

Review Topics for Exam 2

Text coverage (with significant focus on items covered in class):

Section numbers correspond the 14th edition of the text

- Chapter 5: All sections
- Chapter 6: All sections
- Chapter 15: Sections 15.1-15.4
- ~~Chapter 7: Sections 7.1-7.7~~

Terms you should understand:

acid	dilute	heat	pH
acidic	dipole-dipole forces	hydrogen bonding	pressure
autoprotolysis	dispersion force	intermolecular force	product
Avogadro's number	elastic collision	ion-dipole interaction	reactant
base	electronegativity	joule	solute
basic	endothermic	molar mass	solution
bond dipole	energy	molarity	solvent
calorie	enthalpy	mole	stoichiometry
conjugate acid	exothermic	neutral	
conjugate base	formula mass	percent composition	

Concepts

1. You should be able to predict the types of intermolecular forces a compound can experience and discuss how intermolecular forces relate to properties like solubility and boiling point.
2. You should be able to balance chemical reactions
3. You should be able to relate mass, moles and number of molecules for molecular species.
4. You should be able to relate the quantities of reactants and products in a reaction using the reaction stoichiometry.
5. You should understand the process of a solute dissolving in a solvent to form a solution.
6. You should be able to relate mass, molar mass and volume to molarity.
7. You should be able to do calculations involving percent by volume and percent by mass.
8. You should be able to explain how the different properties of solids, liquids and gases are related to the motion and spacing of atoms, molecules, or ions.
9. You should be able to identify the differences between ionic and molecular substances and explain why these differences exist.
10. You should be able to classify forces between molecules (intermolecular forces) as dipole-dipole, dispersion, hydrogen bonding, etc.
11. You should be able to explain the effects that intermolecular forces have on the properties of materials, such as boiling point, melting point, solubility.
12. You should understand the basic concepts of the kinetic-molecular theory of gases.
13. You should be able to use the gas laws to find the value of one variable if the other values are given. You will be given the gas laws.
14. You should understand the first and second laws of thermodynamics and their implications.
15. You should understand how temperature impacts the rate of reactions.
16. You should understand how the heat of reaction (enthalpy of reaction) is calculated using bond dissociation energies.
17. You should understand the difference between an exothermic and endothermic process and be able to classify processes as exothermic or endothermic.
18. ~~You should be able to explain the Arrhenius, Bronsted-Lowry, and Lewis definitions of an acid or base.~~
19. ~~You should be able to explain the differences between strong acids and weak acids, as well as strong bases and weak bases.~~
20. ~~You should be able to relate $[H^+]$, $[OH^-]$, pH and pOH to solution composition~~
21. ~~You should understand how pH and pOH relate to whether a solution is acidic, basic or neutral.~~
22. ~~You should be able to write and balance neutralization reactions for acids and bases~~