Friday worksheet 2 – writing balanced redox half equations and overall equations.

1. Write the balanced half equations for the reactions below taking place in an acid solution. That means use H^+ when balancing for hydrogens. States not required

   a. $SO_4^{2-} \rightarrow SO_2$

   b. $MnO_2 \rightarrow Mn_2O_3$

   c. $MnO_4^- \rightarrow MnO$

   d. $TeO_3^{2-} \rightarrow Te$

   e. $N_2O_4 \rightarrow NO_3^-$

2. Balance the following ***unbalanced*** redox reactions taking place in acidic solutions, by first writing the balanced reduction and oxidation half equations and then the overall balanced equation by first adding the two half reactions and cancelling for electrons. States not required. The first one is done for you

   a. $H_2O_2 + Cr_2O_7^{2-} \rightarrow O_2 + Cr^{3+}$

   => $6e + 14H^+ + Cr_2O_7^{2-} \rightarrow 2Cr^{3+} + 7H_2O$ ----- reduction

   => $H_2O_2 \rightarrow O_2 + 2H^+ + 2e$ ------- oxidation

   => reduction + 3 X oxidation = overall

   => $8H^+ + Cr_2O_7^{2-} + 3H_2O_2 \rightarrow 2Cr^{3+} + 7H_2O + 3O_2$ ---- balanced overall redox reaction

   b. $TeO_3^{2-} + N_2O_4 \rightarrow Te + NO_3^-$

   c. $ReO_4^- + IO^- \rightarrow IO_3^- + Re$

   d. $PbO_2 + I_2 \rightarrow Pb^{2+} + IO_3^-$

   e. $As \rightarrow H_2AsO^{4-} + AsH_3$

3. For each of the balanced overall reactions you have given for question 2. above identify the oxidant and the reductant. Note- the oxidant takes part in the reduction reaction while the reductant takes part in the oxidation reaction. The first one is done for you.

   a. $Cr_2O_7^{2-}$ ----- oxidant, H_2O_2 -----reductant

   b.

   c.

   d.

   e.