

Шифр: А - 4

Всероссийская олимпиада школьников
Региональный этап

по Химии

2018/2019

Ленинградская область

Район г. Сосновы Бор

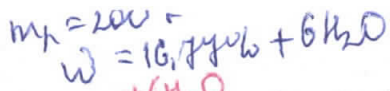
Школа Гимназия №5

Класс 9 А

ФИО КОНДРАТЬЕВ НИКОЛАЙ

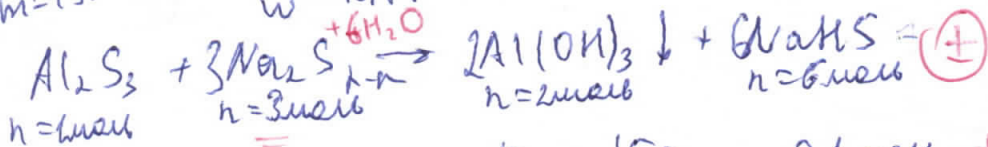
РУСЛАНОВИЧ

$m = 15r$



A-4

Задача 9-1



1) $n(Al_2S_3) = \frac{m}{M} = \frac{15r}{150 \frac{r}{\text{моль}}} = 0,1 \text{ моль} +$
 2) $n(Na_2S) = \frac{m_{Na_2S}}{M} = \frac{200r \cdot 0,1077}{78 \frac{r}{\text{моль}}} = 0,43 \text{ моль} \text{ (в избытке)} \Rightarrow$

\Rightarrow продукт по Al_2S_3
 3) $n(Na_2S)_{ост.} = 0,43 - 0,1 = 0,33 \text{ моль} (-)$
 4) $m[Al(OH)_3] = M \cdot n = 78 \frac{r}{\text{моль}} \cdot 0,2 \text{ моль} = 15,6r \downarrow$
 5) $n(NaHS) = \frac{n}{6} = \frac{0,1}{1} = 0,6 \text{ моль} \quad m(NaHS) = M \cdot n = 0,6 \text{ моль} \cdot 56 \frac{r}{\text{моль}} = 33,6r$

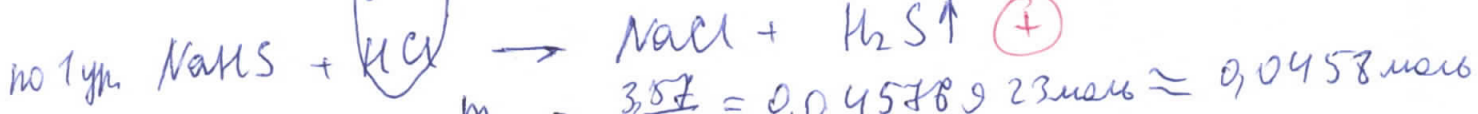
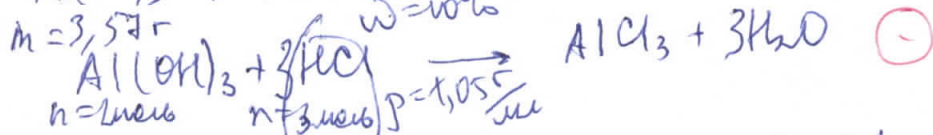
7) $m_{вещ-ва} = m(Al_2S_3) + m_{Na_2S} + m_{H_2O} - m[Al(OH)_3] =$
 $= 15r + 200r + (M_{H_2O} \cdot n_{H_2O}) - 15,6r = 210,2r$

8) $w_{Na_2S} = \frac{m_{Na_2S}}{m_{вещ-ва}} = \frac{25,74r}{210,2r + 59,54r} = 12,25\% \quad 0,4323$

9) $m_{ост. Na_2S} = M \cdot n_{ост. Na_2S} = 78 \cdot 0,33 = 25,74r$

48

10) $w_{NaHS} = \frac{m_{NaHS}}{m_{вещ-ва}} = \frac{33,6r}{210,2r + 59,54r} = 15,98\%$

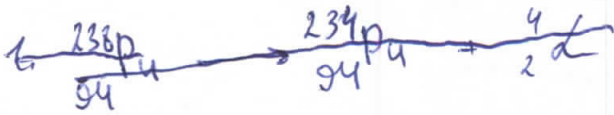


1) $n[Al(OH)_3] = \frac{m}{M} = \frac{3,87}{78} = 0,0495 \text{ моль} \approx 0,0458 \text{ моль}$
 2) $n(HCl) = \frac{n}{3} = \frac{0,0458}{1} = 0,1374 \text{ моль}$
 3) $m_{HCl} = \frac{m_{в}}{w} = \frac{M \cdot n}{w} = \frac{36,5 \cdot 0,1374}{0,1} = 50,151r$
 4) $V_{HCl} = \frac{m_{HCl}}{p} = \frac{50,151r}{1,05 \frac{r}{\text{мл}}} = 47,76285714 \text{ мл}$

