# **Study Guide: Changes in State & Gas Laws (Chapters 10 &11)**

You should begin by reviewing all vocabulary words, tables, and figures in both chapters!!

You should:

* Be able to state the basic assumptions of the kinetic molecular theory
* Understand the properties of an ideal gas and what types of molecules are likely to behave most ideally in the gas phase.
* Understand the fundamental properties of solids, liquids, and gases — what makes each different from the others (Behavior/Particle Arrangement)
* Understand how to do calculations of heat absorbed or given off during a phase change - using the molar enthalpy of fusion or the molar enthalpy of vaporization and the number of moles or grams of the substance that is changing state.
* Understand the effect of intermolecular forces on the vapor pressure of a liquid, and on its boiling point.
* Understand the role of intermolecular forces in determining the state of a substance at a given temperature and pressure
* Be able to describe the graph of a heating or cooling curve (Temperature vs. Total Heat Added for a given substance) — what states of matter are present in each part of the curve, why some parts of the curve are sloped and some are flat, which features of the curve represent the Heat of Fusion and the Heat of Vaporization (Molar Enthalpy of Fusion and Vaporization)
* Be able to explain the relationship between equilibrium and changes of state
* Be able to interpret phase diagrams
* Define pressure, know units of pressure, be able to convert between units of pressure (Torr, kPa, atm)
* Use Dalton's Law of partial pressures to calculate partial pressure and total pressure, including problems involving collecting a gas over water (by water displacement).
* Know the standard conditions of temperature and pressure (STP) used in gas law problems.
* Use kinetic-molecular theory to explain relationships between gas volume, temperature, and pressure.
* Use the Combined Gas Law to calculate a change in volume, temperature, or pressure for a given sample of gas (with no change in the amount of gas in the sample).
* Use the Law of Combining Volumes and Avogadro's Law to calculate volumes of gaseous reactants or products in reaction stoichiometry problems.
* Know the equation for the Ideal Gas Law and be able to use the Ideal Gas Law to calculate pressure, volume, temperature, or amount of gas when the other three quantities are known (the Gas Constant, R, will be given to you).
* Define standard molar volume and use it to calculate gas masses and volumes.
* Distinguish gaseous diffusion from effusion and the relationship of these to molar mass of the gas.

Review textbook pp. 317-341 and pp.349-378; Review chapter summaries on pp. 343 and 378 in textbook. Review pages to see any new examples and details not used in modeling and practice.

Review lab, notes, modeling and practice, practice problems, review, and all vocabulary words.

\*Remember this is just a guide to help you study for the test\*.