

Organic chemistry is the study of carbon compounds. Biochemistry (and Biology!) is the study of carbon compounds that crawl.

-Mike Adams

**Biology 190
Chapter 4**

Class notes

I. Overview: Carbon—The Backbone of Biological Molecules

- All living organisms

II. Organic chemistry- The study of carbon-based compounds

- Organic molecules -

Question 4.1

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III. Carbon atoms can form diverse molecules.

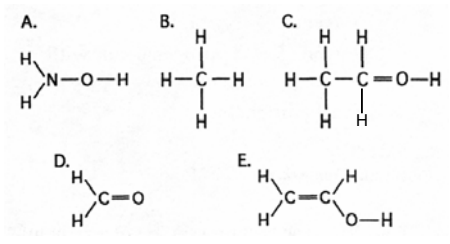
- Carbon-based molecules come in a wide variety of lengths and shapes

III. Carbon atoms can form diverse molecules.

- Carbon has four valence electrons and can form 4 covalent bonds.
- Can covalently bond with many other elements.

Question 4.2

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IV. Hydrocarbons

- Hydrocarbons = molecules that contain ONLY carbon and hydrogen

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IV. Hydrocarbons

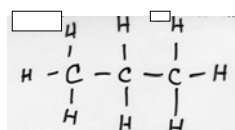
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V. Functional Groups

- No functional group (-H); hydrocarbon

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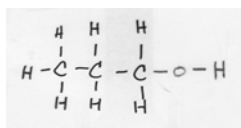
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V. Functional Groups

1. Hydroxyl group (-OH); alcohols

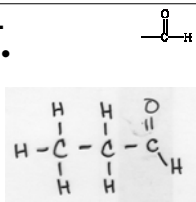
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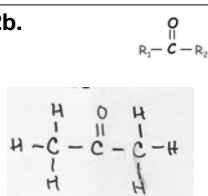
V. Functional Groups

2. Carbonyl group ($\text{C}=\text{O}$); 2 types

2a.



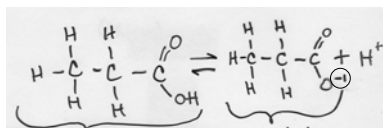
2b.



V. Functional Groups

3. Carboxyl group ($-\text{COOH}$); carboxylic acid

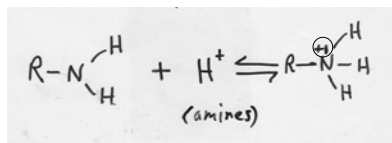
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V. Functional Groups

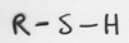
4. Amino group ($-\text{NH}_2$); amines

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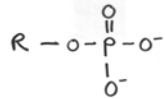


V. Functional Groups

5. Sulfhydryl group; thiols



6. Phosphate group



VI. Functional groups can influence the function of sex hormones.

- Male = testosterone
- Female = estrogens (e.g. estradiol)

Question 4.3

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