Unit 2: Matter: Elements, Mixtures, and Compounds
Part 1 – Notes: Introduction to Matter

Objectives: Define, identify, and classify: matter, element, mixture, compound, heterogeneous, homogeneous, chemical/physical property, chemical/physical change, phase, change of state, boiling, vaporization, condensation, freezing, melting, sublimation, deposition, filtration, distillation, atom, molecule, ion, net charge, ion, and polyatomic ion.
Differentiate between and classify a given item as: (a) chemical or physical change/property, (b) element, mixture or compound, (c) heterogeneous or homogeneous, and (d) pure substance or mixture.
Explain how mixtures may be separated.

Text Reference: Sections 2.1 through 2.4 – pages 29-43

Everything is either _____ or _____

Matter is

The **common phases** of matter are: _____, _____, _____

Phase:

Properties of phases of matter:

Mater falls into two main categories: ***Pure substances*** & ***Mixtures***
Pure Substance:

Pure substances may be either: ***Elements*** or ***Compounds***
Elements:

Compounds:

Differences between an element and a compound:

Mixtures may be: ***Heterogeneous*** or ***Homogeneous***
Heterogeneous:

Homogeneous:

Another name for a homogeneous mixture is a _____.

Difference between compound and mixture:

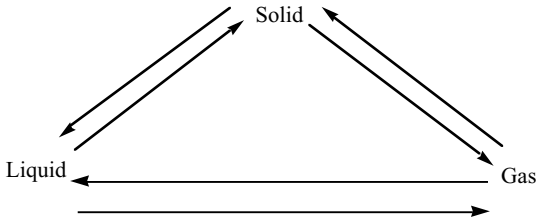
A ***physical property*** is

A ***physical change*** is

A ***chemical property*** is

A ***chemical change*** is

There are _____ changes that occur as substances change between the three **phases** of matter.



Filtration:

Distillation:

<u>Atoms and Ions</u>

An atom is the smallest particle of a(n)

The three basic parts of an atom are:

Two subatomic particles with roughly the same *mass*:

Two subatomic particles with the same numerical value but opposite charge are:

Compared with the mass of the other subatomic particles we say the mass of the _____ is insignificant.

We say that its mass is _____.

Most of the mass of an atom comes from:

Most of the volume of an atom is:

What is center of the atom called and what is housed there?

What is the "function" of the proton?

The number of protons is the same for any atom of a given element. What happens if the number of protons changes?

Net zero charge means

If an atom has a net zero charge, what two particles are present in equal numbers?

If an atom does NOT have a net zero charge it is an ION.

An ION is

How does an atom become an ion?

What is a positively charged ion called and how is it formed?

What is a negatively charged ion called and how is it formed?

An atom has 45 p^+, 57 n^o, and 42 e^-. It's net charge: _____ Element: _____ Atom or ion? _____

How do you know what element it is?

A polyatomic ion is

The charge on a polyatomic ion is

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 1 – Assignment: Introduction to Matter

1. Are the following chemical properties/changes (***CHEM***) or physical properties/changes (***PHYS***)?

a.	dry ice gradually vaporizes	b.	hair curls when humidity increases
c.	meat blackens when cooked on a grill	d.	salt water boils at a higher temp than fresh water
e.	a light bulb glows	f.	milk curdles when vinegar is added
g.	butter turns rancid when left at room temp.	h.	steel in a car has rust spots
i.	spilled acid burns holes in cotton jeans	j.	sweat cools the body as it evaporates
k.	oil feel slippery	l.	aspirin reduces a fever
m.	milk of magnesia neutralizes stomach acid	n.	diamonds melt at 6800^{o}C

2. Identify the following as mixtures (***MIX***) or pure substances (***PURE***).

a.	milk	b.	teaspoon of sugar
c.	sugar dissolved in water	d.	aluminum foil
e.	salad dressing	f.	wood

3. Identify the following as heterogeneous (***HETERO***) or homogeneous (***HOMO***).

a.	beach sand	b.	sodium chloride dissolved in water
c.	air in our classroom	d.	rust scraped from a car bumper
e.	window glass	f.	sterling silver bracelet

4. a. A pure _____ contains only one type of element.

   b. A pure _____ contains only one type of molecule.

