# Advanced Chemistry Fundamentals

Chemistry · Answer Key · 8 Questions

**1. Which law of thermodynamics states that the entropy of a perfect crystal at absolute zero is exactly zero?**

A) First Law
B) Second Law
**C) Third Law**
D) Zeroth Law

**2. In chemical kinetics, what is the term for the minimum energy required for a chemical reaction to occur?**

A) Enthalpy
**B) Activation Energy**
C) Gibbs Free Energy
D) Entropy

**3. What is the geometry of a methane molecule (CH4)?**

A) Linear
B) Bent
C) Trigonal planar
**D) Tetrahedral**

**4. Which bond type involves the equal sharing of electrons between two atoms?**

A) Polar covalent
**B) Nonpolar covalent**
C) Ionic
D) Hydrogen

**5. What substance acts as a biological catalyst by lowering the activation energy of reactions?**

**A) Enzyme**
B) Isotope
C) Electrolyte
D) Buffer

**6. Which periodic trend refers to the energy required to remove an electron from a neutral atom in the gas phase?**

A) Electronegativity
B) Atomic radius
**C) Ionization energy**
D) Electron affinity

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**7. According to the Arrhenius definition, what ion is produced when an acid is dissolved in water?**

A) Hydroxide (OH-)
**B) Hydronium (H3O+)**
C) Sodium (Na+)
D) Chloride (Cl-)

**8. What is the relationship between the pressure and volume of a gas at constant temperature, as described by Boyle's Law?**

A) Directly proportional
**B) Inversely proportional**
C) Unrelated
D) Exponentially increasing

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