

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

AP Chemistry Summer Review Packet 2018

Section A.

Determine the empirical/molecular formula (lowest whole number ratio) of the following compounds from the given data. (5 points each)

1) 49.48% carbon, 5.19 % hydrogen, 28.85% nitrogen, and 16.48% oxygen by mass. The molecular weight is 194.19 g/mol.

2) 70.79% carbon, 8.91% hydrogen, 15.72% oxygen, and 4.59% nitrogen.

3) 36.86% nitrogen and 63.14% oxygen.

4) The empirical formula of a substance is  $C_2H_4NO$ . If its molar mass is 116.1 g/mol, what is the molecular formula of the compound?



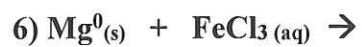
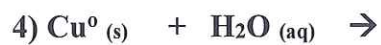
**Part C:**

**Write and balance polyatomic formulas from the given metals/cations and non-metals/ anions. Make sure all formulas are neutral.**

	$\text{CO}_3^{-2}$	$\text{SO}_4^{-2}$	$\text{PO}_4^{-3}$	$\text{NO}_3^{-}$	$\text{OH}^{-}$
$\text{Sn}^{4+}$					
$\text{Cr}^{3+}$					
$\text{Li}^{+}$					
$\text{NH}_4^{+1}$					
$\text{Ca}^{2+}$					

**Part D:**

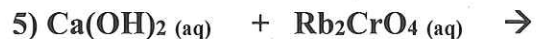
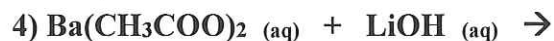
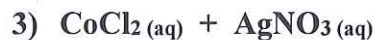
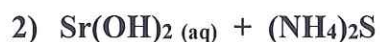
Predict if the following single displacement reactions will yield products. Label the new products as solid (s) neutral atoms and aqueous (aq) compounds. Balance the reaction and determine if the new aqueous (aq) compound is soluble. (5 points each)



### Part E: Double Displacement/Solubility Reactions

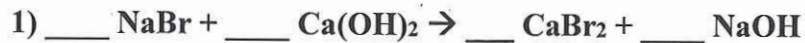
- Predict if the following reactions will take place using your rules for solubility.
- Write the new products and show all states using (aq) for the soluble product and (s) for the insoluble product. Use (g) for gases and (l) for water in gas generation reactions.
- Balance the reaction.
- Show all the soluble cations and anions for a precipitation reaction (pull the reaction apart) and the final insoluble (solid) product.

1) Aqueous lead (II) nitrate  $\text{Pb}(\text{NO}_3)_2$  reacts with aqueous potassium chloride  $\text{KCl}$ .



Section F:

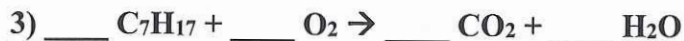
Balance the following chemical reactions using whole number coefficients and then identify the reaction type.



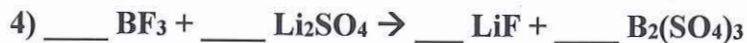
Type of reaction:  $\underline{\hspace{10cm}}$



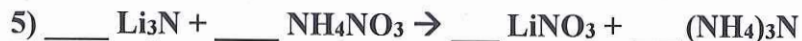
Type of reaction:  $\underline{\hspace{10cm}}$



Type of reaction:  $\underline{\hspace{10cm}}$



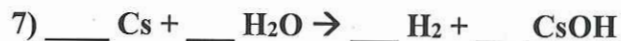
Type of reaction:  $\underline{\hspace{10cm}}$



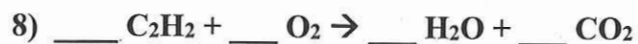
Type of reaction:  $\underline{\hspace{10cm}}$



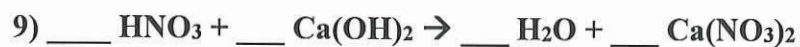
Type of reaction:  $\underline{\hspace{10cm}}$