5. Gold jewelry can be 10 karat, 12 karat, 14 karat, or any other karat number between zero and 24. Does this indicate gold used in jewelry is a pure substance or a mixture? Explain your answer choice.

6. How would a sample of the compound carbon dioxide collected in your school differ from a sample of carbon dioxide collected from a school in Australia?

7. Draw a sketch of a magnified view (showing atoms/molecules) of:
   a. a heterogeneous mixture of two compounds
   b. a homogeneous mixture of an element and compound

8. A clear liquid is in an open container is allowed to evaporate. After three days, a solid residue is left. Was the original liquid an element, a compound, or a mixture? How do you know?

9. How many phases does every solution have?

10. When powdered iron is left to the air, it rusts. Explain why the rusts weighs more than the original powdered iron.

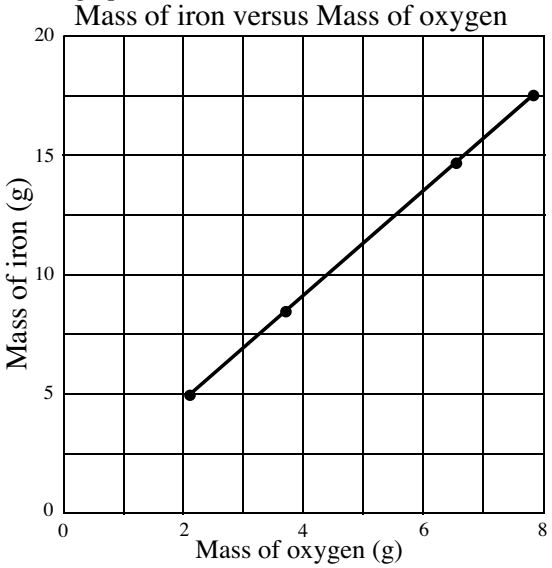
11. A friend observes a burning candle and comments that the wax is lost as the candle burns. Having studied the law of conservation of mass, how would you correct your friend?

12. Explain why this statement is false. "Because there is no change in composition during a physical change, the appearance of the substance will not change."

13. The mass of the elements iron and oxygen were measured in four samples of a rust-colored substance believed to be a compound. The amount of iron and oxygen found in each sample is shown on the graph.

   a. Do you think each sample is of the same compound? Explain.

   b. Another sample of similar material was found to contain 9.9 g of iron and 3.4 g of oxygen. Is this the same substance as the other four? Explain.



Unit 2: Matter: Elements, Mixtures, and Compounds
Part 2 – Notes: Compounds and Their Formation

Objectives: Define, explain, and identify: molecule, molecular compounds, ion, cation, anion, monatomic ion, polyatomic ion, ionic compound, chemical formula, molecular formula, formula unit, law of definite proportions, and law of multiple proportions.
Relate metals and nonmetals to: (a) cations and anions and (b) ionic and molecular compounds.
Distinguish between ionic and molecular compounds.
Distinguish between chemical formulas and molecular formulas.
Demonstrate the law of definite proportions for a compound using experimental data.
Determine the charge on a main block ion through its position on the periodic table.

Text Reference: Sections 6.1 through 6.3 – pages 133-148

Noble Gases –

Located . . .

They are the only elements that tend to exist . . .

Molecule:

Diatomic Molecules:

Elements that exist as diatomic molecules when uncombined (in their free state):

Molecular Compounds:

Melting points and boiling points:

At room temperature, molecular compounds exist as . . .

Composed of . . .

Smallest unit of a molecular compound is . . .

The molecules of a given molecular compound are all the same; but they differ from molecules of all other molecular compounds.

