Unit 5: Naming and Bonding Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block: \_\_\_\_

|  |
| --- |
| **Learning Targets** |
| 1. *Review: I CAN determine the number of valence electrons of main group elements using the periodic table; I CAN determine the charge (oxidation number) of a given ion using the periodic table*
 |
| 1. I CAN draw the Lewis Dot Structure of an atom; I CAN draw the Lewis Structure of an ion
 |
| 1. I CAN define and explain ionic compounds (formation and composition) and their properties; I CAN draw the Lewis Dot Structure for an ionic compound
 |
| 1. Given the two elements bonding, I CAN write the name and formula of any given ionic compound.*\*Includes simple ionic compounds, compounds with transition metals, and compounds with polyatomic ions.*
 |
| 1. I CAN write the formula (including charge) and name of the required polyatomic ions
 |
| 1. I CAN define and explain covalent molecules (formation and composition) and their properties; I CAN draw the Lewis Dot Structure for a covalent molecule*\*Includes binary acids, oxyacids, and simple straight-chained hydrocarbons (alkanes).*
 |
| 1. Given the two elements bonding, I CAN write the name and formula of any given covalent molecule.*\*Includes binary acids, oxyacids, and simple straight-chained hydrocarbons (alkanes).*
 |
| 1. I CAN define and explain structural isomers.
 |
| 1. Given the formula or name, I CAN determine if a compound contains ionic or covalent bonds.*\*Includes binary acids, oxyacids, and simple straight-chained hydrocarbons.*
 |

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| --- |
| Chemistry Important Dates!  |
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| February 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | March 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |

**Review: Valence Electrons**

Remember the number of valence electrons of a main group are counted from 1-8, left to right in groups 1 and 2, 13-18.

***Directions: On the periodic table below, label each Main Group with the number of valence electrons, then answer the question to the right of the table.***

How many valence electrons do the following atoms/ions have?

 Ca

 Ca+2

 S

 S-2

 He

 Ne

**Lewis Dot Rules for Atoms**

Electron distribution is depicted with Lewis Dot Structures (also known as electron dot structures). These are the rules for drawing Lewis Dot Structures:

1. Write the symbol of the element the Lewis Dot will represent.
2. The dots around the symbol represent the number of valence electrons that element has.
	* Be sure to follow these simple rules when adding dots around the symbol:
		1. No side receives two electrons until each side receives one (seats on a bus, remember?)
		2. Once all four sides have one electron, begin to fill the second electron spot in each pair.
		3. It does not matter which side you start on, as long as the previous two rules are fulfilled.

*Example:*

Carbon (4 valence electrons) Bromine (7 valence electrons)



***Directions: Draw the Lewis Dot Structure for the following atoms:***

H Al Cl Mg He O Si Ne

**Common Ions (Oxidation Numbers)**

Octet Rule: Each atom will gain or lose valence electrons to achieve 8 valence electrons in the outermost energy level so that they achieve the electron configuration of a Noble Gas (group 18).

Ions form by gaining or losing valence electrons to become more stable.

Cations: positively charged ions that will lose electrons to become more stable. There are more protons than electrons.

Anions: negatively charged ions that will gain electrons to become more stable. There are more electrons than protons.

***Directions: On the periodic table below, write the common ions (oxidation numbers) formed by each group. As before, ignore groups 3-12. Then, answer the question to the right of the table.***

What are the common ions formed by the following atoms?

H
Ca

Al

N

O

F

Li

**Lewis Dot Rules for Ions**

When drawing the Lewis Dot Structures, you will signify that they symbol is an ion by completing the Octet Rule using the appropriate amount of dots, then adding brackets around the symbol with the charge outside right as a superscript.

Example:

Magnesium (+2 common ion) Bromine (-1 common ion)



***Directions: Draw the Lewis Dot Structures for the following common ions:***

S Al ClN

**Notes on Ionic Compound Properties (Write the examples!)**

**Notes on Ionic Compound Formation (Draw the Examples!)**

**Notes on Drawing Ionic Compounds (Lewis Dot Structures) (Draw the Examples!)**

**Ionic Bond Formation**

Ionic bonds occur between a cation and an anion. Lewis Dot Structures are used to show how ionic bonds form. If an element has a bonding electron in the Lewis Dot Structure, it will gain or lose those electrons through bonding and form a lone pair.

Step 1: Draw the Lewis Dot Structures for both atoms

 Example: Lithium and Nitrogen



Step 2: Show the transfer of electrons from the cation to the anion (metal to the nonmetal) by drawing an arrow to the location it would fit to complete the Octet Rule.



Step 3: Are all the bonding electrons paired up? If not, continue to add more cations or anions until both have a complete octet. If the compound is neutral, write the Lewis Dot Structure for each ion.