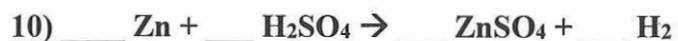
Type of reaction:  $\underline{\hspace{10cm}}$



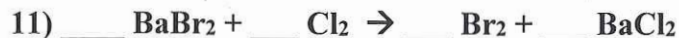
Type of reaction:  $\underline{\hspace{10cm}}$



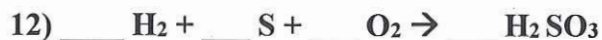
Type of reaction:  $\underline{\hspace{10cm}}$



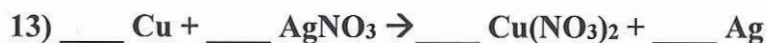
Type of reaction: \_\_\_\_\_



Type of reaction: \_\_\_\_\_



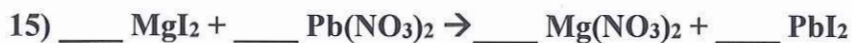
Type of reaction: \_\_\_\_\_



Type of reaction: \_\_\_\_\_



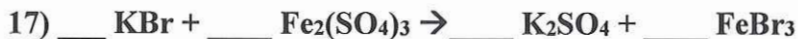
Type of reaction: \_\_\_\_\_



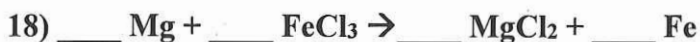
Type of reaction: \_\_\_\_\_



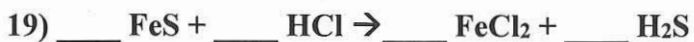
Type of reaction: \_\_\_\_\_



Type of reaction: \_\_\_\_\_



Type of reaction: \_\_\_\_\_



Type of reaction: \_\_\_\_\_



Type of reaction: \_\_\_\_\_

**Section G:**

Match the name on the left with the formula on the right. Use capital letters.

- |                               |                                      |
|-------------------------------|--------------------------------------|
| 1) _____ Nitric acid          | a. $\text{NH}_4^+$                   |
| 2) _____ Hydrochloric acid    | b. $\text{Br}_2$                     |
| 3) _____ Nitrous acid         | c. $\text{S}^{2-}$                   |
| 4) _____ Sulfurous acid       | d. $\text{HNO}_2$                    |
| 5) _____ Hydrobromic acid     | e. $\text{H}_3\text{PO}_3$           |
| 6) _____ Hydrosulfuric acid   | f. $\text{SO}^{2-}$                  |
| 7) _____ Acetic acid          | g. $\text{H}_2\text{OS}$             |
| 8) _____ Hydrofluoric acid    | h. $\text{NH}_3$                     |
| 9) _____ Ammonia              | i. $\text{CH}_3\text{COO}^-$         |
| 10) _____ Sulfuric acid       | j. $\text{OH}^-$                     |
| 11) _____ Carbonic acid       | k. $\text{H}_2\text{CO}_3$           |
| 12) _____ Phosphoric acid     | l. $\text{HNO}_3$                    |
| 13) _____ nitrate anion       | m. $\text{HF}$                       |
| 14) _____ ammonium cation     | n. $\text{HCl}$                      |
| 15) _____ phosphate anion     | o. $\text{SO}_3^{2-}$                |
| 16) _____ sulfide anion       | p. $\text{HBr}$                      |
| 17) _____ nitrite anion       | q. $\text{CO}_3^{2-}$                |
| 18) _____ oxide anion         | r. $\text{SO}_4^{2-}$                |
| 19) _____ sulfate anion       | s. $\text{H}_2\text{O}$              |
| 20) _____ carbonate anion     | t. $\text{H}_2\text{SO}_3$           |
| 21) _____ acetate anion       | u. $\text{NO}_3^-$                   |
| 22) _____ sulfite anion       | v. $\text{H}_2\text{SO}_4$           |
| 23) _____ hydroxide anion     | w. $\text{H}_3\text{PO}_4$           |
| 24) _____ Phosphorous acid    | x. $\text{NO}_2^-$                   |
| 25) _____ Dihydrogen monoxide | y. $\text{HC}_2\text{H}_3\text{O}_2$ |
| 26) _____ diatomic molecule   | z. $\text{PO}_4^{3-}$                |



Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

## AP Chemistry Summer Review 2018

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1) What does "X" represent in the following symbol?
- $$\begin{matrix} 28 \\ 14 \end{matrix} X$$
- A) silicon  
B) sulfur  
C) zinc  
D) ruthenium  
E) nickel
- \_\_\_\_\_ 2) Which of the following elements is a gas at room temperature?
- A) bromine  
B) carbon  
C) helium  
D) sodium
- \_\_\_\_\_ 3) How many silver atoms are contained in 3.75 moles of silver?
- A)  $1.23 \times 10^{24}$  silver atoms  
B)  $2.26 \times 10^{24}$  silver atoms  
C)  $1.61 \times 10^{23}$  silver atoms  
D)  $2.44 \times 10^{26}$  silver atoms  
E)  $6.50 \times 10^{25}$  silver atoms
- \_\_\_\_\_ 4) Determine the molecular formula of a compound that has a molar mass of 92.0 g/mol and an empirical formula of  $\text{NO}_2$ .
- A)  $\text{N}_2\text{O}_3$   
B)  $\text{N}_3\text{O}_6$   
C)  $\text{N}_2\text{O}_4$   
D)  $\text{NO}_2$   
E)  $\text{N}_2\text{O}_5$
- \_\_\_\_\_ 5) Predict the charge that an ion formed from sodium would have.
- A) 1-  
B) 6+  
C) 3-  
D) 1+  
E) 2-

- \_\_\_\_\_ 6) Which of the following statements is FALSE?
- A) Halogens are very reactive elements.
  - B) The alkali metals are fairly unreactive.
  - C) Sulfur is a main group element.
  - D) Noble gases do not usually form ions.
  - E) Zn is a transition metal.
- \_\_\_\_\_ 7) Predict the charge that an aluminum ion would have.
- A) 5-
  - B) 1+
  - C) 1-
  - D) 2+
  - E) 3+
- \_\_\_\_\_ 8) Which of the following statements about isotopes is TRUE?
- A) Isotopes of the same element differ only in the number of electrons they contain.
  - B) An isotope of an atom with a larger number of neutrons is larger than an isotope of the same atom that contains fewer neutrons.
  - C) Isotopes of the same element have the same mass.
  - D) Isotopes of the same element don't usually have the same properties.
  - E) Some elements have 3 or more naturally occurring isotopes.
- \_\_\_\_\_ 9) Determine the name for  $\text{H}_2\text{CO}_3$ .
- A) carbonous acid
  - B) dihydrogen carbonate
  - C) carbonic acid
  - D) hydrocarbonic acid
  - E) hydrocarbide acid
- \_\_\_\_\_ 10) Semiconductors are
- A) metalloids.
  - B) noble gases.
  - C) nonmetals.
  - D) metals.
- \_\_\_\_\_ 11) Identify the compound with ionic bonds.
- A) Ne
  - B) CO
  - C)  $\text{N}_2$
  - D)  $\text{H}_2\text{O}$
  - E) KBr