Ions:

Ionic Compounds:

Melting points and boiling points:

At room temperature, ionic compound generally exist as . . .

Composed of . . .

Smallest unit of an ionic compound is . . .

Chemical formula:

Molecular Formula:

Difference between a chemical formula, a molecular formula, and a formula unit:

Law of Definite Proportions:

In any sample of a chemical compound, the elements are always combined in the same proportion by mass.

Early 1800s – John Dalton's studies

- Dalton studied pairs of compounds that contained the same elements but had different physical and chemical properties
- Water (H_2O) and hydrogen peroxide (H_2O_2) both contain hydrogen and oxygen – but have very different properties
- In every sample of hydrogen peroxide, there is a 16:1 ratio between the mass of oxygen to the mass of hydrogen
- In every sample of water, there is a 8:1 ratio between the mass of oxygen to mass of hydrogen
- If a sample of hydrogen peroxide has the same mass as a sample of water, the ratio of masses of oxygen in the compounds is exactly 2:1.

Example:

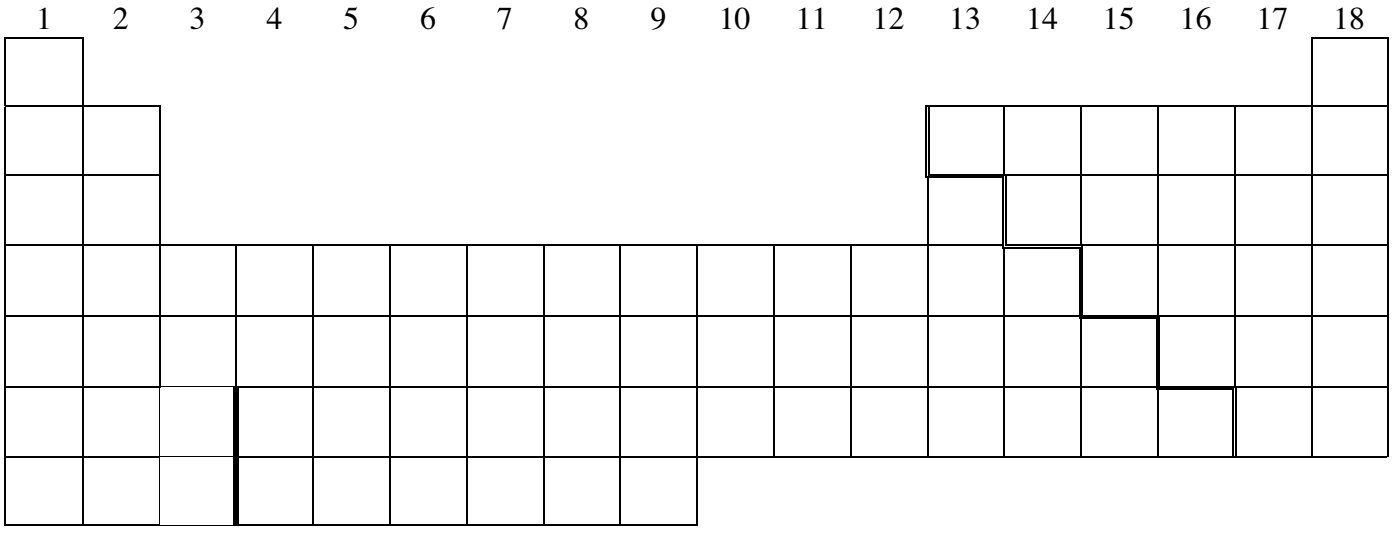
Law of Multiple Proportions:

Whenever two elements form more than one compound, the different masses of one element that combine with the same mass of the other element are in the ratio of small whole numbers.

Example 1: Carbon reacts with oxygen to form two compounds. Compound A contains 2.41 g of carbon for each 3.22 g of oxygen. Compound B contains 6.71 g of carbon for each 17.9 g of oxygen. What is the lowest whole-number mass ratio of carbon that combines with a given mass of oxygen?

