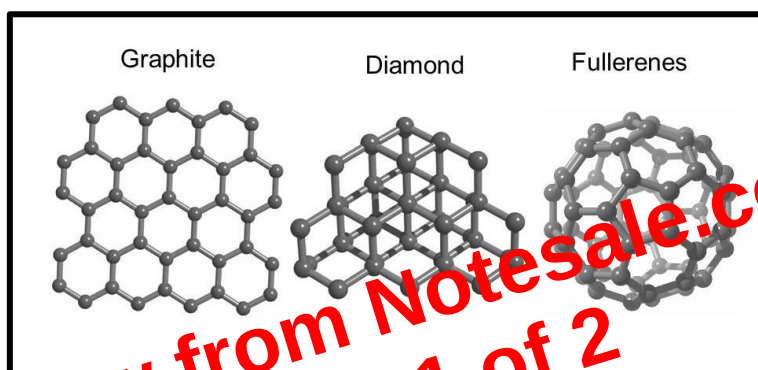


Organic Compounds, Hydrocarbons, Alkyl and Aryl Groups

- Organic chemistry is a branch of chemistry specialising in carbon-containing compounds
 - Carbon is everywhere and in most things
 - Carbon is essential for all life, for example:
 - **CO₂ in the blood**
 - **CO₂ in the air, absorbed by plants and animals**
 - **Carbon based fossil fuels** used for energy production
- Carbon can be arranged in a number of ways:
 - **Carbon atoms each bonded covalently to 4 other carbon atoms produces diamond**
 - This produces a very strong 3D lattice
 - **Carbons that are each bonded to 3 other carbons produces graphite**
 - This is a much weaker structure as they are arranged in sheets
 - **Carbon that is bonded to 3 other carbons can also form fullerene when it rolls into a dome shape**
 - The following is a diamond structure compared to a graphite structure and a fullerene structure:



- All organic compounds contain 2 things:
 - **Functional Groups**
 - These are more complicated parts of the compound which add functionality
 - **Hydrocarbons**
 - These are made of hydrogen and carbon and can be put into 3 groups based on the nature of the covalent bonds between them:

$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{H} \end{array} $	$ \begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{H} \end{array} $	$\text{H}-\text{C}\equiv\text{C}-\text{H}$
Only one single carbon-carbon bond	At least one double carbon bond	At least one triple carbon bond
AlkANE	AlkENE	AlkYNE

- To name a hydrocarbon compound you need to know:
 - **How many carbons are in the longest unbroken chain**
 - If its **saturated** or **unsaturated**
 - Finally, the **shape** of the compound
- The **number of carbons in the longest unbroken chain** gives the **prefix** for the compounds name