Chapter 4

Covalent Compounds

Covalent Bonding
- Nonpolar
- Polar
- Lewis Structure

Common Bonding Patterns ⟹ Hand Out

Drawing Lewis Structures
- Different Approaches
  - Bonding Patterns
  - Steps
    - e^- count
    - Central atom
    - Mult. bonds
    - Count Octets
    - $\checkmark$ e^- count

Exceptions to Octet Rule

Resonance

Nomenclature of Covalent Compounds
- Binary Covalent
- Acids

VSEPR

Molecular Shape (Geometry)

Electronic

Molecular

Bond angles

~~AXN~~ AEX

Electronegativity & Bond Polarity

Polarity of Molecules

Homework

25, 27, (28), 29, 31, (34), 35, 37, (38), 39, 41,

43, (44), 45, 47, 49, (52), 55, 57, 61, (64),

65, 69, 71, (72), 73, 75, 77, 83, 86, (90), (94)

Activity 10 Lewis Structures

Lewis Structure and Shape Assignment p. 163

Chapter 5

Chemical Reactions

- Chemical Equations
  - Reactants
  - Products
  - Arrows
  - Conditions
  - Coefficients
- Balancing
- The Mole
  - Avogadro's Number
  - Stoichiometric Calculations
    - Mass → Mole
    - Molar Mass
    - Molar ratios
    - Molar Calculations w/ chemical equations
    - Mole bridge
- Percent Yield
  - Theoretical yield

Oxidation/Reduction Redox

- OIL
- RIG
- Half Rxn

Homework

39, 43, 45, (46), 47, (48), 53, 55, 57, 59, 61,
63, 67, 71, 73, 75, 79, (80), 83, 85, (86), 89,
91, 93, (96), (102), 107

Activity 12 - Balancing Chemical Equations

Activity 14 - Mole Worksheet

Activity 7 - Chemical Changes

Activity 8 - Chemical Names and formulas

Chapter 6

Energy Changes, Reaction Rates, and Equilibrium

Energy units — 4.184 kJ / 1 kcal cal Cal

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

$\Delta H = -531$ kcal/mol

Energy changes in reactions

Bond dissociation energy $2H\cdot \rightarrow H_2$ $\Delta H = -104$ kcal/mole — Higher Bond dissociation = Stronger Bond

Enthalpy ΔH — exothermic $\Delta H -$ — endothermic $\Delta H +$

Endo/Exothermic

Energy Diagrams

- Reactants
- Products
- ~~E_A~~
- ~~$\rightleftharpoons$~~
- ~~ΔH~~

$2H_2 + O_2 \rightleftharpoons 2H_2O$ $k = 2.9 \times 10^{82}$

$3O_2 \rightleftharpoons 2O_3$ $k = 2.7 \times 10^{-29}$

Reaction Rates

- [ ], temp
- Catalyst — $= + H_2 \xrightarrow{Pd}$ /

Equilibrium

Equilibrium Constant $k = \dfrac{[C]^c[D]^d}{[A]^a[B]^b}$ $k > 1 \Rightarrow$ $k < 1 \Leftarrow$

Le Châtelier's

- [ ], Pressure — $CH_4 + 3Cl_2 \rightleftharpoons CH_3Cl + 3HCl$

Homework

27, (28), 29, 31, 33, 35, 41, (42), 43, 45, 47, 51,
53, 55, (58), 61, 63, 65, 69, 71, (74), 77, (80),
83, (86), 89, (94), 99