Example 2: In the compound nitrous oxide, also known as laughing gas, and used as an anesthetic in dentistry, the mass ratio of nitrogen to oxygen is 7:4. A 68-g sample of a compound composed of nitrogen and oxygen contains 42 g of nitrogen. Is this sample nitrous oxide?

Using the periodic table to determine main group ion charges:



Unit 2: Matter: Elements, Mixtures, and Compounds
Part 2 – Assignment: Compounds and Their Formation

Answer the following questions or solve the following problems. You must show all work, set-ups, units, etc.

1. Lead form two compounds with oxygen. One compound contains 2.98 g of lead combined with 0.461 g of oxygen. The other compound contains 9.89 g of lead with 0.763 g of oxygen. What is the lowest whole-number mass ratio of lead in the two compounds that combines with a given mass of oxygen?

2. Which law is illustrated by this statement: "In every sample of carbon monoxide, the mass ratio of carbon to oxygen is 3:4"?

3. Which law is illustrated by this statement: "When carbon and oxygen form the compounds carbon monoxide and carbon dioxide, the different masses of carbon that combine with the same mass of oxygen are in the ratio of 2:1"?

4. If ionic compounds are composed of charged articles (ions), why isn't every ionic compound either positively or negatively charged?

5. Would you expect the following pairs of elements to combine chemically to form an ionic or a molecular compound?

a.	Li and S	b.	O and S	c.	Al and O
d.	F and Cl	e.	I and K	d.	H and N

6. Textbook – Page 166 – Question 50. Complete that question here.
   a.

   b.

   c.

7. Textbook – Page 167 – Question 72. Complete parts a – c of the question here.
   a.

   b.

   c.

8. Just for practice: A 2.00-kg sample of bituminous coal is composed of 1.30 kg of carbon, 0.20 kg of ash, 0.15 kg of water, and 0.35 kg of volatile (gas-forming) material. Using this information, determine how many kilograms of carbon are in 125 kg of this coal?

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 3 – Notes: Ionic Compounds – Types I and II

Objectives: Define, explain, and identify: ionic compound and binary ionic compound.
Determine rules for writing binary ionic formulas based on a compound's net zero charge.
Apply the rules for writing formulas for binary ionic compounds.
Write names for binary ionic compounds and determine a method for differentiating between various transition ions.
Explain when, where, and why Roman numerals are used in writing compound names.

Text Reference: Section 6.4 – pages 149-153

An **ion** is a _____formed by _____
_____. Often a single element becomes an ion. However sometimes a group of atoms covalently bonds to form a single ion. This group of bonded atoms carries a single charge. This is known as a polyatomic ion.

Ions with opposite charges join together to form **ionic compounds**. We will learn how to write formulas for these compounds. We will also learn how to name these compounds.

TYPE I – Binary Ionic Compounds

Binary Ionic Compound: an ionic compound containing of ions of two types of elements

When **naming** binary ionic compounds, follow these rules:

1. *The name of the first ion is the same as the name of its element on the periodic table.*
2. *The name of the second ion has the same beginning as the name of its element, but its ending changes to* ***–ide****.*
   The ***–ide*** ending generally signifies that a single element has become a negative ion.

Let's name some binary ionic compounds: CaF_2 _____

Li_3N _____

Now we will write the formulas for binary ionic compounds.

When **writing formulas** for binary ionic compounds, remember these two basic rules:

1. *The number of positive charges must equal (balance) the number of negative charges.*
2. *The positive ion is written first, then the negative ion is written second.*

Example 1: If the sodium ion has a charge of +1 and the chlorine ion has a charge of –1, then how many sodium ions are required to balance how many chloride ions? In other words, what is the formula of the compound formed by sodium and chloride?

