.3 - Balancing Redox Reactions with Oxidation Numbers.notebook

7.3 - Balancing Equations with Oxidation Numbers Assignment

1. Balance the following redox reactions using the oxidation number method.

2. Balance each of the following redox reactions in acidic solutions using both methods:

a)
$$ClO_4^- + Br$$
 \rightarrow $Cl^- + BrO_3^-$
+7-2 -1 +5-2

i) Oxidation Numbers:

Br: 17+57+6change

ii) Half Reactions
$$(8e^{-+}8H^{+} + C104^{-} \rightarrow C1^{-} + 4H_{2}0)6$$

$$(3H_{2}0 + Br^{-} \rightarrow Br03^{-} + 6H^{+} + 6e^{-})8$$

$$(8e^{-+}8H^{+} + 29H_{2}0 + 6C104^{-} + 5Br^{-} \rightarrow 6C1^{-} + 29H_{2}0 + 8Br03^{-} + 48H^{+} \cdot Ore$$

a)
$$HNO_3 + Cu \rightarrow NO_2 + Cu^2+$$

i) Oxidation Numbers: $+4 \cdot 2 + 2 + 4 \cdot 2 + 4$

CuiN

ii) Half Reactions

3. Balance the following redox reactions in basic solutions using both methods:

a)
$$CIO_3$$
 + MnO_2 \rightarrow CI + MnO_4

ii) Half Reactions
$$60H_{2}O + C1O_{3} \rightarrow C1 + 3H_{2}O + 60H^{-1}$$

$$6e + 60H^{-1}O + C1O_{3} \rightarrow C1 + 3H_{2}O + 60H^{-1}$$

- - i) Oxidation Numbers

Re:
$$+7 + 0$$
: -7 change $+40H^{-}$

I: $+1 + +5$: $+4$ change $+4H^{+} + 4ReO_4^{-} + 7IO^{-} \Rightarrow 7IO_3^{-} + 4Re + 4H_{a}O$

Re: I
 $4: 7$
 2
 $4: 7$
 2
 $4: 7$
 2
 $4 + 4ReO_4^{-} + 7IO^{-} \Rightarrow 7IO_3^{-} + 4Re + 4OH^{-}$