- \_\_\_\_\_ 12) Isotopes differ in the number of \_\_\_\_\_.
- A) beta particles
  - B) protons
  - C) electrons
  - D) neutrons
  - E) neutrons and protons
- \_\_\_\_\_ 13) Cesium belongs to the \_\_\_\_\_ group of the periodic table.
- A) alkali metal
  - B) alkaline earth metal
  - C) halogen
  - D) noble gas
- \_\_\_\_\_ 14) Identify an anion.
- A) An atom that has lost an electron.
  - B) An atom that has gained an electron.
  - C) An atom that has lost a neutron and a proton.
  - D) An atom that has gained a neutron.
- \_\_\_\_\_ 15) Which one of the following contains 39% carbon by mass?
- A) C<sub>2</sub>H<sub>2</sub>
  - B) CH<sub>4</sub>
  - C) CH<sub>3</sub>NH<sub>2</sub>
  - D) CO<sub>2</sub>
- \_\_\_\_\_ 16) Identify a cation.
- A) An atom that has lost an electron.
  - B) An atom that has gained an electron.
  - C) An atom that has lost a proton and a neutron.
  - D) An atom that has gained a neutron.
- \_\_\_\_\_ 17) Determine the oxidizing agent in the following reaction.
- $$\text{Ni(s)} + 2 \text{AgClO}_4(\text{aq}) \rightarrow \text{Ni}(\text{ClO}_4)_2(\text{aq}) + 2 \text{Ag(s)}$$
- A) Ag
  - B) Ni
  - C) Cl
  - D) O
  - E) This is not an oxidation-reduction reaction.
- \_\_\_\_\_ 18) Argon belongs to the \_\_\_\_\_ group of the periodic table.
- A) alkali metal
  - B) alkaline earth metal
  - C) halogen
  - D) noble gas

- \_\_\_\_\_ 19) Determine the number of protons, neutrons and electrons in the following:  
 ${}_{12}^{25}\text{X}$
- A)  $p^+ = 12$        $n^\circ = 25$        $e^- = 12$   
B)  $p^+ = 12$        $n^\circ = 12$        $e^- = 13$   
C)  $p^+ = 12$        $n^\circ = 13$        $e^- = 12$   
D)  $p^+ = 25$        $n^\circ = 12$        $e^- = 13$   
E)  $p^+ = 12$        $n^\circ = 13$        $e^- = 25$
- \_\_\_\_\_ 20) An atom of  ${}^{131}\text{I}$  contains \_\_\_\_\_ protons.
- A) 53  
B) 184  
C) 78  
D) 124  
E) 131
- \_\_\_\_\_ 21) Write a **balanced** equation to show the reaction of aqueous aluminum acetate with aqueous ammonium phosphate to form solid aluminum phosphate and aqueous ammonium acetate.
- A)  $\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_2(\text{aq}) + (\text{NH}_4)_2\text{PO}_4(\text{aq}) \rightarrow \text{AlPO}_4^{(s)} + 2 \text{NH}_4\text{C}_2\text{H}_3\text{O}_2(\text{aq})$   
B)  $\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_2(\text{aq}) + (\text{NH}_3)_2\text{PO}_4(\text{aq}) \rightarrow \text{AlPO}_4^{(s)} + 2 \text{NH}_4\text{C}_2\text{H}_3\text{O}_2(\text{aq})$   
C)  $\text{Al}(\text{CO}_3)_2(\text{aq}) + (\text{NH}_3)_2\text{PO}_4(\text{aq}) \rightarrow \text{AlPO}_4^{(s)} + 2 \text{NH}_3\text{CO}_3(\text{aq})$   
D)  $\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_3(\text{aq}) + (\text{NH}_4)_3\text{PO}_4(\text{aq}) \rightarrow \text{AlPO}_4^{(s)} + 3 \text{NH}_4\text{C}_2\text{H}_3\text{O}_2(\text{aq})$   
E)  $\text{Al}(\text{CO}_2)_3(\text{aq}) + (\text{NH}_4)_3\text{PO}_3(\text{aq}) \rightarrow \text{AlPO}_3^{(s)} + 3 \text{NH}_4\text{CO}_2(\text{aq})$
- \_\_\_\_\_ 22) Which of the following contains the MOST atoms? You shouldn't need to do a calculation here.
- A) 10.0 g Mg  
B) 10.0 g Ne  
C) 10.0 g Ca  
D) 10.0 g Rb  
E) 10.0 g Cs
- \_\_\_\_\_ 23) Determine the name for  $\text{TiCO}_3$ . Remember that titanium forms several ions.
- A) titanium (II) carbonate  
B) titanium carbide  
C) titanium carbonite  
D) titanium (II) carbonite  
E) titanium (I) carbonate
- \_\_\_\_\_ 24) Which of the following statements about subatomic particles is TRUE?
- A) A neutral atom contains the same number of protons and electrons.  
B) Protons have about the same mass as electrons.  
C) Electrons make up most of the mass of an atom.  
D) Protons and neutrons have opposite, but equal in magnitude, charges.  
E) Neutrons and electrons are found in the nucleus of an atom.

