

Chapter 5 – Thermochemistry (Syllabus)

Chemistry: The Central Science

1. Read pgs. 163-211 noting the terms in bold and italics. Read and take notes on 5.1-5.2 before our next class.
2. Intro. & 5.1 (The Nature of Energy):
 - Pay close attn. to the terms & concepts in this section. They set the foundation for the “chemical” applications later in the chapter.
 - Just read through the “physics” equations, but we will not focus on these calculations at this time (Those are for Physics class).
 - What are some units for energy?
 - The terms “system” & “surroundings” are important concepts to understand for later.
3. 5.2 (The First Law of Thermodynamics):
 - One of the most important laws in science
 - Pay attn. to the “+ & -” signs in **all** of the equations.
 - Endo- vs. Exothermic rxns.
 - What are “state functions”?
4. 5.3 (Enthalpy) & 5.4 (Enthalpies of Reaction):
 - ✓ It’s “pretty much” just heat flow.
 - ✓ When is ΔH positive? negative?
 - ✓ Pay close attn. to the 3 guidelines when using thermochemical eqns. & enthalpy diagrams.
5. 5.5 (Calorimetry):
 - We did “much” of this last year. The major equation should look familiar.
 - Again, watch your signs (& units)!!
 - What are the 2 types of calorimeters?
6. 5.6 (Hess’s Law) & 5.7 (Enthalpies of Formation):
 - “Really” understand this law!! We’ll be using it in later chapters & it’s an excellent AP test item.
 - The math is easy (+ & -), but it’s sometimes tough to figure out how to manipulate the equations in the problems.
 - What is the standard enthalpy of formation of an element? Explain.
 - Equation 5.31 is the most important equation in this section.
7. 5.8 (Bond Enthalpies):
 - Strength of bonds: Table 5.4
 - ΔH_{rxn} can be estimated from bond energies
8. 5.9 (Foods and Fuels): Read through. This includes “mostly” qualitative applications of enthalpy.
9. Labs:
 - ❖ Lab 5-5: Calorimetry and The Specific Heat of a Metal
 - ❖ LabQuest 13: Heat of Neutralization and Hess’s Law
10. Chapter 5 Exercises:
 - ✓ You are responsible for ALL of the “Visualizing Concepts” & “Exercises” at the end of Ch. 5.
 - ✓ Remember to start with the Focus Problems (given below) and then progress from there, ending with the “Additional & Integrative Exercises”.
 - ✓ Ch. 5 Focus Problems:
 - ◇ Visualizing Concepts & Exercises: #'s 3, 4, 13, 17, 22, 25, 30, 37, 39, 43, 47, 51, 53, 55, 57, 65, 69, 71, 73, 77, 81, 83, 93, & 95
 - ◇ Additional Exercises: #'s 105, 106, 107, 109, & 115
 - ◇ Integrative Exercises: #'s 118, 119, 120, 123, & 125
11. Test: Chapter 5 test will be in about 2 weeks.