

Lesson 6: Bonding

text: 86-92, 95-103

handouts on web: Common cations, Common anions

what to know:

- valence shell, valence electrons, Lewis dot symbol, cations, anions, ionic bonds, ionic compounds salts, octet, oxoanions, §3-3
- writing Lewis dot symbols for elements and predicting the charge on binary ions, §3-3
- naming ions and writing formulas for ionic compounds, §3-3
- covalent bonding, covalent compounds (molecules), Lewis structures, octet rule, lone pairs, double bonds triple bonds, resonance structures, §3-4 & §3-5, (omit formal charges)
- how to write Lewis structures for molecules and ions, §3-5
- exceptions to the octet rule

questions:

1. Write Lewis dot symbols for each of the following elements and ions.

C, H, F, Cl, N, S, Al, Na⁺, Br⁻, S²⁻

2. Write chemical formulas for the ionic compounds formed from:

calcium and fluorine

potassium and sulfur

aluminum and oxygen

magnesium and bromine

cesium and sulfate

hydrogen and nitrogen

lithium and phosphorus

sodium and nitrate

barium and phosphate

hydrogen and carbonate

3. Write Lewis structures for: H₂S, CH₄, C₂H₆, N₂H₄, N₂, C₂H₂, NH₃, NH₄⁺, CS₂, SO₃, SO₂, CO₂

4. What is the theoretical basis for the octet rule?

5. How many unshared pairs of electrons are in a molecule of: water? ammonia? methyl alcohol (CH₃OH)?, carbon dioxide?

6. Write the Lewis structures for the resonance forms of CO₃²⁻.