5 Benchmark problems  (all involving dimensional analysis)

SHOW YOUR WORK          every number must have a unit(s)

Stoichiometry

-    Use a balanced equation to determine how many grams of a substance are required or formed in a reaction

-   balancing

-    sig. figs., units, molar mass

Gas law stoichiometry

-    What volume of a gas is formed in a reaction

         - gas laws

Solution stoichiometry

-    What volume of a solution will completely react with another solution
-     Molarity   M = mol/L    5 M  translates to 1 liter = 5 moles

Molecular weight measurements

-     Using gas laws
-     Using solution stoichiometry

Enthalpy calculations

-    From bond dissociation energies (break minus make)

2 points of emphasis

Periodic table

- Formulas
- Trends (row and column)
- Group number
- Lewis structures
- Electron configurations
- Polar bonds
- Electronegativity
- Wavelength and frequency calculations

Intermolecular attractive forces

- dipole –dipole
- hydrogen bonds
- IDDI (small, instantaneous dipoles
- Solubility
- Boiling points