Example 2: If the potassium ion has a charge of +1 and the oxygen ion has a charge of –2, then how many potassium ions are required to balance how many oxide ions? In other words, what is the formula of the compound formed by potassium and oxide?

Example 3: If the aluminum ion has a charge of +3 and the bromine ion has a charge of –1, then how many aluminum ions are required to balance how many bromide ions? In other words, what is the formula of the compound formed by aluminum and bromide?

Example 4: If the barium ion has a charge of +2 and the sulfur ion has a charge of –2, then how many barium ions are required to balance how many sulfide ions? In other words, what is the formula of the compound formed by barium and sulfide?

Example 5: If the aluminum ion has a charge of +3 and the oxygen ion has a charge of –2, then how many aluminum ions are required to balance how many oxide ions? In other words, what is the formula of the compound formed by aluminum and oxide?

TYPE II – Binary Ionic Compounds with Ions of Multiple Charge

Most often, elements that gain or lose electrons to become ions tend to gain or lose the same number of electrons each time they become an ion. Sodium always loses a single electron and oxygen always gains two electrons. However, not every element acts this way. There are a certain elements, mostly located in the center section of the periodic table, that do not always lose the same number of electrons. The elements that lose different numbers of electrons are always metals, always lose electrons, always become positive ions, and are always the first part of the compound.

When using these ions in naming compounds, you need to distinguish between which ion is being used.

Examine the following compounds made with copper ions and chloride ions. Let's write names for them.

$CuCl$ = _____ & $CuCl_2$ = _____

We need to find some way to differentiate between these two compounds.
There are two copper ions: copper (I) and copper (II). The formulas for these ions are Cu^{+1} and Cu^{+2}, respectively
Notice that the ions' names as written on your ion list have Roman numerals in parentheses. What do these numbers mean?

The Roman numerals indicate _____.

General Rule: Elements that are transition metals require Roman numerals in parentheses to **designate their charge**.

Exceptions: **Tin** and **lead** are NOT transition metals – but they are *wanna-bes*. Although they are not officially transition metals they NEED Roman numerals in parentheses in names of their compound.

Silver and **zinc** are part of the transition metals, but each one loses a set amount of electrons and do NOT require Roman numerals in the names of their compounds. Silver always forms a +1 ion while zinc always forms a +2 ion.

Examples: Let's give names to the following compounds.

FeO = _____ Fe_2O_3 = _____

PbF_2 = _____ PbF_4 = _____

Examples: Let's write the formulas for the following compounds.

iron (III) sulfide _____ tin (II) chloride _____

copper (I) oxide _____ tin (II) oxide _____

tin (IV) oxide _____ lead (IV) fluoride _____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 3 – Assignment: Ionic Compounds – Types I and II

If the name is given, supply the formula. If the formula is given, supply the name.

1.	potassium bromide	_____	21.	NaCl	_____
2.	lithium iodide	_____	22.	$AlBr_3$	_____
3.	magnesium chloride	_____	23.	CaS	_____
4.	hydrogen sulfide	_____	24.	HCl	_____
5.	sodium oxide	_____	25.	Ca_3P_2	_____
6.	calcium fluoride	_____	26.	K_2O	_____
7.	beryllium phosphide	_____	27.	Li_3N	_____
8.	aluminum fluoride	_____	28.	Al_2O_3	_____
9.	magnesium nitride	_____	29.	H_2S	_____
10.	sodium phosphide	_____	30.	Na_2Te	_____
11.	copper (II) nitride	_____	31.	$PtCl_2$	_____
12.	strontium arsenide	_____	32.	W_2O_5	_____
13.	lead (II) chloride	_____	33.	PbO	_____
14.	tin (II) phosphide	_____	34.	$CaBr_2$	_____
15.	lead (IV) oxide	_____	35.	$CuCl_2$	_____
16.	cobalt (II) iodide	_____	36.	CuCl	_____
17.	iron (II) oxide	_____	37.	SrS	_____
18.	iron (III) oxide	_____	38.	$CoBr_2$	_____
19.	manganese (II) oxide	_____	39.	Cr_2O_3	_____
20.	nickel (II) chloride	_____	40.	Zn_3N_2	_____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 4 – Notes: Ionic Compounds – Type III

