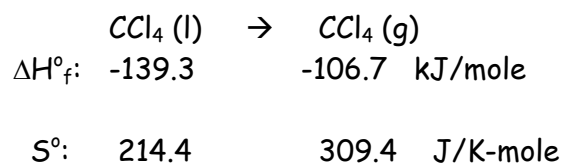


CHM 102 EXAM IV

Show all calculations with units and correct significant figures. Write in complete sentences. Turn in your take-home questions at the end of the exam. **GOOD LUCK!!!**

1. Consider the vaporization of tetrachloromethane. Support with thermodynamic calculations using the data given below. (15)



Is the vaporization spontaneous at 25°C?

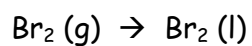
The equilibrium temperature for this process is the boiling point of CCl_4 . Calculate it.

Why is this process endothermic?

2. Strontium as ^{90}Sr decays by beta emission with a half-life of 28 years. Write the decay reaction. (10)

If the ^{90}Sr was mixed with a catalyst, what would happen? Explain.

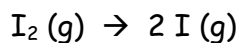
3. Consider the processes given below and CIRCLE the sign and give a reason for to support your choice. (30)



Reason

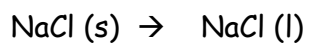
$$\Delta H > 0 \quad \Delta H < 0$$

$$\Delta S > 0 \quad \Delta S < 0$$



$$\Delta H > 0 \quad \Delta H < 0$$

$$\Delta S > 0 \quad \Delta S < 0$$



$$\Delta H > 0 \quad \Delta H < 0$$

$$\Delta S > 0 \quad \Delta S < 0$$

4. An electrolytic cell is set up to plate chromium metal from a Cr^{+3} solution. (15)
What the half-cell for the plating of chromium.

If the cell operated at 0.17 amp for 37.2 minutes, how much chromium plated out?

Did this cell require a power source to function?

YES

NO