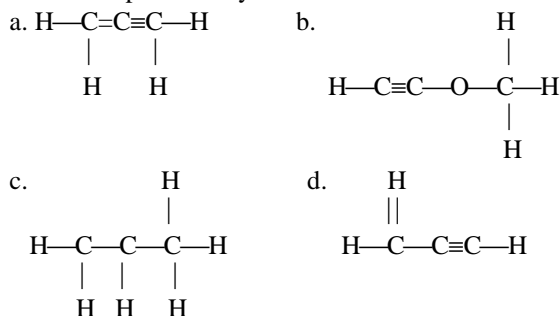


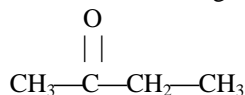
Practice Fall Final Exam (Chemistry 08-09)

- The name of SO_4^{2-} is
 - sulfur tetraoxide
 - sulfite
 - sulfate
 - monosulfur tetraoxide
- The correct formula for hydrogen is
 - H
 - H_2
 - H_3
 - H^+
- The law of conservation of matter follows from the concepts that
 - atoms are the smallest unit of matter
 - atoms of different elements have different properties.
 - matter cannot be created nor destroyed
 - atoms can be destroyed in chemical reactions.
- This is what determines the identity of an element:
 - relative atomic mass
 - mass number
 - average atomic mass
 - atomic number
- Ammonia, NH_3 is a _____ compound and therefore _____ dissolve in water.
 - polar, will
 - polar, will not
 - nonpolar, will
 - nonpolar, will not
- A particle that has about the same mass as a proton, but with no electrical charge, is called a(n)
 - nuclide.
 - neutron.
 - electron
 - isotope
- Isotopes of an element contain different numbers of
 - electrons
 - protons
 - neutrons.
 - nuclides
- An atomic spectrum of an atom is caused by the energy released when electrons
 - jump to a higher energy level.
 - fall to a lower energy level.
 - absorb energy and jump to a higher energy level
 - absorb energy and fall to a lower energy level.
- Tetracarbon decahydride is not attracted toward a charged wand and spreads out when added to wax paper. What type of intermolecular forces does this molecule exhibit?
 - London Dispersion Forces
 - Hydrogen Bonding
 - Dipole-Dipole interactions
 - Covalent bonding
- The correct formula for Magnesium chloride is
 - MgCl
 - MgCl_2
 - Mg_2Cl_2
 - Mg_2Cl
- Those elements that are good conductors of electricity are
 - nonmetals
 - gases
 - metals.
 - semimetals
- The correct formula for dinitrogen hexachloride is
 - N_6Cl_2
 - N_2Cl_6
 - NCl_3
 - NO_2Cl_6
- As you move down the periodic table from carbon through lead, atomic radii
 - generally increase
 - generally decrease
 - do not change
 - vary unpredictably.
- The correct formula for calcium hydroxide is
 - CaOH
 - CaOH_2
 - CaH_2
 - CaH
- When the octet rule is satisfied, the outermost _____ are filled.
 - d and f orbitals
 - s and p orbitals
 - s and d orbitals
 - d and p orbitals
- Once an atom has full s and p orbitals in its outermost energy level,
 - it is highly reactive only with alkali metals
 - it is highly reactive only with halogens.
 - it can be combined with most elements.
 - it has a stable octet and is unreactive and has satisfied its noble gas envy.
- What is the formula for the compound formed by calcium ions, Ca^{2+} , and chloride ions, Cl^- ?
 - CaCl
 - Ca_2Cl
 - CaCl_3
 - CaCl_2
- Name the compound KCl .
 - potassium chloride
 - potassium chlorate
 - potassium chlorine
 - potassium monochloride
- The chemical bond formed when two atoms share electrons is called a(n)
 - ionic bond
 - orbital bond
 - Lewis structure
 - covalent bond
- If the difference in electronegativity is larger than 2.1, the bond is
 - polyatomic
 - ionic
 - polar covalent
 - nonpolar covalent
- The C---F bond (electronegativity for C is 2.5; electronegativity for F is 4.0) in CF_4 is
 - polar covalent
 - ionic
 - nonpolar covalent
 - polar covalent
- The following molecules contain polar bonds. The only nonpolar molecule is
 - HCl
 - H_2O
 - CO_2
 - NH_3
- What is the correct name of Na_3N ?
 - sodium nitride
 - sodium nitrite
 - trisodium mononitride
 - trisodium nitride

24. The forces of attraction between molecules in a molecular compound are
 a. stronger than the forces of ionic bonding b. weaker than the forces of ionic bonding
 c. approximately equal to the forces of ionic bonding d. zero.
25. The weak intermolecular forces resulting from temporary dipoles are called
 a. London dispersion forces b. dipole-dipole forces c. hydrogen forces d. polar covalent bonding
26. Carbon shows a very strong tendency to form
 a. ionic bonds b. covalent bonds c. 5 bonds with other nonmetals d. 2 bonds with other nonmetals
27. How many outermost electrons does a carbon atom have?
 a. 3 b. 4 c. 5 d. 6
28. When a carbon atom forms four covalent bonds, the bonds are directed toward the corners of a
 a. triangle b. pyramid c. square d. tetrahedral
29. All organic compounds containing the same functional group
 a. have the same name b. are classified together
 c. undergo different chemical reactions d. behave differently
30. Which of the following is the functional group in alcohols?
 a. $-\text{COOH}$ b. $-\text{COH}$ c. $-\text{CO}$ d. $-\text{O}-$
31. Which compound obeys HONC 1234?



32. To which class does the organic compound shown in the figure belong?



- a. aldehyde b. carboxylic acid c. ketone d. ester
33. What is the correct name for P_2O_5 ?
 a. phosphorous oxide b. phosphorous (II) oxide (V) c. diphosphorous pentoxide d. dipotassium pentoxide
34. Silicon dioxide is a hard solid consisting of nonmetals. Its bonding type is _____ and it _____ dissolve in water.
 a. covalent network, will not b. molecular covalent, will not c. covalent network, will d. molecular covalent, will
35. Which of the following molecules is most stable?
 a. H_2S b. HS_2 c. HS d. H_3S_2
36. Which of following is not stable?
 a. H_2O b. CO_2 c. CH_3 d. CH_4
37. According to the HONC-1234 rule how many bonds must Nitrogen have?
 a. 1 b. 3 c. 5 d. 2
38. How many bonds will Selenium form?
 a. 1 b. 2 c. 3 d. 4
39. Which of the following molecules is most electronegative?
 a. C b. N c. O d. F
40. Which of the following is least electronegative?
 a. Fe b. Zn c. La d. S
41. Which of the following molecules will be polar?
 a. H_2 b. O_2 c. H_2O d. CO_2
42. Which of the following molecules will NOT have a polar bond?
 a. H_2O b. CO_2 c. H_2 d. NH_3
43. Which is a solution that when placed on wax paper will not "bead up" like water?
 a. Hexane b. Isopropanol c. Acetic Acid
44. What causes the water molecules to be attracted to the negatively charged wand?
 a. The negative charged oxygen b. the positively charged oxygen
 c. The positively charged Hydrogen d. the negatively charged Hydrogen
45. What could you say about an unknown substance that when dripped on wax paper does not "bead up"?

- a. It is polar b. It is non-polar
46. Which of the following is true about the properties of a polar solution?
a. doesn't "bead up" b. attracted to a charged wand
c. is not dissolved by water d. has no reaction to a charged wand
47. What element has the following electron configuration: $[\text{He}]2s^22p^1$?
(A) Li (B) B (C) Na (D) A
48. What type of bonding is found in methanol, $\text{CH}_3\text{OH}(\text{l})$?
(A) ionic (B) metallic (C) covalent network (D) molecular covalent
49. What type of bonding is found in magnesium fluoride, $\text{MgF}_2(\text{s})$?
(A) ionic (B) metallic (C) covalent network (D) molecular covalent
50. If the electronegativity difference between two atoms is extremely small, what type of bond will they form?
(A) ionic (B) polar covalent (C) nonpolar covalent (D) nonpolar ionic
51. If the electronegativity difference between two atoms is extremely large, what type of bond will they form?
(A) ionic (B) polar covalent (C) nonpolar covalent (D) nonpolar ionic
52. How many electrons (in a Lewis dot structure) must surround each element for a molecule to be stable?
a) Four
b) Five
c) One
d) Eight
53. Which molecule is stable?
a) NH_2
b) NH_3
c) NH_4
d) NH
54. How many hydrogen atoms need to be added to C_4O_2 to make a stable molecule?
a) six
b) ten
c) nine
d) eleven
55. Which molecule is stable?
a) $\text{C}_3\text{H}_5\text{O}$
b) $\text{C}_2\text{H}_4\text{O}$
c) $\text{C}_3\text{H}_6\text{O}$
d) C_3HO
56. What is not true of valence electrons?
a) The electrons on the outermost shell.
b) The electrons in the highest energy level.
c) The electrons that occupy the s, p, d, and/or f block.
d) The electrons related to the element's period number.
57. As (Arsenic) has _____ valence electrons.
a) 15
b) 6
c) 5
d) 4
58. An element has the electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$, how many valence electron does this

element have?

- a) 12
- b) 14
- c) 2
- d) 4

59. What noble gas electron configuration does the Cl^- ion have?

- a) Ar
- b) He
- c) Kr
- d) Ne

60. How many domains does formaldehyde, CH_2O have?

- a) four
- b) three
- c) two
- d) one

61. What shape has four domains and one lone pair?

- a) bent
- b) tetrahedral
- c) pyramidal
- d) trigonal planar

62. What shape is N_2 ?

- a) linear
- b) bent
- c) stringy
- d) tetrahedral

63. In the molecule C_2H_6 , what is the shape surrounding one of the carbon atoms?

- a) linear
- b) pyramidal
- c) tetrahedral
- d) trigonal planar

64. If the atoms that share electrons have an unequal attraction for the electrons, the bond is called...

- a) nonpolar covalent
- b) polar covalent
- c) ionic
- d) dipolar

65. In which of these compounds is the bond between the atoms NOT a nonpolar covalent bond?

- a) F_2
- b) HCl
- c) H_2
- d) O_2

66. Which atom can form the most polar bond?

- a) S
- b) Br
- c) As
- d) Cl

67. How many bond pairs are shared between the C and N atoms in HCN ?

- a) 1
- b) 2
- c) 3
- d) 4

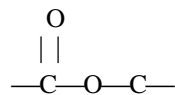
68. What is the total number of lone pairs in CH_3Cl ?

- a) 1
- b) 2
- c) 3
- d) 4

69. Which of these about catalysts is not true?

- a) Catalysts are consumed during the chemical process.
- b) Catalysts can speed up chemical reactions.

- c) Sulfuric acid (H_2SO_4) is a catalyst.
 d) A catalyst is often added to the reactants at the beginning of an experiment.
70. You have a liquid that smells sweet. Which chemical could it be?
 a) butyric acid
 b) phenylethylamine
 c) isoamyl acetate
 d) 1-carvone
71. What functional group is present in citronellol?
 a) ester
 b) alcohol
 c) aldehyde
 d) carboxylic acid
72. Which of these is covalent?
 a) GeH_4
 b) KBr
 c) Li_2O
 d) NaCl
73. In a covalent bond, the electrons
 a) are shared between two metals
 b) are not shared at all
 c) are not involved in bonding
 d) none of the above
74. When metal atoms bond with nonmetal atoms, the nonmetal atoms will
 a. lose electrons and an ionic bond will form b. gain electrons and an ionic bond will form
 c. lose electrons and a covalent bond will form d. gain electrons and a covalent bond will form
75. Which compound is a poor conductor of heat and electricity and has a high melting point?
 a. CO_2 b. H_2O c. N_2O d. SiO_2
76. When a potassium atom reacts with bromine, the potassium atom will
 a. lose 2 electrons b. gain only 1 electron c. gain 2 electrons d. lose only 1 electron
77. A diamond consists of covalent network bonded carbon atoms. The diamond is
 a. hard and cannot dissolve in water b. hard and can dissolve in water
 c. hard and is a good conductor of electricity d. soft and is a poor conductor of electricity
78. Which formula represents an ionic compound?
 a. K_2O b. SO_2 c. CO_2 d. H_2O
79. What is the formula for calcium, Ca^{2+} , bonded to cyanide, CN^- ?
 a. CaSCN_2 b. $\text{Ca}(\text{CN})_2$ c. $\text{Ca}(\text{SCN})_2$ d. CaCN_2
80. A white crystalline SALT conducts electricity when it is melted and when it is dissolved in water. What type of bond does this salt contain?
 a. ionic b. metallic c. covalent d. network
81. What do you name the compound when Li bonds with O?
 a. lithium dioxide b. lithium oxide c. lithium dioxygen d. dilithium oxide
82. $\text{C}_4\text{H}_8\text{O}_2$ is an example of a(n)
 a. molecular formula b. empirical formula c. structural formula d. ionic formula
83. Predict the smell of ethanoic acid.
 a. putrid b. fishy c. sweet d. camphor
84. What is the name of the following functional group?



- a. sweet b. ester c. carboxylic acid d. putrid

85. What functional group does ethanol have in its structure?
 a. alcohol b. aldehyde c. camphor d. minty

Answers:

- 1.c 2.d 3.c 4.d 5.a 6.b 7.c 8.b 9.a 10.b 11.c 12.b 13.a 14.c 15.b 16.d 17.d 18.a 19.d 20.b 21.a or d 22.c 23.a 24.b 25.a 26.b 27.b 28.d 29.a 30.b 31.b 32.c 33.c 34.a 35.a 36.c 37.b 38.b 39.d 40.c 41.c 42.c 43.a 44.c 45.b 46.b 47.b 48.d 49.a 50.c 51.a 52.d 53.b 54.b 55.c 56. d 57.c 58.d 59.a 60.b 61.c 62.a 63.c 64.b 65.b 66.d 67.c 68.c 69.a 70.c 71.b 72.a 73.d 74.b 75.d 76.d 77.a 78.a 79.b 80.a 81.b 82.a 83.a 84.b 85.a

