



Standardized Test Prep

Answer the following items on a separate piece of paper.

1. A chemical bond results from the mutual attraction of the nuclei for
 - A. electrons.
 - B. neutrons.
 - C. protons.
 - D. dipoles.
2. A polar covalent bond is likely to form between two atoms that
 - A. are similar in electronegativity.
 - B. are of similar size.
 - C. differ in electronegativity.
 - D. have the same number of electrons.
3. The Lewis structure of HCN contains
 - A. one double bond and one single bond.
 - B. one triple bond and one single bond.
 - C. two single bonds.
 - D. two double bonds.
4. According to VSEPR theory, the molecular geometry for CH_3^+ is
 - A. tetrahedral.
 - B. trigonal-pyramidal.
 - C. bent or angular.
 - D. None of the above
5. Which molecule contains a double bond?
 - A. COCl_2
 - B. C_2H_6
 - C. CF_4
 - D. SF_2
6. Which molecule is polar?
 - A. CCl_4
 - B. CO_2
 - C. SO_3
 - D. none of these
7. What is the hybridization of the carbon atoms in C_2H_2 ?
 - A. sp
 - B. sp^2
 - C. sp^3
 - D. The carbon atoms do not hybridize in C_2H_2 .

8. Which of the following compounds is predicted to have the highest boiling point?
 - A. HCl
 - B. CH_3COOH (Note: The two oxygen atoms bond to the carbon.)
 - C. Cl_2
 - D. SO_2
9. An unknown substance is an excellent electrical conductor in the solid state and is malleable. What type of chemical bonding does this substance exhibit?
 - A. ionic bonding
 - B. molecular bonding
 - C. metallic bonding
 - D. cannot determine from the information given

SHORT ANSWER

10. What does the hybridization model help explain?
11. Explain why ionic crystals are brittle.

EXTENDED RESPONSE

12. Naphthalene, C_{10}H_8 , is a nonpolar molecule and has a boiling point of 218°C . Acetic acid, $\text{CH}_3\text{CO}_2\text{H}$, is a polar molecule and has a boiling point of 118°C . Which substance has the stronger intermolecular forces? Briefly explain your answer.
13. Describe and explain the potential energy changes that occur during the formation of a covalent bond.

Test TIP

When several questions refer to the same graph, table, drawing, or passage, answer the questions you are sure of first.