- \_\_\_\_\_ 25) Determine the name for aqueous HF.
- A) fluoric acid
  - B) fluorous acid
  - C) hydrofluorous acid
  - D) hydrogen fluoride
  - E) hydrofluoric acid
- \_\_\_\_\_ 26) The mass number is equal to
- A) the sum of the number of the electrons and protons.
  - B) the sum of the number of the neutrons and electrons.
  - C) the sum of the number of protons, neutrons, and electrons.
  - D) the sum of the number of protons and neutrons.
- \_\_\_\_\_ 27) What is the empirical formula for  $\text{Hg}_2(\text{NO}_3)_2$ ?
- A)  $\text{Hg}_2(\text{NO}_3)_2$
  - B)  $\text{HgNO}_3$
  - C)  $\text{Hg}(\text{NO}_3)_2$
  - D)  $\text{Hg}_2\text{NO}_3$
  - E)  $\text{Hg}_4(\text{NO}_3)_4$
- \_\_\_\_\_ 28) How many electrons does the  $\text{Al}^{3+}$  ion possess?
- A) 16
  - B) 10
  - C) 6
  - D) 0
  - E) 13
- \_\_\_\_\_ 29) In a chemical reaction, matter is neither created or destroyed. Which law does this refer to?
- A) Law of Definite Proportions
  - B) Law of the Conservation of Mass
  - C) Law of Modern Atomic Theory
  - D) Law of Multiple Proportions
  - E) First Law of Thermodynamics
- \_\_\_\_\_ 30) Which of the following is a molecular element?
- A) barium
  - B) argon
  - C) xenon
  - D) iodine
  - E) potassium



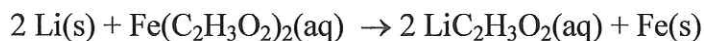
- \_\_\_\_\_ 31) Give the formula for sulfurous acid.  
A)  $\text{H}_2\text{SO}_3$   
B)  $\text{HSO}_3$   
C)  $\text{H}_2\text{SO}_4$   
D)  $\text{HSO}_4$
- \_\_\_\_\_ 32) Which of the following elements has the **least** tendency to form an ion?  
A) Ca  
B) K  
C) Kr  
D) Se
- \_\_\_\_\_ 33) Calculate the molar mass of  $\text{Ca}_3(\text{PO}_4)_2$ .  
A) 87.05 g/mol  
B) 215.21 g/mol  
C) 310.18 g/mol  
D) 279.21 g/mol  
E) 246.18 g/mol
- \_\_\_\_\_ 34) Determine the oxidation state of C in  $\text{CO}_3^{-2}$ .  
A) +4  
B) +2  
C) -2  
D) -4  
E) +6
- \_\_\_\_\_ 35) Which one of the following compounds is soluble in water?  
A)  $\text{Cu}_3(\text{PO}_4)_2$   
B)  $\text{CoS}$   
C)  $\text{Pb}(\text{NO}_3)_2$   
D)  $\text{ZnCO}_3$
- \_\_\_\_\_ 36) Write the name for  $\text{Sn}(\text{SO}_4)_2$ . Remember that Sn forms several ions.  
A) tin (I) sulfite  
B) tin (IV) sulfate  
C) tin sulfide  
D) tin (II) sulfite  
E) tin (I) sulfate

