

Advanced Chemistry Fundamentals

Chemistry · Answer Key · 18 Questions

1. What is the common name for the phenomenon where certain solid compounds sublime at standard temperature and pressure, transitioning directly from solid to gas without passing through a liquid phase?

A) Decomposition

B) Sublimation

C) Vaporization

D) Deposition

2. Which of the following elements is a metalloid and is known for its semiconductor properties, commonly used in transistors?

A) Gallium

B) Germanium

C) Indium

D) Arsenic

3. The Haber-Bosch process is a critical industrial method for synthesizing which essential compound?

A) Sulfuric Acid

B) Ammonia

C) Methanol

D) Nitric Acid

4. What is the approximate atomic mass of a single atom of Carbon-12 in atomic mass units (amu)?

A) 10

B) 11

C) 12

D) 13

5. Which type of chemical bonding involves the sharing of electron pairs between atoms?

A) Ionic bonding

B) Metallic bonding

C) Covalent bonding

D) Hydrogen bonding

6. The term 'enantiomers' in organic chemistry refers to stereoisomers that are:

- A) Identical
- B) Superimposable mirror images
- C) Non-superimposable mirror images**
- D) Geometric isomers

7. Which of the following is a strong oxidizing agent commonly used in laboratory settings and industrial processes?

- A) Sodium Chloride
- B) Hydrogen Peroxide
- C) Potassium Permanganate**
- D) Sodium Hydroxide

8. What is the SI unit of luminous intensity?

- A) Lux
- B) Candela**
- C) Lumen
- D) Watt

9. The rate-determining step in a multi-step chemical reaction is the step that:

- A) Is the fastest
- B) Is the slowest**
- C) Has the highest activation energy
- D) Produces the most product

10. Which element has the highest electronegativity on the Pauling scale?

- A) Oxygen
- B) Chlorine
- C) Fluorine**
- D) Nitrogen

11. What is the common name for the functional group -COOH?

- A) Aldehyde
- B) Ketone
- C) Carboxylic acid**
- D) Ester

12. The phenomenon where certain metal ions can form stable complexes with organic molecules containing donor atoms like nitrogen or oxygen is central to the function of:

- A) Electrolysis
- B) Chelation**
- C) Polymerization
- D) Catalysis

13. Which noble gas is the most abundant in Earth's atmosphere by volume?

- A) Helium
- B) Neon
- C) Argon**
- D) Krypton

14. What is the approximate value of the gas constant (R) in units of J/(mol·K)?

- A) 8.314**
- B) 0.0821
- C) 6.022×10^{23}
- D) 1.602×10^{-19}

15. The process by which a solute is uniformly distributed throughout a solvent is known as:

- A) Precipitation
- B) Evaporation
- C) Dissolution**
- D) Filtration

16. What is the molecular formula of glucose?

- A) C₅H₁₀O₅
- B) C₆H₁₂O₆**
- C) C₁₂H₂₂O₁₁
- D) C₆H₆

17. Which of the following is a characteristic property of a strong electrolyte?

- A) Low conductivity in solution
- B) Little or no ionization in solution
- C) Complete ionization in solution**
- D) Does not dissociate into ions

18. The IUPAC name for the compound CH_3COCH_3 is:

- A) Ethanol
- B) Propanal
- C) Acetone
- D) Propanone**