Do Now Unit 5 Chemical Bonding 2017-2018

1. An effective collision between reactant particles requires the particles to have the proper

   A) charge and mass
   B) charge and orientation
   C) energy and mass
   D) energy and orientation

2. To break a chemical bond, energy must be

   A) absorbed B) destroyed
   C) produced D) released

3. Which symbol represents an atom in the ground state with the most stable valence electron configuration?

   A) B B) O C) Li **D) Ne**

4. Which symbol represents a particle that has the same total number of electrons as S^{2-}?

   A) O^{2-} B) Si C) Se^{2-} **D) Ar**

5. Which element has the *lowest* electronegativity value?

   A) F **B) Fr** C) Cl D) Cr

6. Sodium hydride and sodium chloride both have bonds which are predominantly

   A) metallic **B) ionic**
   C) covalent D) network

7. Which type of bond results when one or more valence electrons are transferred from one atom to another?

   A) a hydrogen bond
   B) an ionic bond
   C) a nonpolar covalent bond
   D) a polar covalent bond

8. Which compound contains ionic bonds?

   A) N_2O **B) Na_2O**
   C) CO D) CO_2

9. Which formula represents an ionic compound?

   A) H_2 B) CH_4
   C) CH_3OH **D) NH_4Cl**

10. The transfer of electrons from sodium atoms to chlorine atoms results in the formation of

    A) coordinate covalent bonds
    B) polar covalent bonds
    C) nonpolar bonds
    D) ionic bonds

11. Which formula is described correctly?

    A) $BaCl_2$ is covalent and molecular.
    B) H_2O_2 is covalent and empirical.
    C) H_2O is ionic and molecular.
    D) NaCl is ionic and empirical.

12. Hydrogen forms a negative ion when it combines with sodium to form NaH. This is primarily because hydrogen

    A) loses an electron to sodium
    B) has a greater attraction for electrons than sodium has
    C) is a larger atom than sodium
    D) has a smaller ionization energy than sodium

13. When ionic bonds are formed, metallic atoms tend to

    A) lose electrons and become negative ions
    B) lose electrons and become positive ions
    C) gain electrons and become negative ions
    D) gain electrons and become positive ions

14. Which substance dissolves in pure water and produces a solution that is a good conductor of electricity?

    A) $CaCl_2$ B) $C_6H_{12}O_6$
    C) N_2 D) O_2

15. A student determined the solubility of an unknown solid in various solvents as shown in the table below.

Solvent	Solubility
benzene	insoluble
water	soluble
ethanol	slightly soluble
toluene	insoluble

Based on these solubility results, the unknown solid is best described as

A) ionic B) nonpolar
C) network D) metallic

16. A crystalline solid has a high melting point and is a good conductor of electricity in the liquid state. This solid could be

A) CO_2 B) Hg
C) $C_6H_{12}O_6$ **D) KCl**

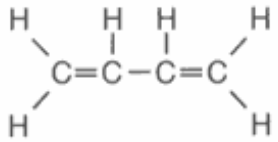
17. What is the total number of electrons shared in a double covalent bond between two atoms?

A) 1 B) 2 C) 8 **D) 4**

18. The bond between Br atoms in a Br_2 molecule is

A) ionic and is formed by the sharing of two valence electrons
B) ionic and is formed by the transfer of two valence electrons
C) covalent and is formed by the sharing of two valence electrons
D) covalent and is formed by the transfer of two valence electrons

19. Given the formula of a substance:



What is the total number of shared electrons in a molecule of this substance?

A) 22 B) 11 C) 9 D) 6

20. An oxygen molecule contains a double bond because the two atoms of oxygen share a total of

A) 1 electron B) 2 electrons
C) 3 electrons **D) 4 electrons**

21. Which type of bonding is found in all molecular substances?

A) covalent bonding B) hydrogen bonding
C) ionic bonding D) metallic bonding

22. Which formula represents a molecular compound?

A) Kr B) LiOH
C) N_2O_4 D) NaI

23. Which characteristic is a property of molecular substances?

A) good heat conductivity
B) good electrical conductivity
C) low melting point
D) high melting point

24. Which formula represents a molecular compound?

A) HI B) KI C) KCl D) LiCl

25. What is the maximum number of covalent bonds that a carbon atom can form?

A) 1 B) 2 C) 3 **D) 4**

26. Which statement correctly describes diamond and graphite, which are different forms of solid carbon?

A) They differ in their molecular structure,only.
B) They differ in their properties, only.
C) They differ in their molecular structure and properties.
D) They do not differ in their molecular structure or properties.

