

Класс 8 Вариант 1 Дата Олимпиады 24.02.18

Площадка написания РГУ им. Н.И. Пирогова

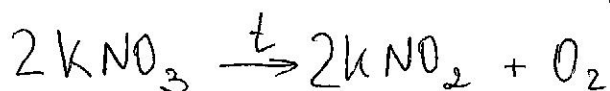
Задача	1	2	3	4	5	6	Σ		Подпись
							Цифрой	Прописью	
Оценка	5	5	5	5	5	5	30	тридцать	<i>[Signature]</i>

Задача 1.

$$K : N : O = \frac{M(K)}{Ar(K)} : \frac{M(N)}{Ar(N)} : \frac{M(O)}{Ar(O)} = \frac{38,64}{39} : \frac{13,85}{14} : \frac{47,48}{16} =$$

$$0,99 : 0,99 : 2,96 \approx 1 : 1 : 3$$

KNO_3 - вещество А (нитрат калия)



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Задача 2.

$$m(KNO_3)_{p-p1} = m_{p-p} \cdot \omega(KNO_3) = 200 \text{ г} \cdot 0,1 = 20 \text{ г}$$

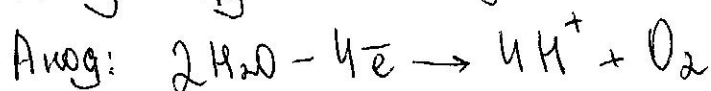
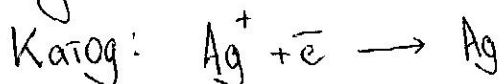
$$m(KNO_3)_{p-p2} = 400 \text{ г} \cdot 0,2 = 80 \text{ г}$$

$$m(KNO_3)_{одн.} = 20 \text{ г} + 80 \text{ г} = 100 \text{ г} \quad m_{(p-p)}_{одн.} = 200 \text{ г} + 400 \text{ г} = 600 \text{ г}$$

$$\omega(KNO_3) = \frac{m(KNO_3)_{одн.}}{m_{(p-p)}_{одн.}} = \frac{100 \text{ г}}{600 \text{ г}} \cdot 100\% = 16,67\%$$

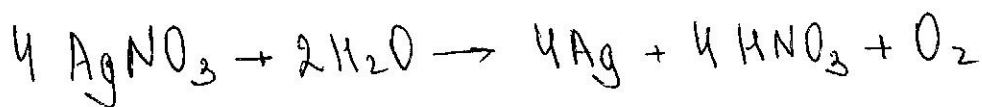
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Задача 3.





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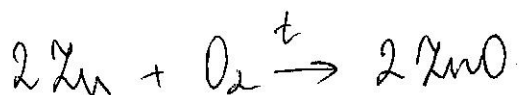
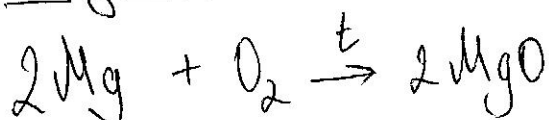
$$V(\text{O}_2) = 8,4 \text{ л}$$

$$\nu(\text{O}_2) = \frac{V}{V_0} = \frac{8,4 \text{ л}}{22,4 \frac{\text{л}}{\text{моль}}} = 0,375 \text{ моль}$$

$$4 \nu(\text{O}_2) = \nu(\text{Ag}) \Rightarrow \nu(\text{Ag}) = 1,5 \text{ моль}$$

$$m(\text{Ag}) = M_r(\text{Ag}) \cdot \nu = 1,5 \text{ моль} \cdot 108 \frac{\text{г}}{\text{моль}} = 162 \text{ г}$$

