

## Biology 2.2

### Organic Chemistry

‘But the day of the Lord will come as a thief in the night; in the which the heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up.’— Second Peter 3:10

#### Organic Chemistry

1. Organic molecules contain C
2. Most are very large and complex
3. Carbon is found in all life forms.

#### Carbon

1. The backbone of biological molecules
2. Six protons and six electrons: 2 inner shell and 4 outer shell. Wants 8 electrons total.
3. Four valence electrons with four potential covalent bonds

#### Carbon bonds

1. Tetrahedral
2. Single, double, triple
3. Rings

#### Hydrocarbons

- a. Catenation describes is the ability of carbon atoms to connect and form long molecular chains.
- b. Alkanes
- c. Alkenes
- d. Alkynes
- e. Aromatics
- f. Saturated v unsaturated.

#### Subgroups

1. Carbonic acid, forms weak organic acids
2. Amines form weak alkaline solution
3. Hydroxyls
4. Carbonyl

#### Amazing facts about organic chemistry and molecules

- a. Carbon, in its pure natural form, occurs as graphite or diamond.
- b. The word carbon means ‘coal.’
- c. Carbon has the highest melting point of all elements, (3,500°C, 3,773 K, 6,332°F).
- d. Carbon forms the hardest naturally occurring substance in the world—diamond.
- e. Carbon is the fifteenth most common element in the Earth’s crust, the fourth most common element in the universe, and the second most common element in the human body.

- f. Around 18 percent of the human body mass is carbon atoms.
- g. The simplest hydrocarbon compound is methane (CH<sub>4</sub>).
- h. Carbon is used to make plastics and carbon steel.
- i. Limonene is the pleasant smelling organic molecule found in most citrus fruits such as oranges and lemons. It is also used as a degreasing solvent.
- j. Beta-carotene is an organic molecule that gives carrots their bright orange color.
- k. Phenylethylamine is an organic molecule produced by the brain to give a sense of well-being or happiness. It is found in chocolate.
- l. Propanethial S-oxide is an organic molecule in onions, contains sulphur, and causes teary eyes.
- m. Acetic acid is an organic molecule that is found in vinegar.
- n. Sodium bicarbonate is an organic molecule that is also called baking soda.
- o. Polyacrylonitrile (PAN) is the organic molecule of carbon fibers, which is fireproof and five times lighter than steel.
- p. Isomers have the same chemical formula but are different molecules.