

Things to Know for Quiz 8

Chem 30A, Fall 2019

Chapter 9

1. Determine the number of valence electrons for any main-group element.
2. Filled shells of electrons are especially stable.
3. Atoms tend to lose e^- , gain e^- , or share e^- so as to get a filled shell of electrons.
4. Rank atoms in order of size (look at where they are positioned on the periodic table. The closer they are to the upper right corner, the smaller they are. Bottom left corner: larger atoms. [Ch. 9 #81-84])
5. Rank atoms in order of ionization energy. (Higher IE – harder to remove outermost electron.) [Ch. 9 #77-80]
6. Rank atoms in order of metallic character. [Ch. 9 #85-88]

Chapter 10

1. What is a covalent bond?
2. What are single, double, and triple bonds?
3. Memorize the preferred number of bonds for groups 4-7. (There are lots of exceptions.)
4. Draw Lewis structures for molecules or polyatomic ions. Check to make sure the number of valence electrons is correct, and give all atoms octets if possible. [Ch. 10 #47-60, additional problem 1]
5. Boron is often an exception to the octet rule. It often forms just 3 bonds and has no lone pairs. [Ch. 10 # 59-60]
6. Draw resonance structures when needed. (When there is a multiple bond and two or more equivalent locations for it, draw resonance structures.) [Ch. 10 #55-58]
7. Given a large organic molecule's skeleton structure, complete the Lewis structure: give all atoms their normal number of bonds and lone pairs. (No need to count the total number of valence electrons for these.) [Ch. 10, additional problem 2]
8. Determine the shape and bond angles for a molecule or polyatomic ion. (First, you need the Lewis structure.) Draw a 3-dimensional sketch of the molecule. [Ch. 10 #61-76, additional problem 3]
9. Given a large organic molecule's skeleton structure, complete the Lewis structure and state the shape and bond angle around each central atom. [Ch. 10 additional problem 4]
10. What is the difference between a polar bond and a nonpolar bond?
11. Given electronegativity values, state whether a given bond is nonpolar, polar, or ionic. [Ch. 10 #81-84]
12. Determine whether a molecule is polar or nonpolar. (First, you need the Lewis structure and need to figure out the shape.) If it's symmetric, it's nonpolar. Asymmetric molecules are often polar. The key question: do the dipole moments cancel out or not? [Ch. 10 #85-92, additional problem 3]