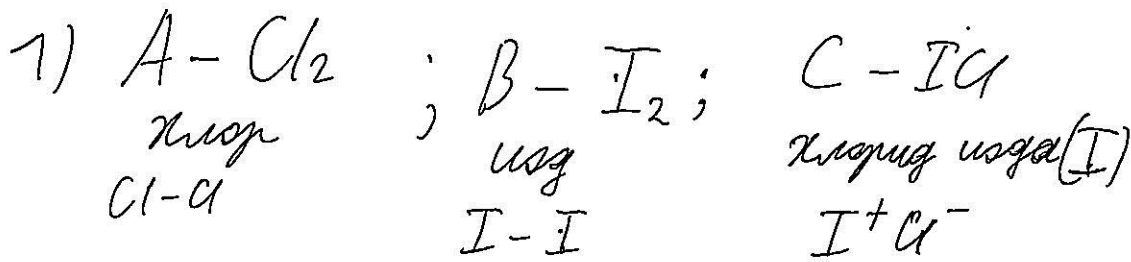
ID профиля: **867266**

Вариант 1

Задача 4

Шифровик

1



3) $\nu(\text{Cl}_2) = \frac{273}{71} = \nu(\text{I}_2) = \frac{76,2}{254} = \frac{\nu(\text{ICl})}{2} = 0,3 \text{ моль};$

$M(\text{ICl}) = 2 \cdot 87,25 = 162,5 \text{ г/моль};$

$m(\text{ICl}) = m(\text{Cl}_2) + m(\text{I}_2) = 21,3 + 76,2 = 0,3 \cdot 162,5 = 47,5 \text{ г}.$

$\nu(\text{Mg}) = 1 \text{ моль}; \nu(\text{CH}_3\text{Br}) = 1 \text{ моль}; \Rightarrow \nu(\text{CH}_3\text{MgBr}) = 1 \text{ моль}$

$\nu(\text{CH}_3\text{MgBr}) = 1 \text{ моль} = \nu(\text{CH}_3\text{MgBr});$

Задача 11. Числовик

(2)

$$m(\text{HCl}) = 300 \cdot 0,15 = 45 \text{ г}$$

$$\nu(\text{HCl}) = \frac{45}{36,5} \cdot \frac{75}{100} = 0,925 \text{ моль} = 7,233 \text{ моль};$$

$$m(\text{H}_2\text{SO}_4) = 300 \cdot 0,3290 \text{ г}; \nu(\text{H}_2\text{SO}_4) = 0,92 \text{ моль}.$$

$$\nu(\text{HCl}) = 7,233 > 1; \text{HCl} - \text{в избытке}; \nu(\text{H}_2\text{SO}_4) = 0,92 \text{ моль};$$

по выводу 75%;

$$\nu(\text{H}_2\text{SO}_4) = 1; 100 \cdot 75 = 75 \text{ моль};$$

$$\nu(\text{H}_2\text{SO}_4) = 0,92 > 0,75; \text{H}_2\text{SO}_4 \text{ в избытке}; \nu(\text{HCl}) = 0,75 \text{ моль};$$

выход 80%;

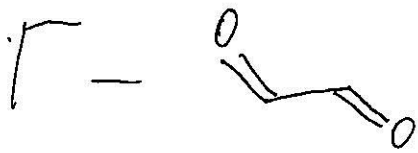
$$\nu(\text{HCl}) = 0,75 \cdot \frac{80}{100} = 0,6 \text{ моль}.$$

$$\nu(\text{HCl}) = \nu(\text{H}_2\text{SO}_4) = 0,6 \text{ моль} = \nu(\text{X})$$

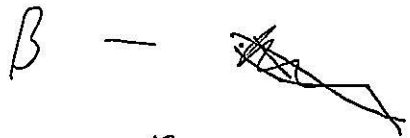
$$m(\text{X}) = 0,6 \cdot 228,5 = 137,1 \text{ г}.$$

Ответ: 137,1 г.

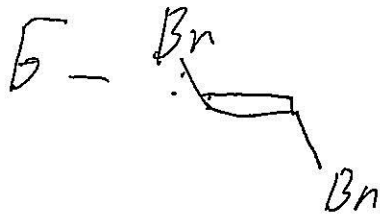
1) А - $\text{CH}_2=\text{CH}-$ ацетилен



