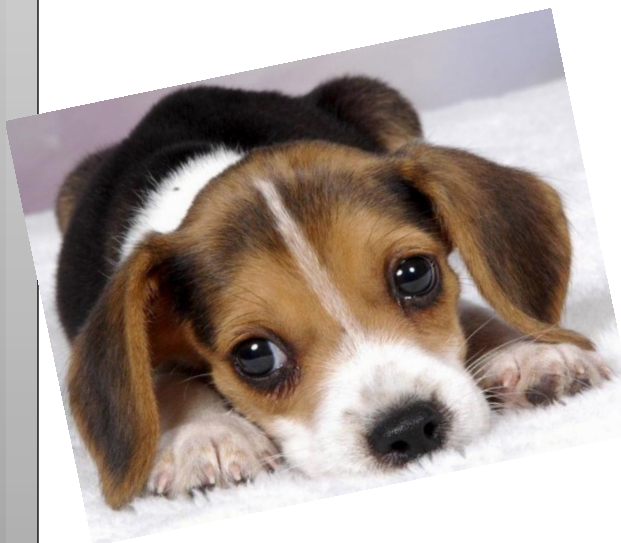


5.3: Organic Compounds





What is an organic compound?

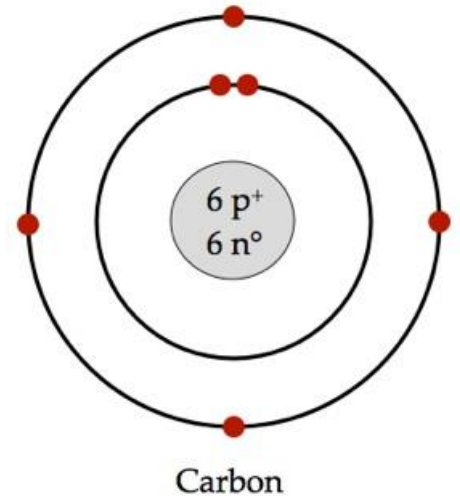
- ❖ Compounds that contain C
- ❖ Found in both **living** and **nonliving** things

What is an inorganic compound?

- ❖ Compounds that do **NOT** contain C

Why is carbon unique?

- ❖ Has **4** electrons in its **valence shell**
- ❖ Has **many** chemical **bonding** possibilities
- ❖ Forms **long chains** which are used in **petroleum** and **plastics**



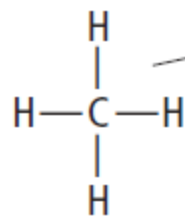
How do we identify organic molecules?

- ❖ **Start** with **C** in their formulas **followed** by **H**
- ❖ This is different from **acids** that **start** with **H**

Models of Organic Compounds

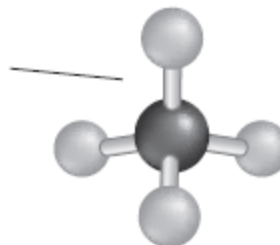


molecular formula



structural formula

Shows a single
covalent bond



ball-and-stick model



space-filling model

What is a hydrocarbon?

- ❖ Compounds that **only** contain **H** and **C**
- ❖ Hydrocarbon **examples** starting from the **simplest**
 - ❖ methane (CH₄)
 - ❖ ethane (C₂H₆)
 - ❖ propane (C₃H₈)
 - ❖ butane (C₄H₁₀)
 - ❖ pentane (C₅H₁₂)
- ❖ **Flammable** and some are **liquids** at **room** temperature

What are alcohols?

- ❖ **Organic** compounds containing **C**, **H** and **O**
- ❖ Alcohols **examples** starting from the **simplest**
 - ❖ methanol (CH_4O)
 - ❖ ethanol ($\text{C}_2\text{H}_6\text{O}$)
 - ❖ isopropyl alcohol ($\text{C}_3\text{H}_8\text{O}$)
- ❖ Alcohols are very **good solvents** (they dissolve other substances).
- ❖ Alcohols are generally **very flammable**.

Table 5.7 Comparing Formulas of Organic Compounds and Inorganic Compounds

Organic: Must Contain Carbon		Inorganic Containing Carbon
CH_4	methane (a hydrocarbon)	CaCO_3 , Na_2CO_3 (carbonates)
$\text{CH}_3\text{CH}_2\text{OH}$	ethanol (an alcohol)	Al_4C_3 , SiC (carbides)
$\text{C}_6\text{H}_5\text{COOH}$	benzoic acid (an organic acid)	CO , CO_2 (oxides)
$\text{K}_2\text{HC}_6\text{H}_5\text{O}_7$	potassium citrate (an organic salt)	Inorganic Not Containing Carbon
$\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$	caffeine (a stimulant)	FeCl_2
$\text{CH}_3-(\text{CH}_2)_n-\text{CH}_3$	polyethylene (a plastic) where $n = 5000$ and the CH_2 unit repeats about 5000 times	$(\text{NH}_4)_2\text{SO}_3$
		PBr_3