27. Which terms describe a substance that has a low melting point and poor electrical conductivity?

A) covalent and metallic
B) covalent and molecular
C) ionic and molecular
D) ionic and metallic

28. In which material are the particles arranged in a regular geometric pattern?

A) $CO_2(g)$ B) NaCl(aq)
C) $H_2O(\ell)$ **D) $C_{12}H_{22}O_{11}(s)$**

29. Which type of substance is soft, has a low melting point, and is a poor conductor of heat and electricity?

A) network solid **B) molecular solid**
C) metallic solid D) ionic solid

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30. The table below lists the melting points of various substances.

SUBSTANCE	PHASECHANGE (solid − liquid)	MELTINGPOINT (K)
chlorine	$Cl_2 - Cl_2(\ell)$	172
water	$H_2O(s) - H_2O(\ell)$	273
sodiumchloride	$NaCl(s) - NaCl(\ell)$	1073
copper	$Cu(s) - Cu(\ell)$	1356

Based on this table, which type of substance has the highest melting point?

A) nonpolar covalent
B) polar covalent
C) ionic
D) metallic

31. Which substance contains particles held together by metallic bonds?

A) Ni(s) B) Ne(s) C) $N_2(s)$ D) $I_2(s)$

32. The table below contains data for compounds *A*, *B*, *C*, and *D*.

COMPOUND	MELTING POINT (°C)	BOILING POINT (°C)	ELECTRICAL CONDUCTIVITY (Stats)		SOLUBILITY IN WATER
A	800.4	1413	excellent	(liquid)	good
B	1710	2230	verypoor	(solid)	insoluble
C	42.5	216.3	poor	(solid)	poor
D	1063	2582	excellent	(solid)	insoluble

Which list identifies the type of bonding characteristic of each compound's solid phase?

A) *A* -ionic *B* -network *C* -metallic *D*-molecular
B) *A* -network *B* -ionic *C* -molecular *D*-metallic
C) *A* -metallic *B* -molecular *C*-network *D*-ionic
D) *A* -ionic *B* -network *C* -molecular *D*-metallic

33. Which of the following compounds has the highest boiling point?

A) H_2O B) H_2S C) H_2Se D) H_2Te

34. Which of these formulas contains the most polar bond?

A) H–Br B) H–Cl **C) H–F** D) H–I

35. The chemical bond in a hydrogen molecule is

A) nonpolar covalent
B) polar covalent
C) ionic
D) electrovalent

36. Which type of bond is present in a water molecule?

A) polar covalent B) nonpolar covalent
C) ionic D) electrovalent

37. Which compound has molecules that form the strongest hydrogen bonds?

A) HI B) HBr **C) HF** D) HCl

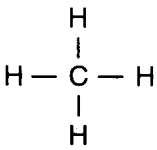
38. In aqueous solution, a chloride ion is attracted to which end of the water molecule?

A) the hydrogen end, which is the positive pole
B) the hydrogen end, which is the negative pole
C) the oxygen end, which is the positive pole
D) the oxygen end, which is the negative pole

39. Two fluorine atoms are held together by a covalent bond. Which statement correctly describes this bond?

    A) It is polar and forms a polar molecule.
    B) It is polar and forms a nonpolar molecule.
    C) It is nonpolar and forms a polar molecule.
    D) It is nonpolar and forms a nonpolar molecule.

40. Which structural formula represents a polar molecule?

    A) H — H
    B) H — C ≡ C — H
    C)
    
    D)
    

41. The symmetrical structure of the CH_4 molecule is due to the fact that the four single bonds between carbon and hydrogen atoms are directed toward the corners of a

    A) triangle
    B) tetrahedron
    C) square
    D) rectangle

Answer Key
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1. **D**
2. **A**
3. **D**
4. **D**
5. **B**
6. **B**
7. **B**
8. **B**
9. **D**
10. **D**
11. **D**
12. **B**
13. **B**
14. **A**
15. **A**
16. **D**
17. **D**
18. **C**
19. **A**
20. **D**
21. **A**
22. **C**
23. **C**
24. **A**
25. **D**
26. **C**
27. **B**
28. **D**
29. **B**
30. **D**
31. **A**
32. **D**
33. **A**
34. **C**
35. **A**
36. **A**
37. **C**
38. **A**
39. **D**
40. **D**
41. **B**