Big Chem: Units 26-27 REDOX, Electrochemistry

PRINT Name _____ Period _____

Half-Reaction Problems

Using Appendix 8 and the backside, write the two half reactions for each reaction, balance the electrons, and find the voltage.

Will the reaction go? Tell why.

1. $Ca + Cu^{+2} \rightarrow$
2. $Mn^{+2} + H_2Se \rightarrow$
3. $NO + Sn^{+4} \rightarrow$
4. $MnO_4^{-1} + Cr \rightarrow$
5. $Te + SO_2 \rightarrow$
6. $Ba + I_2 \rightarrow$
7. $Pb^{+2} + NO_2 \rightarrow$
8. $Cr + S \rightarrow$
9. $Rb + Co^{+2} \rightarrow$
10. $MnO_2 + Fe \rightarrow$

Chapters 26 & 27 Problems:

1. Define: a) Oxidation Number, b) Valence, c) Ion,
   d) Electrolyte, e) Electrode, f) Electrochemical Cell,
   g) Battery, h) Oxidation, i) Reduction, j) REDOX.

2. In the following, give the oxidation number for the indicated atoms: *Hint: Write x, the oxidation number, over the element and add up the oxidation numbers of the known elements.* See Rules of Oxidation Numbers.

   a. S in Na_2SO_3 , b. Mn in $KMnO_4$, c. N in $Ca(NO_3)_2$,
   d. C in Na_2CO_3, e. N in NO_2, f. S in HSO_4^-, g. S in $H_2S_2O_7$,
   h. S in $A1_2S_3$ (let Al = +3), i. Mn in $MnCl_2$ (let Cl = -1),
   j, C in $C_{12}H_{22}O_{11}$. Ans: Show work!

Use Ups & Downs method to balance these and Check your answers!

Diatomic Elements (H_2 O_2 N_2 Cl_2 Br_2 I_2 F_2) are diatomic only when FREE. Not as ions or in compds.

1. $Cr_2O_7^{-2} + Fe^{+2} + H^{+1} \rightarrow Cr^{+3} + Fe^{+3} + H_2O$
2. $MnO_2^{-1} + Sn^{+2} + H^{+1} \rightarrow Mn^{+2} + Sn^{+4} + H_2O$
3. $NO3^{-1} + Cl^{-1} + H^{+1} \rightarrow NO + Cl_2 + H_2O$
4. $NO_2 + H_2O + Mn^{+2} \rightarrow NO_3^{-1} + Mn + H^+$
5. $Cr^{+3} + I_2 + H_2O \rightarrow Cr_2O_7^{-2} + H^{+1} + I^{-1}$
6. $AsO_4^{-3} + NO + H^+ \rightarrow NO_3^{-1} + As_2O_3 + H_2O$
7. $Cu + NO_3^{-1} + H^+ \rightarrow Cu^{+2} + NO + H_2O$
8. $Sb + SO_4^{-2} + H^{+1} \rightarrow SO_2 + Sb^{+3} + H_2O$