

Foundational Chemistry Principles

Chemistry · Answer Key · 18 Questions

1. What is the primary reason for the high boiling point of water compared to other molecules of similar molecular weight, such as hydrogen sulfide (H₂S)?

- A) Strong van der Waals forces
- B) Presence of ionic bonds
- C) Extensive hydrogen bonding**
- D) High kinetic energy of water molecules

2. Which noble gas is the most abundant in Earth's atmosphere?

- A) Helium (He)
- B) Neon (Ne)
- C) Argon (Ar)**
- D) Krypton (Kr)

3. The process by which a solid directly transforms into a gas without passing through the liquid phase is known as:

- A) Evaporation
- B) Condensation
- C) Sublimation**
- D) Deposition

4. What fundamental law states that in a chemical reaction, mass is neither created nor destroyed?

- A) Law of Definite Proportions
- B) Law of Multiple Proportions
- C) Law of Conservation of Mass**
- D) Avogadro's Law

5. What is the approximate pH of a neutral solution at standard temperature and pressure?

- A) 0
- B) 7**
- C) 14
- D) 1

6. Which element has the highest electronegativity?

- A) Oxygen (O)
- B) Chlorine (Cl)
- C) Fluorine (F)**
- D) Nitrogen (N)

7. What type of chemical bond involves the sharing of electrons between atoms?

- A) Ionic bond
- B) Metallic bond
- C) Covalent bond**
- D) Hydrogen bond

8. The number of protons in the nucleus of an atom is defined as its:

- A) Mass number
- B) Atomic number**
- C) Isotope number
- D) Neutron number

9. What is the chemical formula for sulfuric acid?

- A) HCl
- B) HNO₃
- C) H₂SO₄**
- D) H₃PO₄

10. Which phenomenon explains why adding salt to water lowers its freezing point?

- A) Osmotic pressure
- B) Boiling point elevation
- C) Freezing point depression**
- D) Surface tension

11. What is the most abundant element in the Earth's crust by mass?

- A) Iron (Fe)
- B) Aluminum (Al)
- C) Silicon (Si)
- D) Oxygen (O)**

12. What is the state of matter characterized by a definite volume but no definite shape?

- A) Solid
- B) Liquid**
- C) Gas
- D) Plasma

13. What term describes a substance that increases the rate of a chemical reaction without itself undergoing any permanent chemical change?

- A) Inhibitor
- B) Catalyst**
- C) Reactant
- D) Product

14. What is the common name for sodium chloride?

- A) Baking soda
- B) Table salt**
- C) Bleach
- D) Vinegar

15. Which of the following is an example of an exothermic reaction?

- A) Melting ice
- B) Photosynthesis
- C) Combustion of wood**
- D) Dissolving salt in water

16. What is the SI unit for pressure?

- A) Newton (N)
- B) Joule (J)
- C) Pascal (Pa)**
- D) Watt (W)

17. The arrangement of electrons in atomic shells is described by which principle?

- A) Heisenberg Uncertainty Principle
- B) Pauli Exclusion Principle
- C) Aufbau Principle**
- D) Hund's Rule

18. Which element is the primary component of natural gas?

- A) Ethane (C₂H₆)
- B) Propane (C₃H₈)
- C) Methane (CH₄)**
- D) Butane (C₄H₁₀)