Задача 4



$$24x + 65y = 15,4$$

$$40x + 81y = 20,2$$

$$x = \frac{15,4 - 65y}{24}$$

$$24$$

$$\frac{40(15,4 - 65y)}{24} + 81y = 20,2$$

$$1,667(15,4 - 65y) + 81y = 20,2$$

$$25,667 - 108,33y + 81y = 20,2$$

$$27,33y = 5,467$$

$$y = 0,2$$

$$x = 0,1$$

пусть $\nu(\text{Mg}) = x$
 $\nu(\text{Zn}) = y$

$$\nu(\text{MgO}) = \nu(\text{Mg})$$

$$\nu(\text{ZnO}) = \nu(\text{Zn})$$

$$\nu(\text{Mg}) = 0,1 \text{ моль}$$

$$\nu(\text{Zn}) = 0,2 \text{ моль}$$

$$m(\text{Mg}) = M_r(\text{Mg}) \cdot \nu = 24 \frac{\text{г}}{\text{моль}} \cdot 0,1 = 2,4 \text{ г}$$

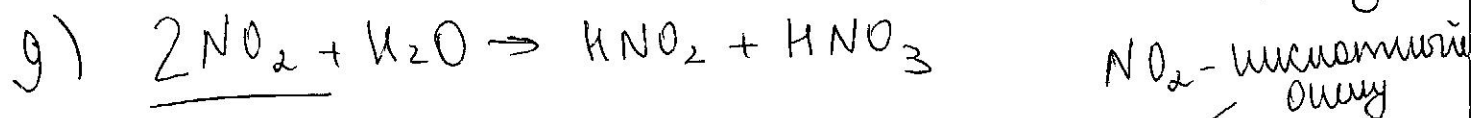
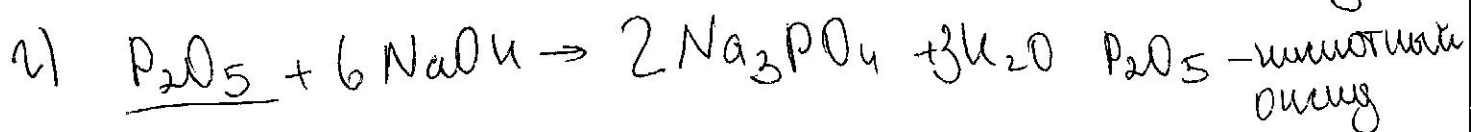
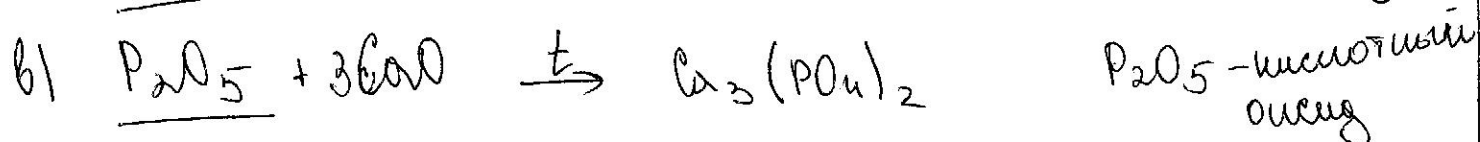
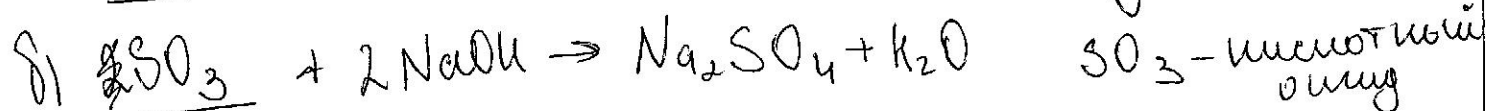
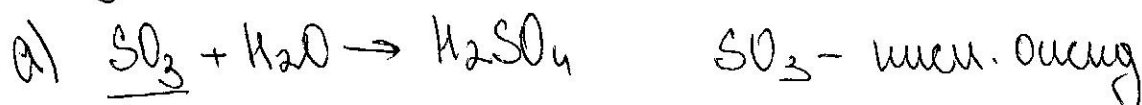
$$m(\text{Zn}) = M_r(\text{Zn}) \cdot \nu = 65 \frac{\text{г}}{\text{моль}} \cdot 0,2 = 13 \text{ г}$$

