## CHEM 121 - Worksheet 30 - Fall 2015

Directions: Complete this worksheet prior to coming to class.

Balance each redox reaction (in questions 1-5 and in acidic solution) by the second redox balancing method only. Show all of your work.

1) 
$$Mn^{2+} + BiO_3^- \rightarrow MnO_4^- + Bi^{3+}$$

2) 
$$MnO_4^- + S_2O_3^{2-} \rightarrow S_4O_6^{2-} + Mn^{2+}$$

3) 
$$ClO_3^- + Cl^- \rightarrow Cl_2 + ClO_2$$

4) 
$$P + Cu^{2+} \rightarrow Cu + H_2PO_4^-$$

5)  $PH_3 + I_2 \rightarrow H_3PO_2^- + I^-$ 

Balance the following reactions (in questions 6-10) using the second method of redox balancing only – these reactions are in alkaline conditions.

6)  $MnO_4^- + C_2O_4^{2-} \rightarrow MnO_2 + CO_2$ 

7) 
$$Cu(NH_3)_4^{2+} + S_2O_4^{2-} \rightarrow SO_3^{2-} + Cu + NH_3$$

8) 
$$Cr_2O_7^{2-} + Hg \rightarrow Hg^{2+} + Cr^{3+}$$

9) 
$$O_2 + Cr^{3+} \rightarrow H_2O + Cr_2O_7^{2-}$$

10) 
$$Pb^{2+} + IO_3^- \rightarrow PbO_2 + I_2$$