CHM6.141

Review – Final Exam

① **Periodic Table**

- **Element** → { atomic, molecular, phys. states
- Isotopes (z, p, n, e)
- Ions → { IE (first, second...), Affinity, Radius (size)

→ **Trends** → { ✓ oxidizing agents, ✓ Reducing agents

Electron configuration

- atoms
- ions
- valence electrons

② Element / **Compound** / Mixture → - Ionic, - Molecular → ✓ octet Rule, ✓ structure, ✓ Geometry, ✓ polarity, ✓ properties

→ solutions (- molarity, - diluting), electrolytes/nonelectrolytes

③ Composition → { % , mol ratio , formula → { molecular, Empirical

④
- Physical change
- Chemical change = **Reactions**

⑤ Types of Chem. Reactions { precipitation (- solubility, - electrolytes), ✓ neutralisation, ✓ Ox-Red (ox. numbers)

- molecular Eq
- Ionic Eq
- Net Ionic Eq., spect. ions

(6) Stoichiometry

- mole, molar mass
- Balancing
- g → moles
- molarity → moles
- n (gases)
- Thermochemical Eq (ΔH)

} + Limiting reagent!

(7) Heat
WORK
$\Delta E = q + w$

- System, surrounding
- Heat transferring
- Hess Law, ΔH_f°
- Calorimetry

$$q = m \cdot c \cdot \Delta T$$

(8) Spontaneity
Entropy

$$\Delta G = \Delta H - T \cdot \Delta S$$

(9)
- Gas properties
- Gas Laws, Density, STP
- Stoichiometry

$$P \cdot V = n \cdot R \cdot T$$

(10)
- State of matter changes
- Heating/cooling curve, calculations

(11) Solutions —
- ✓ solubility, electrolytes/nonelec
- ✓ Dissociation
- ✓ molarity
- ✓ diluting

$$M = \frac{\#\text{moles}}{V(L)}, \frac{\text{mol}}{L}$$

$$M_1 \cdot V_1 = M_2 \cdot V_2$$

(12) measurement —
- ✓ Reading
- ✓ Sig. Fig.
- ✓ uncertainty
- ✓ precision
- ✓ units

(13)
- Wave Characteristics
- Particle-wave Duality
- Photon Energy

$$E_{ph} = h \cdot \nu = \frac{h \cdot c}{\lambda}$$