

- **Melting and Boiling Points:** The melting and boiling points of carbon compounds depend on the strength of the intermolecular forces between the molecules. In general, larger and more polar molecules have higher melting and boiling points.
- **Solubility:** The solubility of carbon compounds in a particular solvent depends on the polarity of both the compound and the solvent. Like dissolves like - polar compounds dissolve in polar solvents, and nonpolar compounds dissolve in nonpolar solvents.

3. Chemical Properties of Carbon Compounds

Carbon compounds undergo a variety of chemical reactions, including:

- **Combustion:** Carbon compounds can react with oxygen to produce carbon dioxide and water, releasing energy in the form of heat and light.
- **Hydrogenation:** Saturated hydrocarbons can react with hydrogen in the presence of a catalyst to produce unsaturated hydrocarbons.
- **Halogenation:** Carbon compounds can react with halogens (such as chlorine and bromine) to produce halogenated compounds.
- **Substitution and Addition Reactions:** Carbon compounds can undergo substitution reactions, where one atom or group of atoms is replaced by another, or addition reactions, where atoms or groups of atoms are added to the molecule.

To illustrate these properties, let's consider the example of propane, a hydrocarbon with the molecular formula C_3H_8 . Propane is a gas at room temperature and can be liquefied under pressure. It is highly flammable and can be used as a fuel for heating and cooking. When