

Topic 9: Organic Chemistry

1. Organic compounds consist of carbon atoms which bond to each other in chains, rings and networks to form a variety of structures.

- ✓ The source of most hydrocarbons (Table Q) is petroleum, which is a mixture of many hydrocarbons.
- ✓ The hydrocarbons in petroleum are separated from each other by distillation in a "cracking tower," on the basis of boiling points.
- ✓ The greater the molar mass, the higher the intermolecular forces of attraction between molecules. As a result, melting points and boiling points are higher. EX: Octane is a liquid at room temperature, whereas propane (the smaller molecule) is a gas, showing that it has weaker forces of attractions.

2. Organic compounds can be named with the IUPAC system.

- ✓ You should know this system! Use Tables P and Q and R for help!

3. Hydrocarbons are compounds that contain only carbon and hydrogen.

- ✓ Saturated hydrocarbons contain only single carbon-carbon bonds.
- ✓ Unsaturated hydrocarbons contain at least one multiple carbon-carbon bond (double or triple bond).
- ✓ Hydrocarbons tend to be nonpolar molecules, and therefore do not dissolve in water.
- ✓ Hydrocarbons are molecular compounds that do not ionize in water, and are therefore "Non-electrolytes."

4. Organic acids, alcohols, esters, aldehydes, ketones, ethers, halides, amines, amides, and amino acids are categories of organic molecules that differ in their structures.

- ✓ Use Table R for help!
- ✓ Esters are the trickiest to name/draw. Review that one especially!

5. Functional groups give organic molecules distinct physical and chemical properties.

6. Isomers of organic compounds have the same molecular formula but different structures and properties.

7. In a multiple covalent bond, more than one pair of electrons are shared between two atoms. Unsaturated organic compounds contain at least one double or triple bond.

8. Types of organic reactions include: addition, substitution, polymerization, esterification, fermentation, saponification, and combustion.

- ✓ You need to memorize the details of these reactions in order to be able to identify them. The Regents exam likes to go after the esterification reaction especially.

9. Empirical formulas express the simplest ration of elements in a compound.

- ✓ EX: Hexane – Molecular formula = C_6H_{14} & has an empirical formula of C_3H_7 ▪ Propane – Molecular formula = C_3H_8 but has no simpler formula, so C_3H_8 is also its empirical formula