

Chapter 23- Thermodynamics

23.1 Spontaneous Processes

Define a spontaneous process.

Give an example of a spontaneous process.

Does the study of thermodynamics include rates of reactions?

23.2 Enthalpy

Review- What is enthalpy?

How is enthalpy of a given process an indicator of spontaneity?

Spontaneous processes are mostly _____.

Give an example of an endothermic spontaneous reaction.

23.3 Entropy

What is true of all spontaneous endothermic processes?

What is entropy?

Write the equation used to solve for the change in entropy of a given process.

What is the significance of the following?

ΔS is positive-

ΔS is negative-

List 4 ways to increase the entropy of a given process:

1)

2)

3)

4)

What is the 2nd Law of Thermodynamics (p.758)?

Write equation 5 on page 758 and explain its significance.

Explain the four “cases” in Figure 23-13 on page 760.

(Hint: Read the last 2 paragraphs of section 23.3 on pages 759 and 760.)

1)

2)

3)

4)

23.4 Gibbs Free Energy

Write the Gibbs free energy equation (Eq. 7) on page 761 and explain its significance.

In reference to ΔG , list three simple rules used to predict reaction spontaneity.

1)

2)

3)

What is ΔG° when K_{eq} is

1) $\ll 1$

2) $\gg 1$

3) $= 1$

Develop a definition of free energy by reading the 2nd paragraph on page 763.