- \_\_\_\_\_ 37) How many atoms of oxygen are contained in 47.6 g of  $\text{Al}_2(\text{CO}_3)_3$ ? The molar mass of  $\text{Al}_2(\text{CO}_3)_3$  is 233.99 g/mol.
- A)  $1.23 \times 10^{23}$  O atoms
  - B)  $2.96 \times 10^{24}$  O atoms
  - C)  $2.87 \times 10^{25}$  O atoms
  - D)  $1.10 \times 10^{24}$  O atoms
  - E)  $3.68 \times 10^{23}$  O atoms
- \_\_\_\_\_ 38) Calculate the mass (in g) of  $2.1 \times 10^{24}$  atoms of W.
- A)  $3.9 \times 10^2$  g
  - B)  $2.4 \times 10^2$  g
  - C)  $3.2 \times 10^2$  g
  - D)  $1.5 \times 10^2$  g
  - E)  $6.5 \times 10^2$  g
- \_\_\_\_\_ 39) Give the formula for calcium bisulfate.
- A)  $\text{CaHSO}_4$
  - B)  $\text{Ca}_2(\text{HSO}_4)_2$
  - C)  $\text{Ca}_2\text{HSO}_4$
  - D)  $\text{Ca}(\text{HSO}_4)_2$
- \_\_\_\_\_ 40) Global warming is thought to be caused by the increase of one particular gas. Name the gas.
- A) oxygen
  - B) carbon monoxide
  - C) carbon dioxide
  - D) nitrogen
  - E) helium
- \_\_\_\_\_ 41) Determine the oxidation state of nitrogen in NO.
- A) +5
  - B) +3
  - C) 0
  - D) +2
  - E) +4
- \_\_\_\_\_ 42) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of  $\text{C}_2\text{H}_5\text{O}_2$ .
- A)  $\text{C}_2\text{H}_5\text{O}_2$
  - B)  $\text{C}_6\text{H}_{15}\text{O}_6$
  - C)  $\text{C}_3\text{H}_7\text{O}_3$
  - D)  $\text{C}_4\text{H}_{10}\text{O}_4$
  - E)  $\text{C}_8\text{H}_{20}\text{O}_8$

- \_\_\_ 43) Give a possible molecular formula for  $C_3H_5ClO$ .
- A)  $C_6H_{10}ClO_2$
  - B)  $C_5H_{10}C_{12}O_2$
  - C)  $C_6H_{10}C_{12}O_2$
  - D)  $C_6H_{10}O_2$
  - E)  $C_6H_{12}Cl_2O_2$
- \_\_\_ 44) What species is represented by the following information?
- $p^+ = 47$      $n^0 = 62$      $e^- = 46$
- A)  $Ag^+$
  - B) Nd
  - C) Pd
  - D) Ag
  - E)  $Pd^+$
- \_\_\_ 45) Ions differ in the number of
- A) electrons.
  - B) neutrons.
  - C) protons.
  - D) neutrons and protons.
  - E) electrons and protons.
- \_\_\_ 46) Give the percent yield when 28.16 g of  $CO_2$  are formed from the reaction of 4.000 moles of  $C_8H_{18}$  with 8.000 moles of  $O_2$ .
- $$2 C_8H_{18} + 25 O_2 \rightarrow 16 CO_2 + 18 H_2O$$
- A) 20.00%
  - B) 25.00%
  - C) 50.00%
  - D) 12.50%
- \_\_\_ 47) Which of the following is a precipitation reaction?
- A)  $Zn(s) + 2 AgNO_3(aq) \rightarrow 2 Ag(s) + Zn(NO_3)_2(aq)$
  - B)  $NaCl(aq) + LiI(aq) \rightarrow NaI(aq) + LiCl(aq)$
  - C)  $2 KI(aq) + Hg_2(NO_3)_2(aq) \rightarrow Hg_2I_2(s) + 2 KNO_3(aq)$
  - D)  $HI(aq) + NaOH(aq) \rightarrow NaI(aq) + H_2O(l)$
  - E) None of the above are precipitation reactions.
- \_\_\_ 48) An ionic bond is best described as
- A) the sharing of electrons.
  - B) the transfer of electrons from one atom to another.
  - C) the attraction that holds the atoms together in a polyatomic ion.
  - D) the attraction between 2 nonmetal atoms.
  - E) the attraction between 2 metal atoms.



