GENERAL BOTANY Lecture 5 - Inorganic & organic chemistry

I. Life and chemistry

A. What elements are important in plants?

1.	C	7.	S	13.	Cu
2.	H	8.	Ca	14.	Zn
3.	O	9.	Fe	15.	Cl
4.	P	10.	Mg	16.	Mo
5.	K	11.	B		
6.	N	12.	Mn		

C HOPKNS CaFe Mg B Mn CuZn Cl Mo
C, H, O, N, P, S - 99% of (many) plant's weight
C, H, & O - 96% of Human weight
Water (H_2O) - 75 - 85% of cell weight

B. What makes elements important?

1. **Metabolism**
   a) **Anabolism (build) - photosynthesis**
   b) **Catabolism (break down) - respiration**
2. **Heredity and evolution**
3. **Growth and development**
4. **Growth regulation**
5. **Physiological ecology**

II. General chemistry

A. Composition of elements

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

B. 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**

C. Important chemical phenomena

1. **Acid / base $pH = -\log[H^+]$**
   a) **Equilibrium**
   b) **Availability & solubility of ions $pH = pKa + \log[products/reactants]$**
   c) **Buffering capacity**
2. **Oxidation / reduction**
   a) **Donate / accept electrons**

III. Types of chemistry

A. Inorganic - elements & ions

B. Organic - alkanes, alkenes, alkynes, aromatics, alcohols, amines, etc.

1. **Biochemistry**