Step 4: Draw the ionic bond formed between each ion after they combine.

3[Li]+1

Step 5: Write the neutral chemical formula. The subscript shows how many of each element participates in the bonds.

 Li3N

***Directions: Draw the ionic bonding between the elements in each example below. Use the example as a guide and complete all steps (1-5).***

Potassium and Bromine

Beryllium and Oxygen

Lithium and Sulfur

Aluminum and Chlorine

Calcium and Phosphorous

**Compound Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***Directions: Using the table below, determine a process to go from Name to Chemical Formula, and back. Record your findings at the bottom of the page. Make sure your process is CLEAR!***

Hints: What do you notice about the element named first? What do you notice about the ending to the name? What do you notice about the ions involved? What do you notice about the final chemical formula?

|  |  |  |
| --- | --- | --- |
| **Name** | **Formation** | **Chemical Formula** |
| sodium chloride | Na+1 and Cl-1 | NaCl |
| sodium sulfide | 2Na+1 and S-2 | Na2S |
| sodium nitride | 3Na+1 and N-3 | Na3N |
| magnesium chloride | Mg+2 and 2Cl-1 | MgCl2 |
| magnesium oxide | Mg+2 andO-2 | MgO |
| magnesium phosphide | 3Mg+2 and 2P-3 | Mg3P2 |
| aluminum chloride | Al+3 and 3Cl-1 | AlCl3 |
| aluminum oxide | 2Al+3 and 3O-2 | Al2O3 |
| aluminum nitride | Al+3 and N-3 | AlN |

|  |  |
| --- | --- |
| Process from Name to Chemical Formula | Process from Chemical Formula to Name |
|  |  |

**Binary Ionic Compounds Practice**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Elements**Circle the Metal | **Oxidation #’s** | **Lewis Structure of Compound** | **Balanced Formula** | **Name of Compound** |
| Ca & Br |  |  |  |  |
| O & Na |  |  |  |  |
| Li & P |  |  |  |  |
| S & Al |  |  |  |  |

**Write the formula for these compounds:**

gallium chloride \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

beryllium oxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

potassium nitride \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

rubidium selenide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

lithium iodide\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

barium bromide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_’

aluminum phosphide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

magnesium nitride \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Name the following compounds:**

K2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ NaF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

KI \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mg3P2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Al2Se3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Rb3N \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GeCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ GaBr3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Na2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Sr3N2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Compound Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***Directions: Using the table below, determine a process to go from Name to Chemical Formula, and back. Record your findings at the bottom of the page. Make sure your process is CLEAR!***

|  |  |  |
| --- | --- | --- |
| **Name** | **Formation** | **Chemical Formula** |
| iron (II) oxide | Fe+2 and O-2 | FeO |
| iron (III) oxide | Fe+3 and O-2 | Fe2O3 |
| copper (I) bromide | Cu+1 and Br-1 | CuBr |
| copper (II) bromide | Cu+2 and Br-1 | CuBr2 |
| copper (I) oxide | Cu+1 and O-2 | Cu2O |
| tin (II) sulfide | Sn+2 and S-2 | SnS |
| tin(IV) sulfide | Sn+4 and S-2 | SnS2 |

|  |  |
| --- | --- |
| Process from Name to Chemical Formula | Process from Chemical Formula to Name |
|  |  |

**Compound Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***Directions: Using the table below, determine a process to go from Name to Chemical Formula, and back. Record your findings at the bottom of the page. Make sure your process is CLEAR!***

ammonium NH4+1 acetate C2H3O2-1

hydroxide OH-1 phosphate PO4-3

carbonate CO3-2 nitrate NO3-1

 sulfate SO4-2

|  |  |  |
| --- | --- | --- |
| **Name** | **Formation** | **Chemical Formula** |
| sodium nitrate | Na+1 and NO3-1 | NaNO3 |
| magnesium nitrate | Mg+2 and NO3-1 | Mg(NO3)2 |
| aluminum nitrate | Al+3 and NO3-1 | Al(NO3)3 |
| ammonium acetate | NH4+1 and C2H3O2-1 | NH4C2H3O2 |
| ammonium carbonate | NH4+1 and CO3-2 | (NH4)2CO3 |
| ammonium phosphate | NH4+1 and PO4-3 | (NH4)3PO4 |

|  |  |
| --- | --- |
| Process from Name to Chemical Formula | Process from Chemical Formula to Name |
|  |  |

**Transition Metals and Polyatomic Ionic Compounds**

**Write the correct formula for:**

1) magnesium oxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) lithium bromate \_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) titanium (IV) nitride \_\_\_\_\_\_\_\_\_\_\_

