

Name: Key
 Blk: _____ Date: _____

Chemistry 12
 Electrochemistry Lesson #5
Balancing Redox Equations using Half-Reactions

IMPT: There are TWO ways to Balance REDOX Equations: using Half-Reactions and using oxidation numbers....you learn both.

This technique balances the redox equation by breaking the eqn into separate reduction / oxidation half-reactions use Major OH⁻ then add the two halves together.
~ SBMA ~ She Buys My Affection

Example 1: Balance $Os + IO_3^- \rightarrow OsO_4 + I_2$ (in acidic solution)

"Constantly"

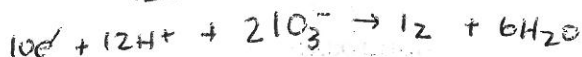


Separate into 2 "Half-Reactions"



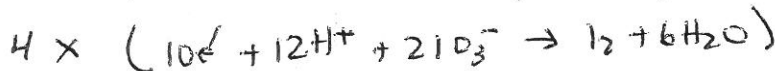
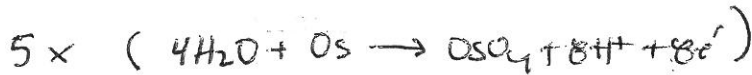
Step 2:

Balance e⁻ Major OH⁻



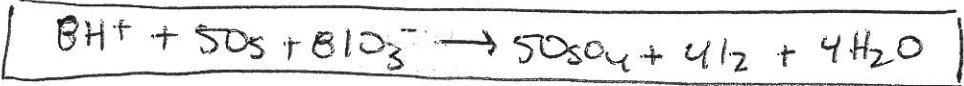
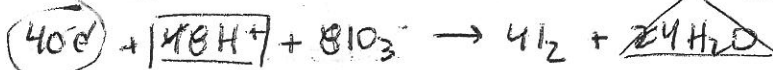
Step 3:

Multiply so that e⁻ lost = e⁻ gained



Step 4:

add the two together



Example 2. Balance $MnO_4^- + C_2O_4^{2-} \rightarrow MnO_2 + CO_2$ (in basic solution)

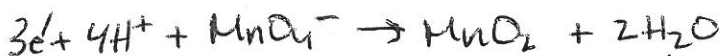
Step 1:

separate



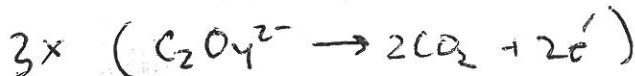
Step 2:

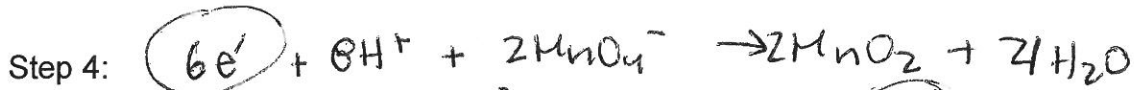
Balance



Step 3:

Multiply





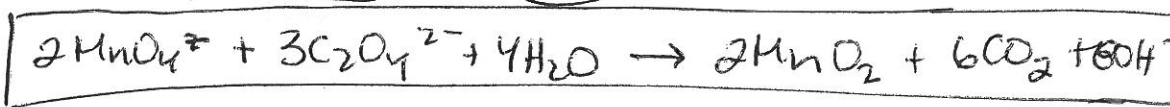
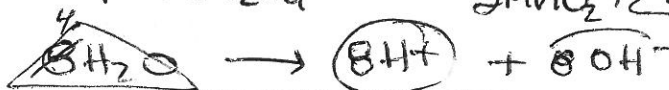
Add



Step 5:



convert H^+ to OH^-



Example 3: Balance $ClO_2^- \rightarrow ClO_3^- + Cl^-$ (in basic solution)

Step 1:



separate



Step 2:



Balance



Step 3:



Multiply



Step 4:



Add



Step 5:



convert H^+ to OH^-

There are no H^+ to convert! $\therefore 3ClO_2^- \rightarrow 2ClO_3^- + Cl^-$

DISPROPORTIONATION: A REDOX RXN IN WHICH THE SAME SPECIES UNDERGOES BOTH OXIDATION + REDUCTION

Seatwork/Homework: do exercise 24 EVEN LETTERS ONLY!!!!

PLO's T2 and T3