\_\_\_\_\_ 49) Determine the reducing agent in the following reaction.



- A) O
- B) H
- C) C
- D) Fe
- E) Li

\_\_\_\_\_ 50) How many molecules of  $\text{N}_2\text{O}_4$  are in 76.3 g  $\text{N}_2\text{O}_4$ ? The molar mass of  $\text{N}_2\text{O}_4$  is 92.02 g/mol.

- A)  $5.54 \times 10^{25}$   $\text{N}_2\text{O}_4$  molecules
- B)  $7.26 \times 10^{23}$   $\text{N}_2\text{O}_4$  molecules
- C)  $1.38 \times 10^{24}$   $\text{N}_2\text{O}_4$  molecules
- D)  $4.59 \times 10^{25}$   $\text{N}_2\text{O}_4$  molecules
- E)  $4.99 \times 10^{23}$   $\text{N}_2\text{O}_4$  molecules

\_\_\_\_\_ 51) Give the name for  $\text{SnO}$ .

- A) tin (I) oxide
- B) tin (II) oxide
- C) tin (III) oxide
- D) tin (IV) oxide

\_\_\_\_\_ 52) Barium belongs to the \_\_\_\_\_ group of the periodic table.

- A) alkali metal
- B) alkaline earth metal
- C) halogen
- D) noble gas

\_\_\_\_\_ 53) Which one of the following compounds is insoluble in water?

- A)  $\text{CaCl}_2$
- B)  $\text{NaNO}_3$
- C)  $\text{PbCl}_2$
- D)  $\text{K}_2\text{CO}_3$

\_\_\_\_\_ 54) Give the mass percent of oxygen in  $\text{C}_{14}\text{H}_{19}\text{NO}_2$ .

- A) 13.72%
- B) 72.07%
- C) 8.21%
- D) 6.00%

- \_\_\_\_\_ 55) Determine the name for  $P_4O_{10}$ .
- A) phosphorus (IV) oxide
  - B) diphosphorus pentoxide
  - C) phosphorus oxide
  - D) phosphorus (II) oxide
  - E) tetraphosphorus decoxide
- \_\_\_\_\_ 56) Identify the compound with covalent bonds.
- A)  $CH_4$
  - B) Kr
  - C) KBr
  - D) Li
  - E) NaCl
- \_\_\_\_\_ 57) A covalent bond is best described as
- A) the sharing of electrons between atoms.
  - B) the transfer of electrons.
  - C) a bond between a metal and a nonmetal.
  - D) a bond between a metal and a polyatomic ion.
  - E) a bond between two polyatomic ions.
- \_\_\_\_\_ 58) What species is represented by the following information?
- $p^+ = 17$     $n^{\circ} = 18$     $e^- = 18$
- A) Cl
  - B)  $Cl^-$
  - C) Ar
  - D)  $Ar^+$
  - E) Kr
- \_\_\_\_\_ 59) How many electrons are in nickel?
- A) 28
  - B) 30
  - C) 31
  - D) 30.7
  - E) 58.7
- \_\_\_\_\_ 60) Which of the following elements is NOT a metal?
- A) Ba
  - B) Mg
  - C) Xe
  - D) Pb
  - E) Ga

