

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

Solutions

- Definitions
 - o Homogeneous solution
 - o Solute
 - o Solvent
 - o Solution
 - o Solubility
 - o Saturated
 - o Unsaturated
 - o Supersaturated
 - o Colloids
 - o Dissolving
 - o Dissociating
 - o Electrolytes
 - o Non-electrolytes
- Solubility
 - o How does the solubility of things change based on their phase?
 - o Using solubility curves
 - Identify based on the curve if it is saturated, unsaturated or super saturated
- “Like Dissolves Like”
 - o Identify what an appropriate solvent/solute combo would be based on polar/non-polar
- + Various ways of calculating the concentration of solutions
 - o Mass Percent/Percent composition
 - o Parts per million
 - o Grams per liter
 - o Mole fraction
 - o Molarity
 - o Making Dilutions

Kinetics

- What is a rate?
- Positive versus negative rates
- Rate affecting factors
 - o Temperature
 - o Concentration
 - o Surface Area
 - o Catalysts
- Collision Theory
 - o What is it?
 - o How do the rate affecting factors relate to it?
- Activation Energy
 - o What is the energy used for?
 - o How is it affected by catalysts
- Reaction Mechanism
 - o Difference between it and the overall reaction
 - o Rate determining step – also known as Slow step
 - Significance of it?
- Using a graph of appearance/disappearance
 - o Identifying which line(s) reactant(s)
 - o Identifying which line(s) products(s)
- + Average Rate and Rate Expressions

- Calculating average rate over a period of time when given data
- Positive for products
- Negative for reactants
- Writing rate expressions
 - Taking into account the stoichiometry
 - Solving for average rate of one chemical when given data on another by using rate expressions
- + Instantaneous Rates
 - Calculate based on drawing a tangent line
- + Rate Laws
 - Write rate laws based on a single step reaction
 - Coefficients are exponents
 - Use data charts to find orders for rate law when it isn't a single step
 - Look for trials to keep all but one substance constant and see how the change to concentration changes the rate and determine order from that
 - Find the overall order of a reaction
 - Use data and a rate law to determine the rate constant
 - Understand what rate constant is, what changes it, etc.

Equilibrium

- What is equilibrium?
 - When rate forward equals rate backwards
 - Rates are the same, not concentrations!
 - Dynamic microscopically, static macroscopically
- Factors that affect equilibrium
 - Concentration
 - Heat
 - Pressure (if gases)
 - Solids, liquids do not affect equilibrium
- Le Chatelier's Principle
 - What is it?
 - Predict shifts due to a stressor
 - Predict increase, decrease, no change, slight increase or slight decrease after the shift
- + Writing Equilibrium Expressions
 - Remember solids and liquids are not included!
 - Equilibrium Constant
 - What is it
 - Factors that affect it
 - How to calculate it
- + K versus Q
 - Which direction will the reaction shift to reach equilibrium
- + Kc, Kp, Ksp
 - What are the differences?
- + ICE Tables to find equilibrium concentrations
 - Without 5% rule
 - Solve for x with algebra, potentially quadratic formula
 - With 5% rule
 - Only if $K < 1$, and K 1000x smaller than initial concentrations better guideline
 - Must always show that 5% rule was a valid assumption when finished!