**Name:** _____

CHM 112 EXAM 3 Spring 2014

Short Answer

1. Copper plated wooden ships hulls were protected from corrosion by iron anodes. Write half reactions to explain the process of anodic protection. What is the volyage of this system.

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2. Would you expect this reaction to be spontaneous at low temperatures, high temperatures, all temperatures or not at all? Explain.
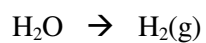
$PCl_3(g)$ + $Cl_2(g)$ $\rightarrow$ $PCl_5(g)$ $\triangle H = -87.9$ kJ

.

3. Determine $\triangle H^0$ and $\triangle S^0$ for the following reaction at 298K. Then determine $\triangle G^0$ in two different ways and compare the results.

$$CS_2(l) \; + \; 3\,O_2(g) \quad \longrightarrow \quad CO_2(g) \; + \; 2\,SO_2(g)$$

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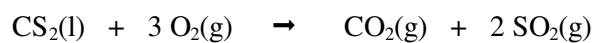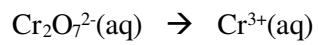
4. If E^o_{cell} is less than zero, is a spontaneous reaction impossible regardless of conditions? Explain.
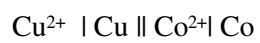
.

5. Balance, in base;

$$H_2O \; \rightarrow \; H_2(g)$$

.

6. Balance, in acid;

   $Cr_2O_7^{2-}(aq)$ → $Cr^{3+}(aq)$

   .

   .

7. For the cell;

   Cu^{2+} | Cu || Co^{2+}| Co

   Calculate at (298K);

   E^0

   ΔG^0

   K

   .

8. Is this reaction spontaneous as written? Explain.

$I_2(s)$ + 2 Br$^-$(aq) → 2 I$^-$(aq) + Br$_2$(l)

.

9. Calculate the voltage;

Sn^{2+}(aq)(0.2M) + Cu^{2+}(aq)1M → Sn^{4+}(aq)(0.5M) + Cu(s)

.