$$\omega(\text{Zn}) = \frac{m(\text{Zn})}{m(\text{см})} \cdot 100\%$$

$$\frac{13 \text{ г}}{15,4 \text{ г}} \cdot 100\% = 84,42\%$$

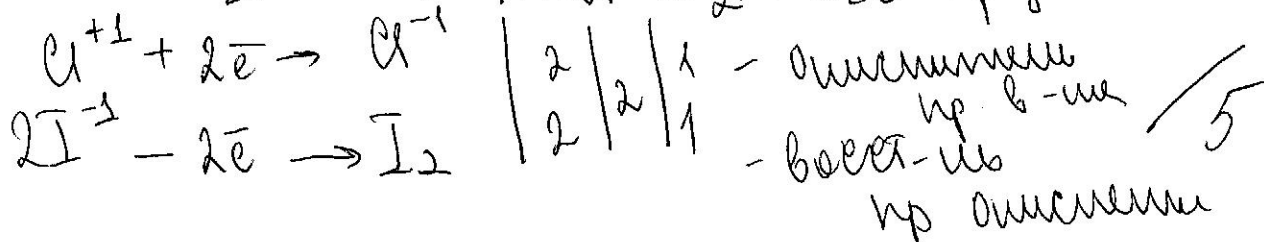
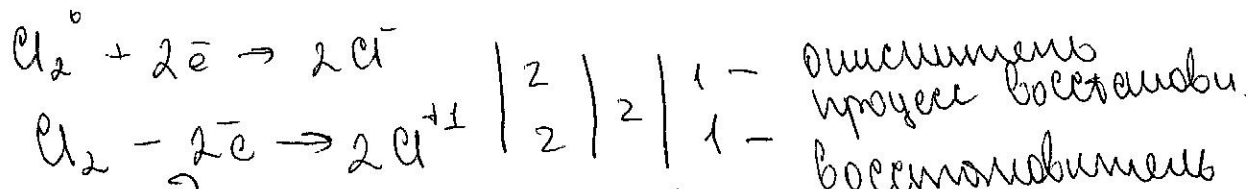
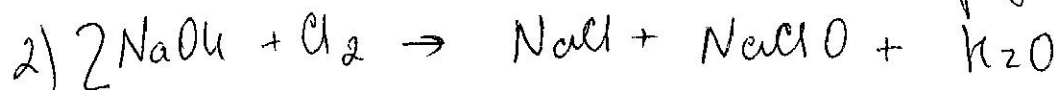
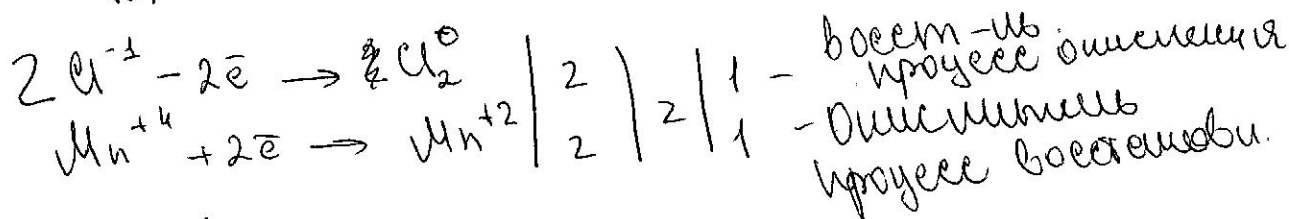
$$\omega(\text{Mg}) = \frac{m(\text{Mg})}{m(\text{см})} \cdot 100\% = \frac{2,42}{15,42} \cdot 100\% = 15,58\%$$

Задача 5



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Задача 6.



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