PLANT PHYSIOLOGY Lecture 3 - General, Inorganic, & Organic Chemistry

I. What makes chemistry important?
1. Metabolism
2. Water & nutrient relations
3. Growth and development
4. Plant growth regulation
5. Environmental physiology

II. General & inorganic chemistry

A. Units of measure
1. Volume - liter
2. Mass - gram
3. Length - meter

B. Chemical units of measure
1. Molecular weight - mass of a substance that contains one mole (6.022×10^{23}) of atoms (or molecules)
2. Mole - amount of a substance that contains 6.022×10^{23} atoms (or molecules)
3. Molarity - number or moles in one liter of solution

C. Metric system
1. kilo - 10^{3}
2. centi - 10^{-2}
3. milli - 10^{-3}
4. micro - 10^{-6}

D. Composition of elements
1. Atoms - smallest portion of an element
   a) Protons
   b) Electrons
   c) Neutrons

E. Function of atoms
1. Electron excitation (energy)
2. Chemical bonds
   a) Covalent - share electrons
   b) Ionic - charges attract
   c) Hydrogen - weak attraction of H & O

F. Important chemical phenomena
1. Acid / base pH
   a) Equilibrium
   b) Availability & solubility of ions
   c) Buffering capacity
2. Oxidation / reduction
   a) Donate / accept electrons
   The reaction, acetaldehyde + $2H^{+}$ + 2 electrons ====> ethanol, represents a reduction of acetaldehyde

III. Organic chemistry - carbon chemistry, chemistry of life

A. Alkanes, alkenes, and alkynes

B. Alcohols, ethers, and amines

C. Aldehydes, ketones, and carboxylic acids

D. Cyclic compounds and aromatics