

Chem 1062

Note Title

4/21/2009

$$\Delta G < 0 \Rightarrow \Delta G = (-) \quad \text{spontaneous}$$

$$\Delta G > 0 \Rightarrow \Delta G = (+) \quad \text{nonspontaneous}$$

$$\Delta G = 0 \quad \text{equilibrium}$$

$$\Delta G_{\text{rxn}} = \Delta G_{\text{rxn}}^{\circ} + RT \ln Q$$

$$\downarrow \quad \text{Assume} \quad \downarrow$$

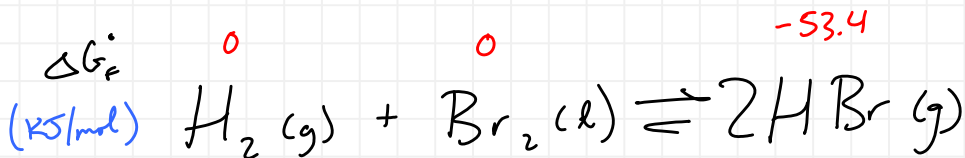
$$Q = K$$

$$0 = \Delta G_{\text{rxn}}^{\circ} + RT \ln K$$

$$\Delta G_{\text{rxn}}^{\circ} = -RT \ln K$$

p. A-8

$$\text{Find } \Delta G_{\text{rxn}}^{\circ}, K \text{ @ } 25^{\circ}\text{C} \leftarrow 298\text{K}$$



$$\Delta G_{\text{rxn}}^{\circ} = \sum n \Delta G_f^{\circ} (\text{prod}) - \sum n \Delta G_f^{\circ} (\text{reactants})$$

$$= (2 \text{ mol}) \left(-53.4 \frac{\text{kJ}}{\text{mol}} \right) - (0 + 0)$$

$$\Delta G_{\text{rxn}}^{\circ} = \boxed{-106.8 \text{ kJ}} \times \frac{10^3 \text{ J}}{1 \text{ kJ}} \quad \text{spontaneous process}$$

$$-\frac{\Delta G_{\text{rxn}}^{\circ}}{RT} = \ln K = K$$

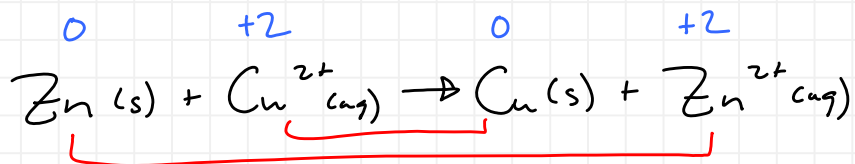
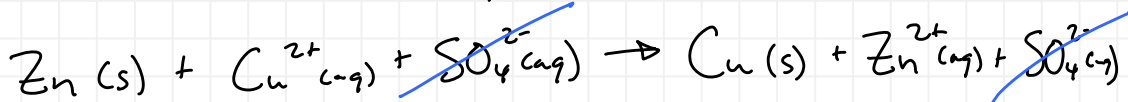
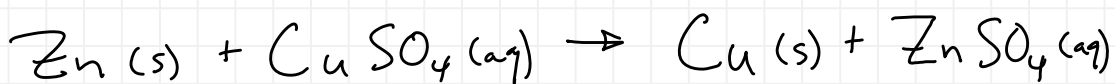
$$R = 8.314 \frac{\text{J}}{\text{mol} \cdot \text{K}}$$

$$K = e^{-\frac{\Delta G^\circ}{RT}} = e^{+\frac{106.8 \times 10^3 \text{ J}}{(8.314 \text{ J/mol}\cdot\text{K})(298\text{K})}}$$

$$= e^{43.11}$$

$$K = 5.3 \times 10^{18}$$

Big K \Rightarrow product-favored

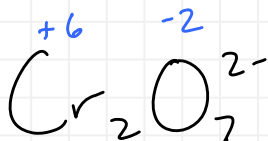
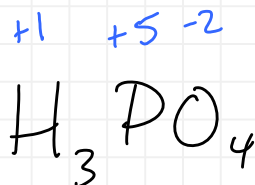
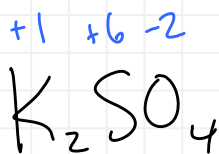
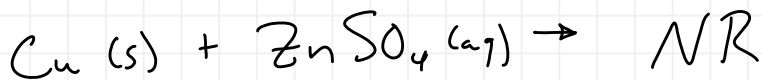


OIL RIG
LEO GER

Zn gets oxidized
Cu²⁺ gets reduced

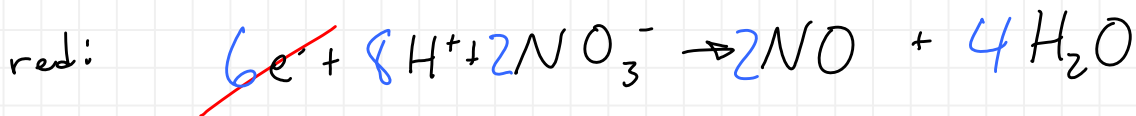
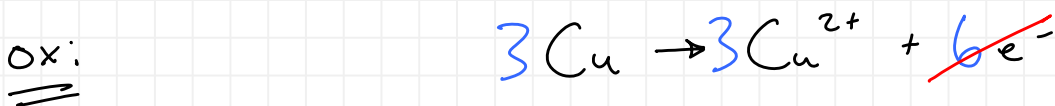
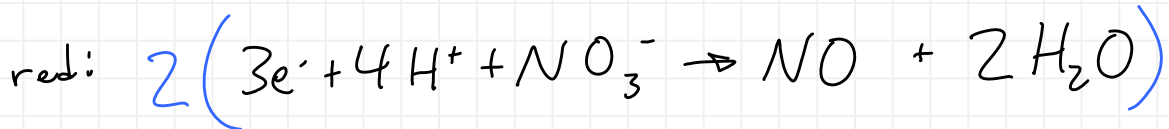
oxidizing agent is Cu²⁺ (aq)

reducing agent is Zn (s)



$$+12 + -14 = -2$$

Balance this equation in acidic solution



Balance the following equation in basic solution:

