

Name:

Date:

Hour:

AP Chem Ch.8 Test

- 1) Which of the following groups contains no ionic compounds?
 - A) HCN, NO₂, Ca(NO₃)₂
 - B) PCl₅, LiBr, Zn(OH)₂
 - C) KOH, CCl₄, SF₄
 - D) NaH, CaF₂, NaNH₂
 - E) CH₂O, H₂S, NH₃

- 2) In which pair do both compounds exhibit predominantly ionic bonding?
 - A) SCl₆ and HF
 - B) Na₂SO₃ and NH₃
 - C) KI and O₃
 - D) LiF and H₂O
 - E) LiBr and MgO

- 3) Atoms having equal or nearly equal electronegativities are expected to form
 - A) no bonds
 - B) polar covalent bonds
 - C) nonpolar covalent bonds
 - D) ionic bonds
 - E) covalent bonds

- 4) Choose the compound with the most ionic bond.
 - A) LiCl
 - B) KF
 - C) NaCl
 - D) LiF
 - E) KCl

- 5) Which of the following bonds is least polar?
 - A) C—O
 - B) H—C
 - C) S—Cl
 - D) Br—Br
 - E) They are all nonpolar.

- 6) Atoms with greatly different electronegativity values are expected to form
 - A) no bonds
 - B) covalent bonds
 - C) triple bonds
 - D) ionic bonds
 - E) none of these

- 7) For the elements Cs, F, and Cl, the order of increasing electronegativity is:
- A) $F < Cl < Cs$
 - B) $Cs < Cl < F$
 - C) $Cl < Cs < F$
 - D) $F < Cs < Cl$
 - E) none of these
- 8) Based on electronegativity differences, which of the following is most likely to be ionic?
- A) CaF_2
 - B) Br_2
 - C) BH_3
 - D) NO
 - E) CF_4
- 9) The electron pair in a C-F bond could be considered
- A) closer to C because carbon has a larger radius and thus exerts greater control over the shared electron pair
 - B) closer to F because fluorine has a higher electronegativity than carbon
 - C) closer to C because carbon has a lower electronegativity than fluorine
 - D) an inadequate model since the bond is ionic
 - E) centrally located directly between the C and F
- 10) In which of the following compounds does the bond between the central atom and bromine have the greatest ionic character?
- A) $LiBr$
 - B) KBr
 - C) $SeBr_2$
 - D) $AsBr_3$
 - E) $CaBr_2$
- 11) Which of the following molecules has no dipole moment?
- A) CO_2
 - B) NH_3
 - C) H_2O
 - D) all
 - E) None
- 12) Which of the following has the smallest radius?
- A) Br^-
 - B) S^{2-}
 - C) Xe
 - D) Ca^{2+}
 - E) Kr

13) Which of these is an isoelectronic series?

- A) Na^+ , K^+ , Rb^+ , Cs^+
- B) K^+ , Ca^{2+} , Ar , S^{2-}
- C) Na^+ , Mg^{2+} , S^{2-} , Cl^-
- D) Li , Be , B , C
- E) none of these (A-D)

14) Which of the following statements are *true* concerning ionic bonding?

- A) Ionic bonding occurs between a metal, which has a high affinity for electrons, and a nonmetal, which loses electrons relatively easy.
- B) CaCl_2 forms because Ca^{2+} is always a more stable species than the calcium atom alone.
- C) Compounds with ionic bonds tend to have low melting points.
- D) The electronegativity difference between the bonding atoms of ionic compounds is small since the electrons are not shared but rather held together by electrostatic forces.
- E) All of the above statements are false.

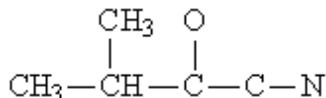
15) In the reaction between magnesium and sulfur, the magnesium atoms

- A) become anions
- B) become cations
- C) become part of polyatomic ions
- D) share electrons with sulfur
- E) crystallize

16) In the Lewis structure for elemental nitrogen there is (are)

- A) a single bond between the nitrogens
- B) a double bond between the nitrogens
- C) a triple bond between the nitrogens
- D) three unpaired electrons
- E) none of the above

17) Complete the Lewis structure for the molecule:



This molecule has _____ single bonds and _____ multiple bonds.

- A) 4, 2
- B) 6, 3
- C) 11, 5
- D) 11, 2
- E) 13, 0

- 18) Which of the following compounds contains only one unshared pair of valence electrons?
- A) NH_3
 - B) H_2O
 - C) CH_4
 - D) NaCl
 - E) BF_3
- 19) In the Lewis structure for SF_6 , the central sulfur atom shares _____ electrons.
- A) 4
 - B) 8
 - C) 10
 - D) 12
 - E) None of the above, because SF_6 is an ionic compound.
- 20) How many resonance structures can be drawn for the nitrate ion?
- A) 1
 - B) 2
 - C) 3
 - D) 4
 - E) 5
- 21) The size of a cation is _____ than the neutral atom
- A) larger
 - B) smaller
 - C) same size
 - D) too much information
- 22) How many of the following molecules possess dipole moments?
 BH_3 , CH_4 , PCl_5 , H_2O , HF , H_2
- A) 1
 - B) 2
 - C) 3
 - D) 4
 - E) 5
- 23) As the number of bonds between two carbon atoms increases, which one of the following decreases?
- A) number of electrons between the carbon atoms
 - B) bond energy
 - C) bond length
 - D) all of these
 - E) none of these

- 24) Which of the following types of molecules always has a dipole moment?
- A) Linear molecules with two identical bonds.
 - B) Tetrahedral molecules (four identical bonds equally spaced).
 - C) Trigonal pyramid molecules (three identical bonds).
 - D) Trigonal planar molecules (three identical bonds equally spaced).
 - E) None has a dipole moment.

- 25) How many of the following molecules or ions are linear?

- NH₃ OF₂ HCN CO₂ NO₂
- A) 0
 - B) 1
 - C) 2
 - D) 3
 - E) 4

- 26) The bond angles in a tetrahedral molecule are:

- A) 120°
- B) 60°
- C) 109°
- D) 180°
- E) 90°

- 27) NO₃⁻

- A) linear
- B) trigonal planar
- C) tetrahedral
- D) bent
- E) none of these

- 28) The bond angles in a trigonal planar molecule PLUS a linear molecule add up to:

- A) 120
- B) 180
- C) 300
- D) 360
- E) not enough information

- 29) The geometry of SF₆ would be:

- A) linear
- B) octahedral
- C) trigonal bipyramidal
- D) trigonal planar

- 30) Which ion is larger in each pair? i) O^{2-} or S^{2-} ii) Fe^{2+} or Fe^{3+} iii) S^{2-} or K^+
- A) S^{2-} , Fe^{2+} , S^{2-}
 - B) S^{2-} , Fe^{3+} , S^{2-}
 - C) O^{2-} , Fe^{3+} , K^+
 - D) S^{2-} , Fe^{2+} , K^+
 - E) O^{2-} , Fe^{2+} , S^{2-}

GO VIKINGS!!