

## Review Topics for Exam 3

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

Section numbers correspond the 14<sup>th</sup> edition of the text

- Chapter 7: Sections 7.1-7.7
- Chapter 9: Sections 9.1-9.4
- Chapter 10: Sections 10.1-10.6
- Chapter 11: Sections 11.1-11.3, 11.6-11.7

**Terms you should understand:**

acid	chain reaction	double bond	line angle formula
acid anhydride	condensation polymerization	enantiomer	monomer
acidic	condensed formula	fission	neutral
addition polymerization	conjugate acid	functional group	pH
alpha particle	conjugate base	fusion	plasticizer
autoprotolysis	constitutional isomer	gamma ray	positron
base	critical mass	half-life	radical
basic	crosslink	ionizing radiation	radioisotope
beta particle	diastereomer	isomer	stereoisomers
binding energy			

### Concepts

1. You should be able to explain the Arrhenius, Bronsted-Lowry, and Lewis definitions of an acid or base.
2. You should be able to explain the differences between strong acids and weak acids, as well as strong bases and weak bases.
3. You should be able to relate  $[H^+]$ ,  $[OH^-]$ , pH and pOH to solution composition
4. You should understand how pH and pOH relate to whether a solution is acidic, basic or neutral.
5. You should be able to write and balance neutralization reactions for acids and bases
6. You should be able to translate between Lewis structures, condensed formulas and line angle drawings for organic compounds.
7. You should be able to translate a structure to a molecular formula for an organic compound. **You will not need to covert compound names to formulas or formulas to names!**
8. You should understand what functional groups are and how functional group reactivity is used to synthesize organic compounds.
9. You should be able to identify and name functional groups in organic compounds. **I will give you Table 9.4**
10. You should be able to describe the shape and polarity of a region in an organic compound based on its structure.
11. You should know the similarities and differences between addition polymerization and condensation polymerization.
12. You should be able to draw the repeat unit for a polymer given the structure of the monomer(s) and the type of polymerization reaction.
13. You should understand how things like cross-linking, plasticizers, crystallinity, branching and chain length impact the physical properties of a polymer.
14. You should understand why nuclear reactions occur.
15. You should understand what alpha, beta, gamma and positron radiation and how it impacts matter.
16. You should understand how nuclear reactions differ than "typical" chemical reactions.
17. You should be able to balance nuclear reactions.
18. You should understand the concept of half-life.
19. You should understand where the energy comes from in fusion and fission processes.
20. You should understand some potential benefits, dangers, and challenges of nuclear processes.