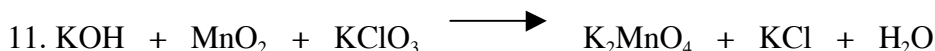
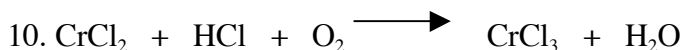
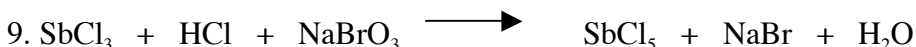
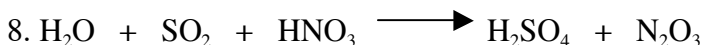
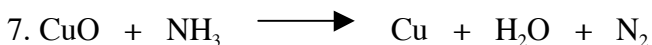
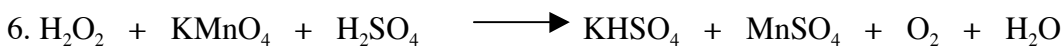
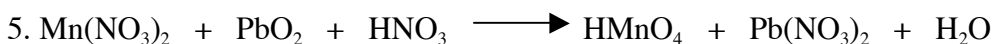


Name: _____

**HONORS CHEMISTRY
ELECTROCHEMISTRY
PAGE: 723-761**

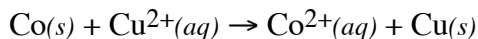
Balance by using the REDOX method



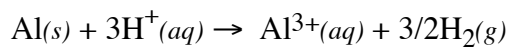
13. Define the terms *oxidation*, *reduction*, *oxidizing agent* and *reducing agent*.

Draw a diagram of the cells in which the following reactions occur. In each case, label the anode and cathode, the anode and cathode electrode material, the half-reaction at each electrode, the ions in the anode and cathode compartments and salt bridge, the direction of electron flow, and the direction of ion movement.

14.



15.



Using the table of Standard Reduction Potential shown below, identify,

16. the substance most likely to be oxidize
17. the substance most likely to be reduced
18. the strongest oxidizing agent
19. the strongest reducing agent

Standard Reduction Potentials at 25 °C		E°
<u>Half-Reaction</u>		
$\text{Li}^+(\text{aq}) + 1\text{e}^-$	$\rightarrow \text{Li}(\text{s})$	-3.05 v
$\text{K}^+(\text{aq}) + 1\text{e}^-$	$\rightarrow \text{K}(\text{s})$	-2.93 v
$\text{Ca}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Ca}(\text{s})$	-2.87 v
$\text{Na}^+(\text{aq}) + 1\text{e}^-$	$\rightarrow \text{Na}(\text{s})$	-2.71 v
$\text{Mg}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Mg}(\text{s})$	-2.37 v
$\text{Zn}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Zn}(\text{s})$	-0.76 v
$\text{Ni}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Ni}(\text{s})$	-0.25 v
$\text{Sn}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Sn}(\text{s})$	-0.136 v
$\text{Pb}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Pb}(\text{s})$	-0.126 v
$2\text{H}^+(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{H}_2(\text{s})$	0.00 v
$\text{AgCl}(\text{s}) + 1\text{e}^-$	$\rightarrow \text{Ag}(\text{s}) + \text{Cl}^-(\text{aq})$	+0.22 v
$\text{Cu}^{2+}(\text{aq}) + 2\text{e}^-$	$\rightarrow \text{Cu}(\text{s})$	+0.34 v
$\text{I}_2(\text{s}) + 2\text{e}^-$	$\rightarrow 2\text{I}^-(\text{aq})$	+0.53 v
$\text{Ag}^+(\text{aq}) + 1\text{e}^-$	$\rightarrow \text{Ag}(\text{s})$	+0.80 v
$\text{NO}_3^-(\text{aq}) + 4\text{H}^+(\text{aq}) + 3\text{e}^-$	$\rightarrow \text{NO}(\text{g}) + 2\text{H}_2\text{O}(\text{l})$	+0.96 v
$\text{Br}_2(\text{l}) + 2\text{e}^-$	$\rightarrow 2\text{Br}^-(\text{aq})$	+1.07 v
$\text{O}_2(\text{g}) + 4\text{H}^+(\text{aq}) + 4\text{e}^-$	$\rightarrow 2\text{H}_2\text{O}(\text{l})$	+1.23 v
$\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + 14\text{H}^+(\text{aq}) + 6\text{e}^-$	$\rightarrow 2\text{Cr}^{3+}(\text{aq}) + 7\text{H}_2\text{O}(\text{l})$	+1.33 v
$\text{Cl}_2(\text{g}) + 2\text{e}^-$	$\rightarrow 2\text{Cl}^-(\text{aq})$	+1.36 v
$\text{MnO}_4^-(\text{aq}) + 8\text{H}^+(\text{aq}) + 5\text{e}^-$	$\rightarrow \text{Mn}^{2+}(\text{aq}) + 4\text{H}_2\text{O}(\text{l})$	+1.52 v
$\text{H}_2\text{O}_2(\text{aq}) + 2\text{H}^+(\text{aq}) + 2\text{e}^-$	$\rightarrow 2\text{H}_2\text{O}(\text{l})$	+1.77 v
$\text{F}_2(\text{g}) + 2\text{e}^-$	$\rightarrow 2\text{F}^-(\text{aq})$	+2.87 v
$2\text{H}_2\text{O}(\text{l}) + 2\text{e}^-$	$\rightarrow \text{H}_2(\text{g}) + 2\text{OH}^-(\text{aq})$	-0.83 v

Using the table of Standard Reduction Potential complete the following problems.

20. Which of the following species is the strongest oxidizing agent, MnO_4^- (in acidic solution), $\text{Br}_2(l)$, or $\text{Ca}^{2+}(aq)$?

21. Will aluminum displace Cu^{2+} ion from an aqueous solution of $\text{Cu}(\text{NO}_3)_2$?

22. Will Mg displace Sn^{2+} from an aqueous solution of tin (II) nitrate?

