Name _____

Molecule Marvels: The Fascinating Concept of Resonance

Open-Ended Response Answer Key

1. Resonance in molecules is represented using Lewis structures with double-headed arrows between different arrangements of atoms and bonds. For example, nitrate ion (NO3-) has two resonance forms, with the double bond shifting between nitrogen and oxygen atoms.
2. Resonance has real-life applications in pharmaceuticals, where it helps chemists design more effective drugs, and in the study of polymers, where it influences their properties and uses.
3. Resonance is a simplified model that doesn't represent the true structure of molecules accurately. It assumes that electron movement is instantaneous, whereas in reality, it occurs continuously. This model is limited in explaining certain molecular behaviors.
4. Consider ozone (O3) as a molecule with two resonance forms. In one form, two oxygen-oxygen single bonds exist, and in the other, one oxygen-oxygen double bond and one oxygen-oxygen single bond exist. The movement of electrons between oxygen atoms contributes to the stability of ozone by spreading out electron density and preventing the buildup of charges.