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Here is a bullet-point summary of **Molecular Orbital Theory (MOT)** based on **Chemical Bonding**:

- **Molecular Orbital Theory (MOT)** describes chemical bonding in molecules by considering the molecular orbitals formed from the atomic orbitals of the constituent atoms.

- **Linear Combination of Atomic Orbitals (LCAO)**:
  - Atomic orbitals from each atom combine to form molecular orbitals.
  - The number of molecular orbitals formed equals the number of atomic orbitals combined.

- **Types of Molecular Orbitals**:
  - **Bonding Molecular Orbital**: Constructive interference of atomic orbitals, results in increased electron density between nuclei, which stabilizes the molecule.
  - **Antibonding Molecular Orbital**: Destructive interference, leads to a node between nuclei and less electron density, making the molecule less stable.

- **Bond Order Calculation**:
  - Bond order = (Number of electrons in bonding orbitals - Number of electrons in antibonding orbitals) / 2.
  - Higher bond order implies stronger and shorter bonds.

- **Orbital Energy**:
  - Bonding orbitals are lower in energy than the original atomic orbitals, while antibonding orbitals are higher.

- **Filling of Molecular Orbitals**:
  - Molecular orbitals are filled according to the **Aufbau Principle**, **Pauli Exclusion Principle**, and **Hund's Rule**.
  - Electrons first fill the lowest energy bonding orbitals before moving to higher energy antibonding orbitals.

- **Bonding in Diatomic Molecules**:
  - For homonuclear diatomic molecules (e.g., H_2, O_2, N_2), molecular orbitals are formed from s and p atomic orbitals.
  - The sequence of energy levels for molecular orbitals depends on the atomic number (Z). For molecules with atomic numbers less than 8 (like N_2), the σ2p orbital is higher in energy than the π2p orbital, but for atoms with $Z \geq 8$ (like O_2), σ2p is lower than π2p.

- **Paramagnetism and Diamagnetism**:
  - Molecules with unpaired electrons in molecular orbitals exhibit paramagnetism (e.g., O_2 is paramagnetic because it has two unpaired electrons in its π*2p orbitals).

- Molecules where all electrons are paired are diamagnetic.

- **Comparison with Valence Bond Theory (VBT)**:
  - VBT explains bond formation through overlap of atomic orbitals, while MOT uses molecular orbitals formed from the entire molecule.
  - MOT provides better explanations for phenomena like bond order, bond energy, and magnetism (especially for diatomic molecules like O_2).

This summary captures the key points of Molecular Orbital Theory for your study on chemical bonding. If you need more specific examples or diagrams, feel free to ask!