

Advanced Chemistry O-Chem Exam Objectives

1. What is the octet rule? Know how elements (and ions) are able to achieve and satisfy the octet rule.
2. Be able to distinguish between ionic and covalent bonds. What types of elements (metals or nonmetals) are involved for each type?
3. Understand how electronegativity differences determine bond character.
4. Distinguish between polar and nonpolar bonding and be able to determine the bond character from a structural formula.
5. Write Lewis structures for atoms, ions, polyatomic ions, ionic, and simple molecular compounds. (pages 365-390).
6. Use the VSEPR model to predict the molecular shape of molecules with 2, 3, or 4 atoms around a single central atom.
7. Know the types of bonds that are formed by the carbon atom... single, double, etc.
8. Distinguish between saturated and unsaturated hydrocarbons.
9. Distinguish between alkanes, alkenes, and alkynes.
10. Define structural isomerism (isomers) and indicate how such compounds are similar and/or different.
11. Alkenes exhibit *cis-trans* isomerism (p. 1015). What do *cis* and *trans* refer to?
12. Organic nomenclature... for alkanes, alkenes, alkynes, and aromatic hydrocarbons such as benzene, given name, write the formula, and draw the structural formulas, and vice-versa.
13. Know all of the common function groups listed in table 22.4 on page 1020. You should be able to identify and recognize each in a structural formula.
14. Be able to name simple alcohols and esters.
15. Be able to write out a chemical reaction for the synthesis (preparation) of an ester. (See ester lab).
16. Know the basic types of reactions of alkanes- combustion, substitution and dehydrogenation (1012-1013).
17. Know the basic types of reactions for alkenes and alkynes- such as the addition of hydrogen atoms (hydrogenation) and halogens (halogenation) such as Br and Cl.