по 2-му: на 1 моль $Al(OH)_3$ требуется 3 моль HCl и 1 моль $NaHS$:
 $V_{HCl} \approx 47,763 \text{ мл} - 3 \text{ моль} \Rightarrow x = \frac{47,76285714}{3} = 15,92095238$

5) $V_{MAX} = 63,638095 \text{ мл}$ \Rightarrow $x = \frac{47,76285714}{3} = 15,92095238$
 Ответ: $63,638095 \text{ мл}; 12,25\%; 15,98\%$

~~Zagawa 9-6~~



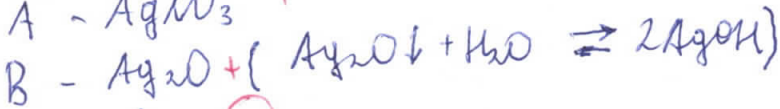
2. ~~$n(\text{Pu})$ za 100g mienag: za~~

$$T_{\frac{1}{2}} = 87,7 = \frac{\ln 2}{k} = \frac{0,693}{k} \Rightarrow k =$$

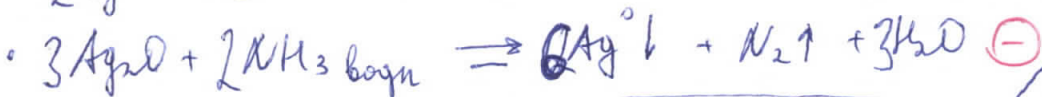
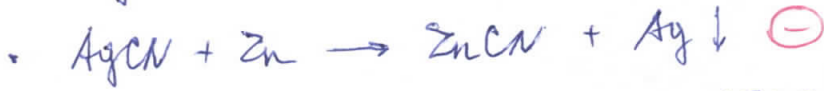
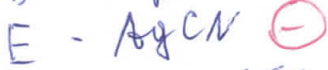
3.

~~Zagawa~~

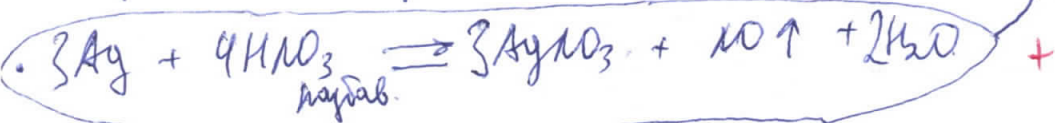
1.



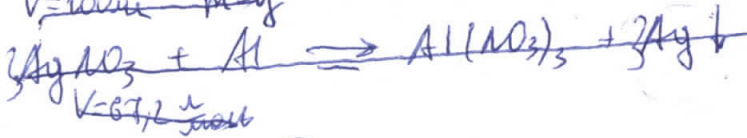
4,53.



35.

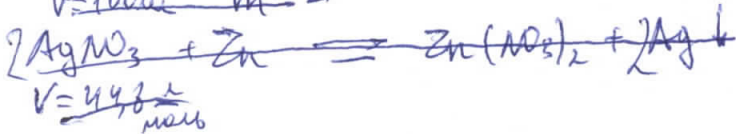


~~$V=100\text{ml}$ $m=9$~~



$\Sigma = 7,55$

~~$V=100\text{ml}$ $m=2$~~



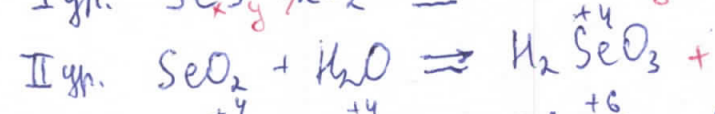
~~$m(\text{Ag}) = m(\text{AgNO}_3) = x$~~

Zagawa 9-4
 $\overset{+2}{\text{Se}}\overset{-2}{\text{S}}$

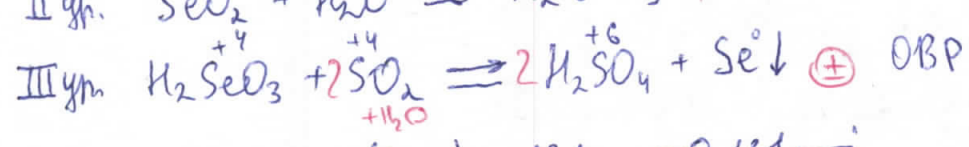
- 1. A - SeS \ominus
- B - SeO₂ +
- B - SO₂ +
- Γ - H₂SeO₄ \ominus
- Δ - H₂SO₄ +

35.

Σ = 5r.



25.

