

This list is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test.

+ denotes calculations

Chemical Compositions

- + Percent Composition
- + Empirical Formulas
 - o Percent to mass, mass to mole, divide by small, multiply by whole!
- + Determining Molecular Formulas
 - o Use empirical formula and molecular weight to find the multiplier for your coefficients
- + Combustion Analysis with things such as C, H, O, N
 - o Just empirical formula calculations where your numbers are from lab data and you have to work to find which numbers to use!
 - o Remember to find the mass of the obvious elements first, then subtract from total mass to find grams of the one you can't find easily (usually Oxygen).
 - o Remember to be careful to use single atom masses and numbers, not diatomics!
 - o Careful with elements found in separate experiments (usually Nitrogen)!

Gas Laws

- Conceptual items
 - o Properties of Gases
 - o KMT theory assumptions
 - o Why we use kelvins
 - o Pressure units and STP values
 - o Kinetic Energy and Temperature relationship
 - o How mass affects the speed of gases
 - o Ideal versus Real Gases
 - o Diffusion and Effusion
- + Basic Gas Law Equations
 - o Know equations and be able to do calculations with them
 - Boyle's
 - Charles'
 - Gay-Lussac's
 - Avogadro's
 - Combined
 - o Which equations are direct or indirect relationships
 - o Identify graphs of each gas law equation
- + Ideal Gas Law Equation
 - o Ideal Gas Constant
 - o Calculating the molar mass by rearranging the Ideal Gas Law
 - o Calculating density by rearranging the Ideal Gas Law
- + Dalton's Law of Partial Pressures
 - o Regular Partial Pressure Problems
 - o Problems using more than one equation
 - Using Boyle's Law calculations to find the Pressure values needed to do a Partial Pressure calculation
 - o Collecting gas over water
 - Dry vs Wet Gas concept
 - Don't forget to subtract out the wet gas!

- + Gas Stoichiometry
 - Remember this is JUST stoichiometry! Sometimes you just need an equation instead of a conversion factor! Use your “Mole Highway” just like always!
 - Sometimes you can use Molar Volume as a shortcut if you are at STP

Thermochemistry

- Conceptual information
 - Definitions from chapter
 - Types of heat transfer
 - 1st Law of Thermodynamics
 - Endo vs. Exothermic including reaction diagrams
 - Meaning of all variables in the equations used this chapter
- + $Q = mC\Delta T$
- + Calorimetry
 - $Q = -Q$
- + $Q = mL$ calculations
 - Understand *why* phase changes need a new equation
 - Remember L can be positive or negative
- + Heating/Cooling Curve calculations
 - Sketching a graph with start/end points can be very helpful!
- + Mixed Phase Calorimetry
 - Sketching a graph and labeling everything is very helpful!
 - Can either do $Q = -Q$, or you can use the $Q + Q = 0$ trick to help eliminate double negatives if it helps your algebra (or sanity – ha!)
- Phase Diagrams
 - Phase change lines
 - Triple point
 - Critical point
 - Supercritical fluid
 - Identifying information when given things like a specific temperature and/or pressure
 -
- + Molar Heat Calculations
 - Either converting moles to grams before doing a thermo calculation, or using C or L values that are in moles instead of grams
- + Heat of Reaction Calculations
 - Back to dimensional analysis again!