Practice Balancing REDOX equations Chem 111 (2012)

Balance the equation for this reaction

$NH_3(g) + O_2(g) \rightarrow NO(g) + H_2O(g)$

Balance the equation for this reaction in acidic solution.

(a) $Fe^{2+}(aq) + MnO_4^-(aq) \rightarrow Fe^{3+}(aq) + Mn^{2+}(aq)$
(b) $UO^{2+}(aq) + Cr_2O_7^{2-}(aq) \rightarrow UO_2^{2+}(aq) + Cr^{3+}(aq)$
(c) $S_2O_3^{2-}(aq) \rightarrow S(s) + SO_2(g) + H_2O(l)$

Balance the equation2 for this reaction in basic solution.

(a) $S(s) + OCl^-(aq) \rightarrow SO_3^{2-}(aq) + Cl^-(aq)$
(b) $MnO_4^-(aq) + SO_3^{2-}(aq) \rightarrow MnO_2(s) + SO_4^{2-}(aq)$

Identify the Oxidizing and Reducing agent

(a) $H_2O_2(aq) + 2\,Fe^{2+}(aq) + 2\,H^+(aq) \rightarrow 2\,H_2O(l) + 2\,Fe^{3+}(aq)$
(b) $5\,H_2O_2(aq) + 2\,MnO_4^-(aq) + 6\,H+(aq) \rightarrow 8\,H_2O(l) + 2\,Mn^{2+}(aq) + 5\,O_2(g)$
(c) $4\,Au(s) + 8\,CN^-(aq) + O2(g) + 2\,H_2O(l)$ ¡ $4[Au(CN)_2]$-(aq) + 4 OH-(aq)

Complete and balance the half-equations.

(a) $SO_3^{2-} \rightarrow S_2O_3^{2-}$ (acidic solution)
(b) $HNO_3 \rightarrow N_2O(g)$ (acidic solution)
(c) $Al(s) \rightarrow Al(OH)_4^-$ (basic solution)

Balance the equations for redox reactions occurring in acidic solution.

(a) $UO^{2+} + NO_3^- \rightarrow UO_2^{2+} + NO(g)$
(b) $VO_4^{3-} + Fe^{2+} \rightarrow VO^{2+} + Fe^{3+}$
(c) $BrO_3^- + N_2H_4 \rightarrow Br^- + N_2$
(d) $MnO_4^- + I^- \rightarrow Mn^{2+} + I_2(s)$

Balance the equations for redox reactions in basic solution.

(a) $MnO_2(s) + ClO_3^- \rightarrow MnO_4^- + Cl^-$
(b) $Fe(OH)_3(s) + OCl^- \rightarrow FeO_4^{2-} + Cl^-$
(c) $ClO_2 \rightarrow ClO_3^- + Cl^-$
(d) $C_2H_5OH(aq) + MnO_4^- \rightarrow C_2H_3O_2^- + MnO_2(s)$

The titration of 5.00 mL of a saturated solution of sodium oxalate, $Na_2C_2O_4$, at 25°C requires 25.8 mL of 0.02140 M $KMnO_4$ in acidic solution. What mass of $Na_2C_2O_4$ in grams, would be present in 1.00 L of this saturated solution?

$C_2O_4^{2-} + MnO_4^- \rightarrow Mn^{2+} + CO_2(g)$ (not balanced)