4) aluminum sulfate \_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) iron (III) iodide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) mercury (II) chlorate \_\_\_\_\_\_\_\_\_\_\_\_

7) sodium sulfite \_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) radium bromide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) magnesium borate \_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) vanadium(III) nitride \_\_\_\_\_\_\_\_\_\_\_

 **Write the correct formula for:**

11) iron(III) chloride \_\_\_\_\_\_\_\_\_\_\_\_\_\_

12) copper(II) sulfate \_\_\_\_\_\_\_\_\_\_\_\_\_\_

13) lead(II) bromide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

14) calcium iodide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

15) potassium nitrate \_\_\_\_\_\_\_\_\_\_\_

16) tin(IV) oxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

17) manganese(III) chromate \_\_\_\_\_\_\_\_

18) beryllium nitrite \_\_\_\_\_\_\_\_\_\_\_

19) gold(III) oxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_

20) cobalt(II) phosphate \_\_\_\_\_\_\_\_\_\_\_

 **Write the correct name for:**

1) MgS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) NiBr \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) Ba3N2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) Al2O3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) ZnS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) NiF2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7) V2S \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) FeCl2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) TiO \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) AlP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **Write the correct name for:**

11) Cu(NO2)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12) CuBr \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13) GaN \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14) Fe2(CO3)3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15) Ag(CN)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16) SnO \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17) Cu2S \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18) Mg3(PO3)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19) Zn3N2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20) Ni(IO3)3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Notes on Covalent Molecule Properties**

**Notes on Drawing Covalent Molecules (Lewis Dot Structures) (Draw the Examples!)**

**Notes on Covalent Molecule Formation (Draw the Examples!)**

**Covalent Bonds: Formulas, Names, Drawings**

1. H2O Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. NH3 Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. PCl3 Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. O2 Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. CO2 Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. CH4 Draw Lewis dot structure with electrons being shared Draw molecule with bond
2. H2S Draw Lewis dot structure with electrons being shared Draw molecule with bond
3. CH2Br2  Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. HCN Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. CH3Cl Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. OF2 Draw Lewis dot structure with electrons being shared Draw molecule with bond

1. SO2 Draw Lewis dot structure with electrons being shared Draw molecule with bond

**Compound Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***Directions: Using the table below, determine a process to go from Name to Chemical Formula, and back. Record your findings at the bottom of the page. Make sure your process is CLEAR!***

|  |  |
| --- | --- |
| **Name** | **Chemical Formula** |
| Carbon Monoxide | CO |
| Dihydrogen monoxide | H2O |
| Trinitrogen dichloride | N3Cl2 |
| Tetraphosphorous decaoxide | P4O10 |
| Hexanitrogen pentafluoride | N6F5 |
| Heptahydrogen octasulfide | H7S8 |
| Nonanitrogen trioxide | N9O3 |

|  |  |
| --- | --- |
| Process from Name to Chemical Formula | Process from Chemical Formula to Name |
|  |  |

**Covalent Molecules Names and Formulas****Write the name of each of the given molecules:**

1. SF6 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. P2Br8 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. SiF3 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. N2O 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. P4O10 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. N2O5 6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. SO2 7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. CBr4 8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Write the chemical formula for each of the given names:**

9. nitrogen triiodide 9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. dinitrogen tetroxide 10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. boron tetrahydride 11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. carbon monoxide 12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. dihydrogen monoxide 13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. tricarbon hexiodide 14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. phosphorus trichloride 15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. diphosphours heptoxide 16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Compound Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***Directions: Using the table below, determine a process to go from Name to Chemical Formula, and back. Record your findings at the bottom of the page. Make sure your process is CLEAR!***

|  |  |
| --- | --- |
| **Name** | **Formulas** |
| Methane | CH4 |
| Ethane | C2H6 |
| Propane | C3H8 |
| Butane | C4H10 |
| Pentane | C5H12 |
| Hexane | C6H14 |

|  |  |
| --- | --- |
| Process from Name to Chemical Formula | Process from Chemical Formula to Name |
|  |  |

**Notes on Structural Isomers (Draw the Examples!)**

**Write the chemical name for each of the given the hydrocarbons:**

Methane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Propane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Heptane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ethane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Octane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Butane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Write the chemical formula for each of the given hydrocarbons:**

C3H8 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C6H14 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C2H6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C9H20 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C10H22 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C4H10 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Draw the five structural isomers of hexane:**

**Mixed Compounds Review: Naming and Formulas**

 *Name the following chemical compounds:*

1) C3P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) Ca(C2H3O2)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) P2O5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) K2SO3  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) FePO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) C2H6  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7) Al2(CO3)3  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) ZnSO4  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) (NH4)­3P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) CuOH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11) C5H12 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12) SO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Write the formulas for the following chemical compounds:*