- \_\_\_\_\_ 61) Identify the charges of the protons, neutrons, and electrons.  
A) protons +1, neutrons 0, electrons -1  
B) protons 0, neutrons -1, electrons +1  
C) protons -1, neutrons 0, electrons +1  
D) protons 0, neutrons +1, electrons -1  
E) protons +1, neutrons -1, electrons 0
- \_\_\_\_\_ 62) Identify the largest atom or ion of carbon.  
A)  $p^+ = 6$      $n^{\circ} = 6$      $e^- = 6$   
B)  $p^+ = 6$      $n^{\circ} = 7$      $e^- = 6$   
C)  $p^+ = 6$      $n^{\circ} = 6$      $e^- = 7$   
D)  $p^+ = 6$      $n^{\circ} = 6$      $e^- = 5$
- \_\_\_\_\_ 63) Which pair of compounds is soluble in water?  
A) AgCl and AgBr  
B) CoS and  $K_2S$   
C) NaI and  $Cu(NO_3)_2$   
D)  $NH_4NO_3$  and  $BaCO_3$
- \_\_\_\_\_ 64) Identify the description of an atom.  
A) neutrons and electrons in nucleus; protons in orbitals  
B) neutrons in nucleus; protons and electrons in orbitals  
C) protons and neutrons in nucleus; electrons in orbitals  
D) protons and electrons in nucleus; neutrons in orbitals  
E) electrons in nucleus; protons and neutrons in orbitals
- \_\_\_\_\_ 65) Determine the name for  $N_2O_5$ .  
A) dinitrogen pentoxide  
B) nitrogen oxide  
C) nitrogen (IV) oxide  
D) nitrogen (II) oxide  
E) nitrogen tetroxide
- \_\_\_\_\_ 66) Write a **balanced** equation to show the reaction of sulfurous acid with lithium hydroxide to form water and lithium sulfite.  
A)  $H_2SO_4(aq) + LiOH(aq) \rightarrow H_2O(l) + Li_2SO_4(aq)$   
B)  $H_2SO_3(aq) + 2 LiOH(aq) \rightarrow 2 H_2O(l) + Li_2SO_3(aq)$   
C)  $HSO_3(aq) + LiOH(aq) \rightarrow H_2O(l) + LiSO_3(aq)$   
D)  $HSO_4(aq) + LiOH(aq) \rightarrow H_2O(l) + LiSO_4(aq)$   
E)  $H_2S(aq) + 2 LiOH(aq) \rightarrow 2 H_2O(l) + Li_2S(aq)$

\_\_\_\_\_ 67) Calculate the atomic mass of silver if silver has 2 naturally occurring isotopes with the following masses and natural abundances:

Ag-107    106.90509 amu    51.84%

Ag-109    108.90476 amu    48.46%

A) 107.90 amu

B) 108.00 amu

C) 107.79 amu

D) 108.32 amu

E) 108.19 amu

\_\_\_\_\_ 68) What element is defined by the following information?

$p^+ = 17$      $n^{\circ} = 20$      $e^- = 17$

A) calcium

B) rubidium

C) chlorine

D) neon

E) oxygen

\_\_\_\_\_ 69) Iodine belongs to the \_\_\_\_\_ group of the periodic table.

A) alkali metal

B) alkaline earth metal

C) halogen

D) noble gas

\_\_\_\_\_ 70) Which of the following elements has chemical properties similar to tellurium?

A) fluorine

B) hydrogen

C) nitrogen

D) sulfur

### Matching

*Match the following.*

A) precipitation

B) gas evolution

C) acid-base

D) combustion

E) oxidation reduction

\_\_\_\_\_ 1)  $\text{NaCl(aq)} + \text{AgNO}_3\text{(aq)} \rightarrow \text{AgCl(s)} + \text{NaNO}_3\text{(aq)}$

\_\_\_\_\_ 2)  $\text{CH}_4\text{(g)} + 2 \text{O}_2\text{(g)} \rightarrow \text{CO}_2\text{(g)} + 2 \text{H}_2\text{O(g)}$

\_\_\_\_\_ 3)  $\text{HCl(aq)} + (\text{NH}_4)_2\text{S(aq)} \rightarrow \text{H}_2\text{S(g)} + 2\text{NH}_4\text{Cl(aq)}$

