

## CHEM NOTES - Spontaneous Reactions

Name: \_\_\_\_\_

I. Factors that determine the direction of a spontaneous change.

1. The tendency to change to a condition of \_\_\_\_\_ energy
2. The tendency to change to a condition of \_\_\_\_\_ randomness

II. Energy Changes

1. The tendency in nature favors the exothermic reaction in which the heat of reaction ( $\Delta H$ ) or the \_\_\_\_\_ is negative.

III. Entropy Changes

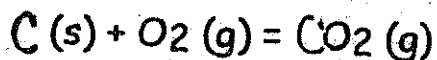
1. Entropy is a measure of the disorder of a system.
2. The solid phase is more ordered than the liquid phase and the liquid phase is more ordered than the gaseous phase.
3. The more random a system, the \_\_\_\_\_ the entropy.
4. High entropy is favored by high temperatures. Higher temps increase the kinetic energy and thus increase randomness.
5. Entropy is represented by letter: \_\_\_\_\_

Base your answers on Chart **I** (at 298 K and 1 atm)

1. List 3 compounds that are formed from their elements by an exothermic reaction. \_\_\_\_\_

2. List 3 compounds that are formed from their elements by an endothermic reaction. \_\_\_\_\_

3. Base your answers to the following questions on the equation:



- a) Is the reaction exothermic or endothermic? \_\_\_\_\_
- b) Does the entropy increase or decrease? \_\_\_\_\_
- c) Is the reaction spontaneous? \_\_\_\_\_

4. Which compound releases the most energy when it is formed from its elements at 298 K and 1 atm? \_\_\_\_\_

5. Which compound on Chart **I** is most stable? \_\_\_\_\_