13) silicon dioxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14) barium sulfite \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15) manganese (II) phosphide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16) propane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17) diboron tetrabromide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18) lead (II) nitrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19) ammonium fluoride\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20) triboron hexoxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21) heptane\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22) chromium (III) hydroxide\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23) tin (IV) selenide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

24) carbon tetrachloride \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Compound Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***Directions: Using the table below, determine a process to go from Name to Chemical Formula, and back. Record your findings at the bottom of the page. Make sure your process is CLEAR!***

ammonium NH4+1 acetate C2H3O2-1

hydroxide OH-1 phosphate PO4-3

carbonate CO3-2 nitrate NO3-1

 sulfate SO4-2

|  |  |  |
| --- | --- | --- |
| **Name** | **Formation** | **Chemical Formula** |
| Hydrochloric Acid | H+1 and Cl-1 | HCl |
| Hydrobromic Acid | H+1 and Br-1 | HBr |
| Hydrofluoric Acid | H+1 and F-1 | HF |
| Acetic Acid |  H+1 and C2H3O2-1 | HC2H3O2 |
| Nitric Acid | H+1 and NO3-1 | HNO3 |
| Phosphoric Acid | H+1 and PO4-3 | H3PO4 |
| Carbonic Acid | H+1 and CO3-2 | H2CO3 |
| Nitrous Acid | H+1 and NO2-1 | HNO2 |
| Phosphorous Acid | H+1 and PO3-3 | H3PO3 |
| Sulfurous Acid | H+1 and SO3-2 | H2SO3 |

|  |  |
| --- | --- |
| Process from Name to Chemical Formula | Process from Chemical Formula to Name |
|  |  |

**Acids Names and Formulas Practice**

1. Nitric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Hydrosulfuric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Chloric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Acetic acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Hydrobromic acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Sulfurous acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Chlorous acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Chromic Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Hydrochloric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Phosphoric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Nitrous acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. Hydrofluoric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. Hydroiodic acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. Phosphorous acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. Carbonic acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Write the correct name for the following acids:

16. HClO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17. HC2H3O2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. H3PO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. HCl  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. H2SO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21. HNO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. HI \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23. HF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

24. H3PO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25. HClO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 5 Review: Naming and Bonding**

1. What is the term for the number of valence electrons gained or lost during bonding?

2. How do you use the periodic table to determine the number of valence electrons?

3. Describe the characteristics of an ionic compound:

4. Describe the characteristics of a covalent compound:

5. Write the formula for the following compounds:

A) Potassium Nitrate B) Trinitrogen Hexasulfide C) Gold (III) Phosphide D) Nitrous Acid

6. Name these compounds:

A) C4Br2  B) Li3PO4 C) H3P D) Fe(NO2)2

7. An atom has 22 protons and a mass number of 53, and has a 2+ charge. Write this element in isotopic notation.

8. What does the Roman numeral represent in a chemical compound?

9. Where are the metals found on the periodic table?

10. What is a structural isomer?

11. Where are the transition metals located?

12. What element do all acids start with?

13. Write the formula for these compounds:

A) Sulfuric Acid B) Nickel (IV) Chromate C) Sulfur Trioxide D) Lithium Carbonate

14. Isotopes are forms of the same element, but with different number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. If you see a compound’s name that has prefixes at the beginning, then what type of bonding will it be?

16. List the prefixes for covalent compounds 1-10:

17. Name the following Compounds:

A) HF B) Mn2O C) B2O7 D) H2SO3 E) Ca2N3

18. Which way do periods on the periodic table go? What does the period number indicate?

19. Which way do groups go on the periodic table? What does the group number indicate?

20. Write these formulas:

A) Hydrophosphoric Acid B) Carbonic Acid C) Sulfur Heptabromide D) Zinc (IV) Manganate

21. The sum of the oxidation numbers in an ionic compound will always equal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Answer the following questions for the formula Ca3(PO4)2**

23. What type of compound is this? Justify your response:

24. How many elements are in the above compound?

25. How many total atoms are in the bond?

26. Write is the oxidation number for the metal in each of the following compounds:

A) ZnO B) FePO4 C) CoF2 D) Mn(SO4)2 E) FeN

27. Write the oxidation number for the following elements:

A) Bromine B) Calcium C) Indium D) Phosphorus E) Iodine

28. Name and Write the following for the compounds below

A) Ba(CN)2 B) Ammonium Hydroxide

 C) P3O D) Zinc (II) Sulfide

 E) Hg3N F) Pentanitrogen Heptaoxide

 G) H2CO3 H) Hydrophosphoric Acid