

The videos also cover the concept of functional groups, which are groups of atoms that are bonded to a carbon skeleton and give a compound its specific chemical properties. Examples of functional groups include alcohols, amines, and carboxylic acids.

For instance, consider the compound ethanol ($\text{C}_2\text{H}_5\text{OH}$), which is an alcohol. The functional group in ethanol is the $-\text{OH}$ group, which is bonded to a carbon skeleton consisting of two carbon atoms bonded together in a chain. This $-\text{OH}$ group gives ethanol its characteristic properties as an alcohol, such as its ability to be used as a solvent and its ability to be converted into other compounds through chemical reactions.

In summary, covalent bonding in carbon compounds involves the formation of strong and stable bonds between carbon atoms, allowing for the formation of long chains and branched structures through catenation and structural isomerism. Additionally, functional groups play a crucial role in determining the specific physical and chemical properties of carbon compounds.