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CHE 2060: Summary of key concepts for: Module 2, Introduction to organic structure and bonding II

- Understand **valence bond theory** and the **hybrid orbital concept**.
- Be able to identify the **hybridization of all carbons** in any organic molecule.
- Be able to accurately **draw the π -bonding picture for a double bond** (side-by-side overlapping p orbitals).
- Be able to describe **what types of orbitals are overlapping** to form the single and double bonds in an organic molecule.
- Be able to distinguish **conjugated** double bonds from **isolated** double bonds.
- Be able to accurately draw the π -bonding picture for a **conjugated π -system**.
- Understand the concept of **resonance**, and understand that resonance **contributors** are not different molecules, just different ways of drawing the same molecule.
- Be able to draw **resonance contributors** correctly.
- Be able to draw **curved arrows** between any two contributors.
- **Major and minor resonance contributors**: be able to evaluate the relative importance of contributors.
- Understand the concept of **resonance delocalization** - what it means when we say that charge is delocalized, or that π electrons are delocalized.
- Recognize and understand **noncovalent interactions**: **Van der Waals, ion-ion, ion-dipole, dipole-dipole, and hydrogen bonding**.
- Be able to recognize whether a group is acting as a **hydrogen bond donor or acceptor**.
- Be able to use your knowledge of noncovalent intermolecular interactions to predict trends in **solubility, melting point, and boiling point**.