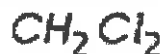


Key

Topic 4 Review Questions

1. Which compound contains both covalent and ionic bonds? Sodium sodium



sodium carbonate,

magnesium bromide,

dichloromethane,

ethanoic acid

- A. sodium carbonate
 B. magnesium bromide
 C. dichloromethane
 D. ethanoic acid

2. Which pair of elements is most likely to form a covalently bonded compound?

- A. Li and Cl
 B. Ca and S
 C. P and O
 D. Zn and Br

3. Given the following electronegativities, which bond would be the most polar? H: 2.2 N: 3.0 O:

3.5 F: 4.0

- A. O-H in H_2O $3.5 - 2.2 = 1.3$
 B. N-O in NO_2 $3.5 - 3 = .5$
 C. N-F in NF_2 $4 - 3 = 1$
 D. N-H in NH_3 $3 - 2.2 = .8$

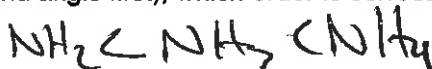
4. When

CH_4 , NH_3 and H_2O are arranged in order of increasing Boiling Pt.

- A. CH_4 , NH_3 , H_2O
 B. NH_3 , CH_4 , H_2O
 C. NH_3 , H_2O , CH_4
 D. H_2O , NH_3 , CH_4

5. When the H-N-H bond angles in the species NH_2^- , NH_3 and NH_4^+ are arranged in order of increasing bond angle (smallest bond angle first), which order is correct?

- A. $\text{NH}_2^- < \text{NH}_3 < \text{NH}_4^+$
 B. $\text{NH}_4^+ < \text{NH}_3 < \text{NH}_2^-$
 C. $\text{NH}_3 < \text{NH}_2^- < \text{NH}_4^+$
 D. $\text{NH}_2^- < \text{NH}_4^+ < \text{NH}_3$



6. In which of the following pairs does the second substance have the lower boiling point?

- A. F_2 , Cl_2
 B. C_2H_6 , C_3H_8
 C. H_2O , H_2S
 D. CH_3OCH_3 , $\text{CH}_3\text{CH}_2\text{OH}$

13. How do bond length and bond strength change as the number of bonds between two atoms increases?

- A. Bond length increases and bond strength increases
- B. Bond length increases and bond strength decreases
- C. Bond length decreases and bond strength increases
- D. Bond length decreases and bond strength decreases

14. Which of the following is true for CO₂?

- A. C=O bond is polar and CO₂ molecule is non-polar
- B. C=O bond is non-polar and CO₂ molecule is polar
- C. C=O bond is polar and CO₂ molecule is polar
- D. C=O bond is non-polar and CO₂ molecule is non-polar

15. The molar masses of C₂H₆, CH₃OH and CH₃F are very similar. How do their boiling points compare?

- A. C₂H₆
- B. CH₃F
- C. CH₃OH
- D. C₂H₆



16. Which statement is true for most ionic compounds?

- A. They contain elements of similar electronegativity
- B. They conduct electricity in the solid state
- C. They are colored
- D. They have high melting and boiling point

17. When the following bond types are listed in decreasing order of strength (strongest first), what is the correct order?

- A. Covalent > Hydrogen > Van der Waals'
- B. Covalent > Van der Waals' > Hydrogen
- C. Hydrogen > Covalent > Van der Waals'
- D. Van der Waals' > Hydrogen > Covalent

18. What is the valence shell electron pair repulsion (VSEPR) Theory used to predict?

- A. The energy levels in an atom
- B. The shapes of molecules and ions
- C. The electronegativities of elements
- D. The type of bonding in a compound

19. Which substance has the lowest electrical conductivity?

- A. Cu(s)
- B. Hg(l)
- C. H₂O(l)
- D. LiOH(aq)

20. Which molecule is non-polar?

- A. H₂CO
- B. SO₃
- C. NF₃
- D. CHCl₃

