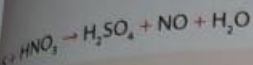




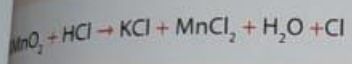
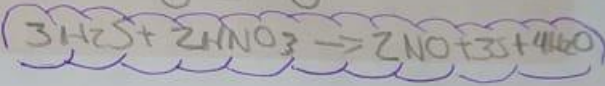
1. Balancea por óxido-reducción las siguientes ecuaciones químicas, teniendo en cuenta los números de oxidación y plantea semirreacciones para cada una, indica quien se oxida y quien se reduce.



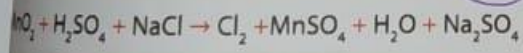
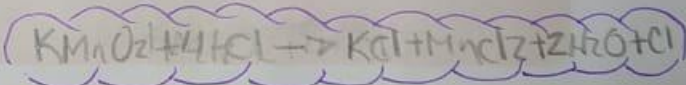
$$\begin{aligned} \text{H} &= 3 \times 2 + 2 \times 1 = 8 & \text{H} &= 4 \times 2 = 8 \\ \text{S} &= 3 \times 1 = 3 & \text{S} &= 3 \times 1 = 3 \\ \text{N} &= 2 \times 1 = 2 & \text{N} &= 2 \times 1 = 2 \\ \text{O} &= 2 \times 3 = 6 & \text{O} &= 2 \times 1 + 4 \times 1 = 6 \end{aligned}$$

$$3 \times 0 + 2 \times 0 = 3 \times 0 + 2 \times 0 + 4 \times 0$$

$$0 = 0$$

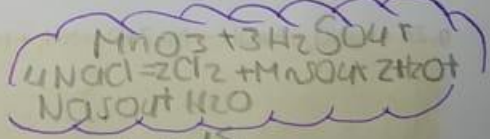


$$\begin{aligned} \text{K} &= 1 \times 1 = 1 & \text{K} &= 1 \times 1 = 1 \\ \text{Mn} &= 1 \times 1 = 1 & \text{Mn} &= 1 \times 1 = 1 \\ \text{O} &= 1 \times 2 = 2 & \text{O} &= 2 \times 1 = 2 \\ \text{H} &= 4 \times 1 = 4 & \text{H} &= 2 \times 2 = 4 \\ \text{Cl} &= 4 \times 1 = 4 & \text{Cl} &= 1 \times 1 + 1 \times 2 + 1 \times 1 = 4 \\ & & \text{O} &= 0 \end{aligned}$$



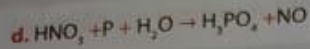
$$\begin{aligned} \text{Na} &= 4 \times 1 = 4 \\ \text{Cl} &= 4 \times 1 = 4 \\ \text{Mn} &= 1 \times 1 = 1 \\ \text{O} &= 1 \times 3 + 3 \times 4 = 15 \\ \text{H} &= 3 \times 2 = 6 \\ \text{S} &= 3 \times 1 = 3 \end{aligned}$$

$$\begin{aligned} \text{Na} &= 2 \times 2 = 4 \\ \text{Cl} &= 2 \times 2 = 4 \\ \text{Mn} &= 1 \times 1 = 1 \\ \text{O} &= 1 \times 4 + 2 \times 1 + 2 \times 4 + 1 \times 1 = 15 \\ \text{H} &= 2 \times 2 + 1 \times 2 = 6 \\ \text{S} &= 1 \times 1 + 2 \times 1 = 3 \end{aligned}$$



$$4 \times 0 + 1 \times 0 + 3 \times 0 = 2 \times 0 + 1 \times 0 + 2 \times 0 + 1 \times 0$$

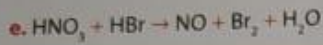
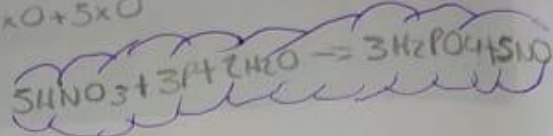
$$0 = 0$$



$$\begin{array}{l} \text{P} = 3 \times 1 = 3 \\ \text{H} = 5 \times 1 + 2 \times 2 = 9 \\ \text{N} = 3 \times 1 = 3 \\ \text{O} = 3 \times 3 + 2 \times 1 = 11 \end{array} \quad \begin{array}{l} \text{P} = 3 \times 1 = 3 \\ \text{H} = 3 \times 3 = 9 \\ \text{N} = 5 \times 1 = 5 \\ \text{O} = 3 \times 4 + 5 \times 1 = 17 \end{array}$$

$$3 \times 0 + 5 \times 0 + 2 \times 0 = 3 \times 0 + 5 \times 0$$

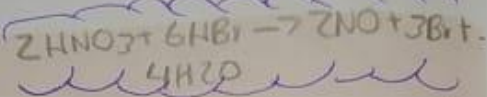
$$0 = 0$$



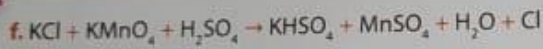
$$\begin{array}{l} \text{H} = 6 \times 1 + 2 \times 1 = 8 \\ \text{Br} = 6 \times 1 = 6 \\ \text{N} = 2 \times 1 = 2 \\ \text{O} = 2 \times 3 = 6 \end{array} \quad \begin{array}{l} \text{H} = 4 \times 2 = 8 \\ \text{Br} = 3 \times 2 = 6 \\ \text{N} = 2 \times 1 = 2 \\ \text{O} = 2 \times 1 + 4 \times 1 = 6 \end{array}$$

$$6 \times 0 + 2 \times 0 = 3 \times 0 + 2 \times 0 + 4 \times 0$$

$$0 = 0$$



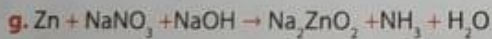
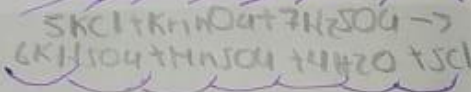
82



