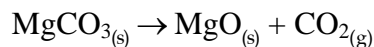


## Chemistry 102 Study Questions

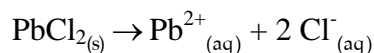
1. The reaction



is not spontaneous at room temperature but becomes spontaneous at higher temperatures.

- Calculate the temperature at which this reaction becomes spontaneous.
- Calculate the partial pressure of Carbon Dioxide at equilibrium in a container that is 25°C above the temperature you calculated in part a.

2. Is the reaction



spontaneous at 35.0°C when  $[\text{Pb}^{2+}] = 1.4 \times 10^{-5} \text{ M}$  and  $[\text{Cl}^{-}] = 2.6 \times 10^{-6} \text{ M}$ ?

3. A cell is made from the  $\text{Fe}^{3+}|\text{Fe}$  and the  $\text{MnO}_4^-|\text{Mn}^{2+}$  half cells.

- Calculate  $E_{\text{cell}}^{\circ}$ .
- Write the overall cell equation.
- Write the cell notation for the cell.
- Calculate  $K_{\text{eq}}$
- Calculate  $E_{\text{cell}}$  when  $[\text{Fe}^{3+}] = 0.10 \text{ M}$ ,  $[\text{MnO}_4^-] = 0.25 \text{ M}$ ,  $[\text{Mn}^{2+}] = 1.50 \text{ M}$  and the pH is 1.67 at 298 K.