Этан-1,2-диаль



Этан-1,2-диол

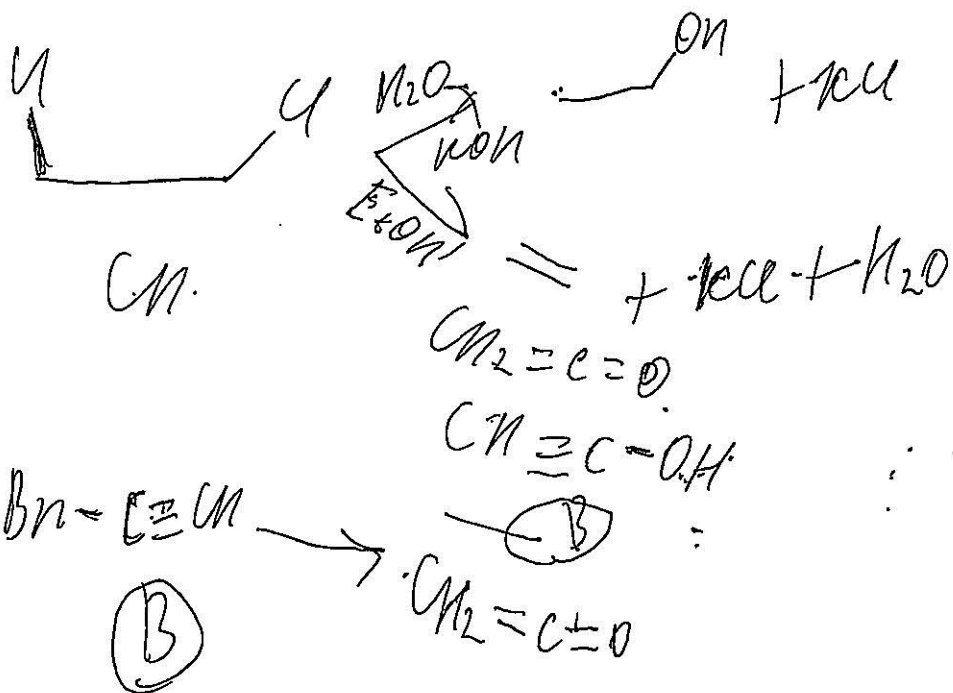


1,2-дибромэтан

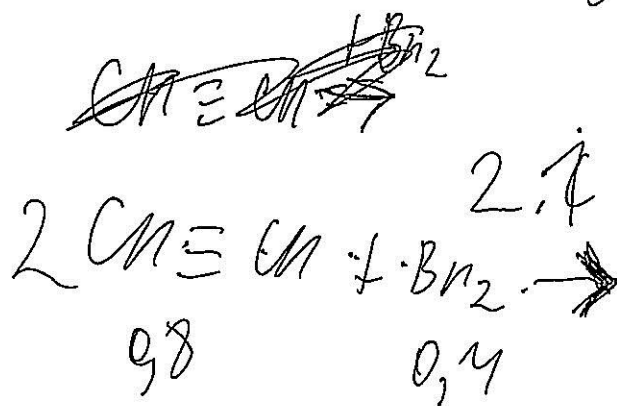
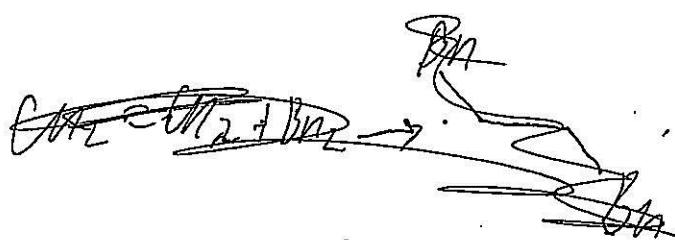
2) CH_2 Полиацетилена



$\text{A} + \text{Bn}_2 \rightarrow \text{Br}-\text{CH}=\text{CH}-\text{Bn} \quad \text{B}$
 $\text{B} \xrightarrow[\text{E60K.}]{\text{KOH}} \text{B}$
 $\text{A} - \text{CH} \equiv \text{CH}$
 $\text{CH}_2 = \text{C} \begin{matrix} \text{Bn} \\ \text{Bn} \end{matrix}$
 $\text{CH} \equiv \text{CBn}$
 $\text{CH}_2 = \text{C} \begin{matrix} \text{Bn} \\ \text{Bn} \end{matrix}$
 F



$(CH_2=CH_2)$
полиэтилен.

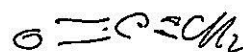
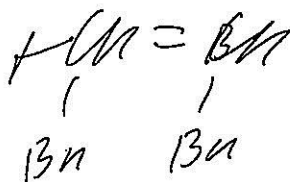
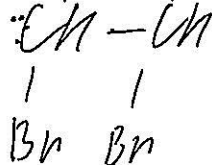
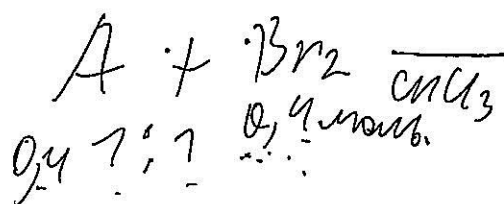


непробук

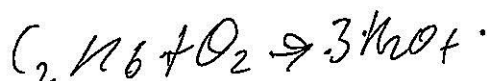
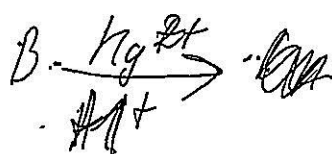
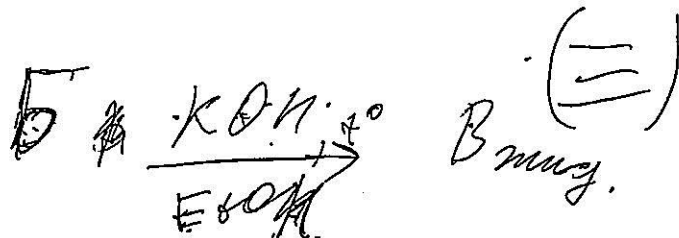
Задача 5, Бу

~~CHCl3~~

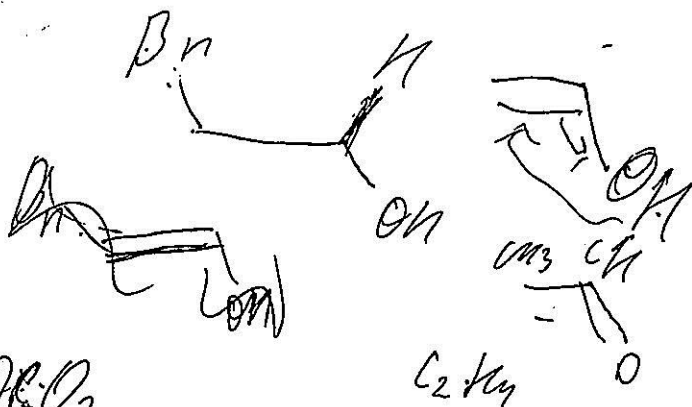
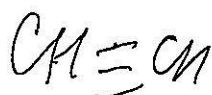
~~CHCl3~~



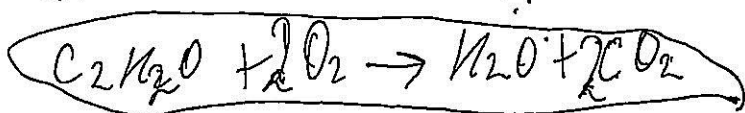
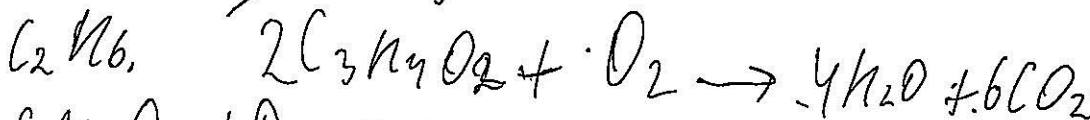
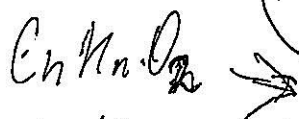
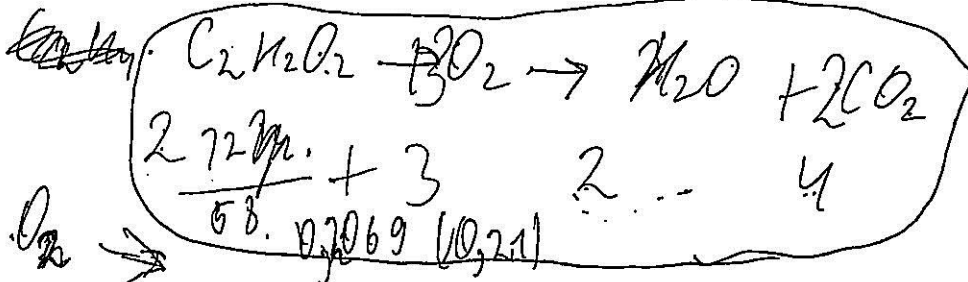
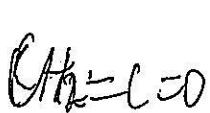
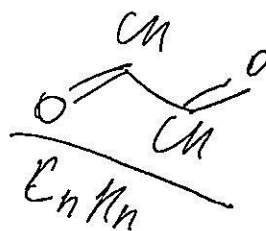
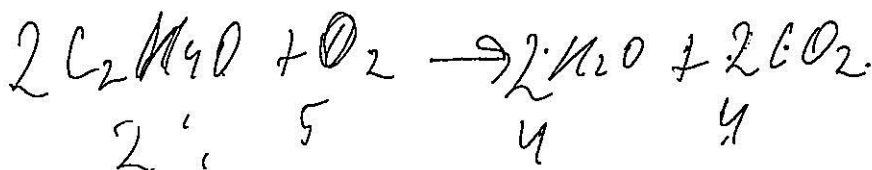
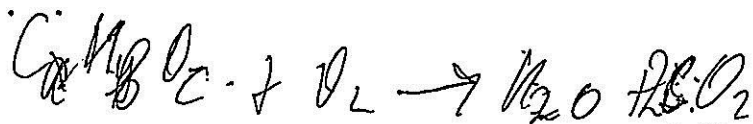
2. 1
 26.
 ? $CH \equiv CH$?



2. 2
 704 ?



0,4 моль



$\frac{12}{42} = 0,285$ г/моль