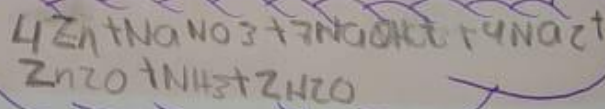
$$\begin{array}{l} \text{K} = 5 \times 1 \times 1 = 6 \\ \text{Cl} = 5 \times 1 = 5 \\ \text{Mn} = 1 \times 1 = 1 \\ \text{O} = 1 \times 4 + 7 \times 4 = 32 \\ \text{H} = 7 \times 2 = 14 \\ \text{S} = 7 \times 1 = 7 \end{array} \quad \begin{array}{l} \text{K} = 6 \times 1 = 6 \\ \text{Cl} = 5 \times 1 = 5 \\ \text{Mn} = 1 \times 1 = 1 \\ \text{O} = 1 \times 4 + 6 \times 4 + 4 \times 1 = 32 \\ \text{H} = 6 \times 1 + 9 \times 2 = 14 \\ \text{S} = 1 \times 6 \times 1 = 7 \end{array}$$

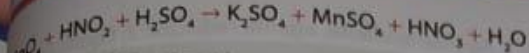
$$5 \times 0 + 1 \times 0 + 7 \times 0 = 5 \times 0 + 1 \times 0 + 6 \times 0 + 4 \times 0$$

$$0 = 0$$



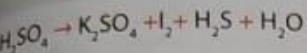
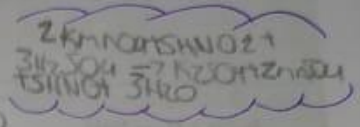
$$\begin{array}{l} \text{Zn} = 4 \times 1 = 4 \\ \text{Na} = 1 \times 1 + 7 \times 1 = 8 \\ \text{N} = 1 \times 1 = 1 \\ \text{O} = 1 \times 3 + 7 \times 1 = 10 \\ \text{H} = 7 \times 1 = 7 \end{array} \quad \begin{array}{l} \text{Zn} = 4 \times 1 = 4 \\ \text{Na} = 4 \times 2 = 8 \\ \text{N} = 1 \times 1 = 1 \\ \text{O} = 5 \times 3 + 2 \times 4 + 1 \times 4 \\ \text{H} = 1 \times 3 + 2 \times 2 = 7 \end{array}$$





$4 = 5x + 13x = 11$   
 $N = 5x = 5$   
 $O = 5x + 2x + 4 + 3x + 4 = 30$   
 $K = 2x = 2$   
 $Mn = 2x = 2$   
 $S = 3x = 3$

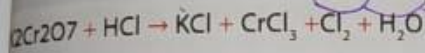
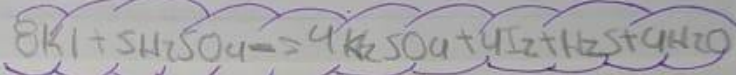
$H = 5x + 13x = 11$   
 $N = 5x = 5$   
 $O = 5x + 2x + 4 + 3x + 4 = 30$   
 $K = 2x = 2$   
 $Mn = 2x = 2$   
 $S = 3x + 1x = 3$



$8 = 2x = 8$   
 $I = 4x = 8$   
 $H = 1x + 2x + 4x = 10$   
 $S = 1x + 4x = 5$   
 $O = 5x + 4 = 20$

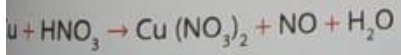
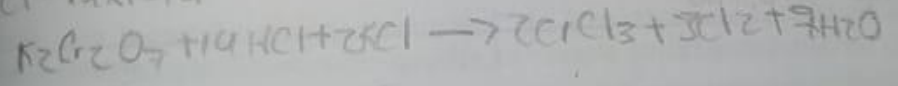
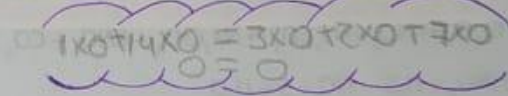
$K = 4x = 8$   
 $I = 4x = 8$   
 $H = 1x + 2x + 4x = 10$   
 $S = 1x + 4x = 5$   
 $O = 4x + 4x = 20$

$8\text{H}_2\text{O} + 5\text{K}_2\text{O} = 4\text{K}_2\text{O} + 1\text{K}_2\text{O} + 4\text{K}_2\text{O} + 4\text{K}_2\text{O}$



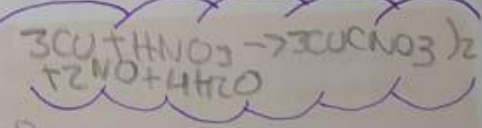
$K = 1x = 2$   
 $Cr = 1x = 2$   
 $O = 1x = 7$   
 $H = 14x = 14$   
 $Cl = 14x = 14$

$K = 2x = 2$   
 $Cr = 2x = 2$   
 $O = 7x = 7$   
 $H = 7x = 14$   
 $Cl = 3x + 2x + 2x = 14$



$\text{Cu} = 3x = 3$   
 $\text{H} = 8x = 8$   
 $\text{N} = 8x = 8$   
 $\text{O} = 8 \times 3 = 24$

$\text{Cu} = 3x = 3$   
 $\text{H} = 4x = 8$   
 $\text{N} = 3x + 2x = 8$   
 $\text{O} = 3x + 2x + 4x = 24$



$3x\text{O} + 8x\text{O} = 3x\text{O} + 2x\text{O} + 4x\text{O}$