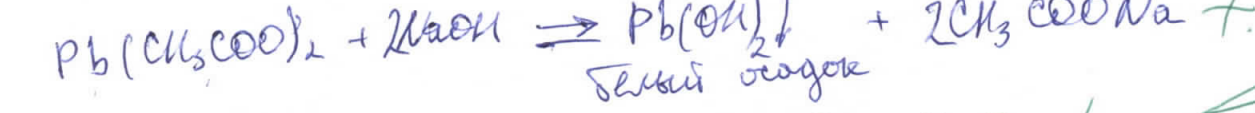
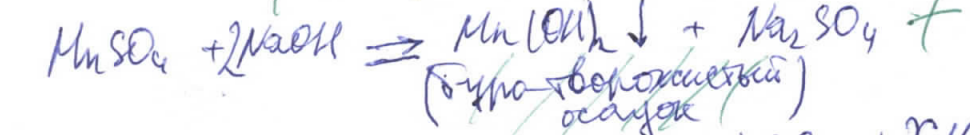
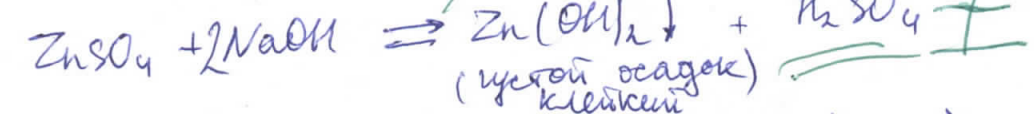
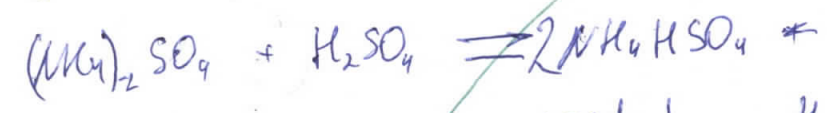
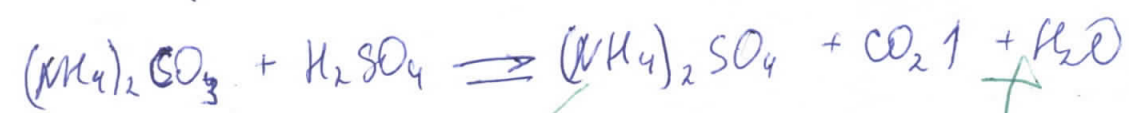
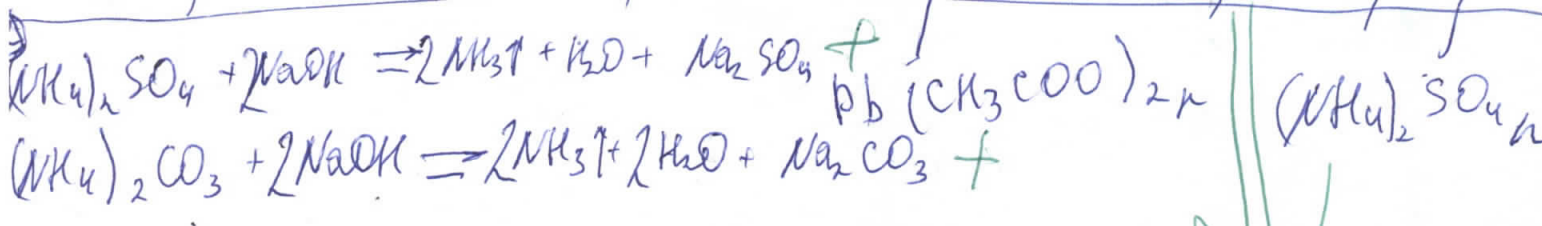


3. ~~Dano!~~ ~~$m(\text{SeS}) = 131 \mu = 0,131 \text{ r}$~~ ; ~~$m(\text{SeO}_2) = 110 \mu = 0,110 \text{ r}$~~ ; ~~$V(\text{SO}_2) = 58,2 \mu = 0,0582 \text{ r}$~~

~~$\frac{p_0 V_0}{T_0} = \frac{p V}{T}$~~
 ~~$p_0 = p_0 = p, T_0 = T$~~

~~$\frac{22,4 \mu}{273 \text{ K}} = \frac{0,0582 \mu}{T} \Rightarrow T = 0,109 \text{ K}$~~

3) 8.1 \leftarrow / 8.2 \leftarrow / 8.3 \rightarrow / 8.4 \rightarrow / 8.5 \leftarrow / 8.6 \leftarrow / 8.7 \rightarrow / 8.8 \leftarrow



	NaCl	$(NH_4)_2CO_3$	$(NH_4)_2SO_4$	$ZnSO_4$	$MnSO_4$	Na_2CO_3	$CaCO_3$	
H_2O	р	р	р	р	р	р	р/р	р
NaOH	-	$NH_3\uparrow$	$NH_3\uparrow$	белый осажок клевани ↓	было-бором ↓ ±	-	$Ca(OH)_2$ мало/р	белый
H_2SO_4	-	$CO_2\uparrow$	-	-	-	$CO_2\uparrow$	$CO_2\uparrow$	белый

$(NH_4)_2SO_4$
 $(NH_4)_2CO_3$
↓
12

8

24
↓
Pb(CH₃COO)₂

9

поиграйте никелай

A-4