Objectives: Define, explain, and identify: ternary ionic compound and polyatomic ion.
Determine rules for writing ternary ionic formulas based on a compound's net zero charge.
Apply the rules for writing formulas for ternary ionic compounds.
Write names for ternary ionic compounds and differentiate between various transition ions where necessary.
Count the number of each type of atom in ternary ionic and binary ionic formulas.

Text Reference: Section 6.4 – pages 154-156

Type III Ionic Compounds – Compounds with Polyatomic Ions

Polyatomic ions are formed when _____.

When these polyatomic ions form compounds, they are easy to name and easy to write formulas. Their names do NOT change.

Examples: Let's give names for the following compounds. (Remember to check if they need Roman numerals.)

$BaCO_3$ = _____ $CaSO_4$ = _____

K_2SO_4 = _____ Na_3PO_4 = _____

Examples: Let's give formulas for the following compounds.

tin (II) sulfate = _____ potassium nitrate = _____

aluminum phosphate = _____ zinc carbonate = _____

However, what happens when you need more than one of these polyatomic ions in your compound? They are still easy to name, but require an addition to their formula.

Examples: Let's give the formulas for the following compounds.

aluminum sulfate = _____ calcium hydroxide = _____

iron (II) nitrate = _____ ammonium carbonate = _____

Examples: Let's give names for the following compounds.

$Mg(HCO_3)_2$ = _____ $Zn_3(PO_4)_2$ = _____

$Fe(NO_3)_3$ = _____ $Cu(C_2H_3O_2)_2$ = _____

Counting Atoms in Formulas

The parentheses around a polyatomic are present to keep the polyatomic ion together. Any subscript **OUTSIDE** the parentheses applies to each element inside the parentheses. Be sure to also account for the subscripts **INSIDE** the parentheses – which apply ONLY to the element they follow.

Let's count atoms:

$Al_2(SO_4)_3$ Al = _____ S = _____ O = _____

$(NH_4)_3PO_4$ N = _____ H = _____ P = _____ O = _____

$Ca(HCO_3)_2$ Ca = _____ H = _____ C = _____ O = _____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 4 – Assignment: Ionic Compounds – Type III

If the name is given, supply the formula. If the formula is given, supply the name.

1. hydrogen sulfite _____
2. barium hydroxide _____
3. calcium acetate _____
4. lithium sulfate _____
5. iron (II) thiosulfate _____
6. lead (IV) carbonate _____
7. potassium permanganate _____
8. silver hypochlorite _____
9. copper (II) perchlorate _____
10. ammonium sulfide _____
11. nickel (II) hydroxide _____
12. ammonium dichromate _____
13. aluminum cyanide _____
14. potassium peroxide _____
15. aluminum chromate _____
16. chromium (II) carbonate _____
17. copper (II) sulfide _____
18. ammonium phosphide _____
19. potassium oxalate _____
20. iron (III) acetate _____
21. $Zn(HCO_3)_2$ _____
22. H_3PO_4 _____
23. $CsOH$ _____
24. $Ca(OH)_2$ _____
25. $Fe_2(CO_3)_3$ _____
26. $FeCO_3$ _____
27. $Li_2C_2O_4$ _____
28. $Al_2(CrO_4)_3$ _____
29. $Ca(IO_3)_2$ _____
30. $NaC_2H_3O_2$ _____
31. Na_2SO_3 _____
32. K_2CO_3 _____
33. NH_4I _____
34. $Ca(SCN)_2$ _____
35. $KHCO_3$ _____
36. Li_3AsO_4 _____
37. Cu_3PO_4 _____
38. SnO_2 _____
39. $Ca(NO_3)_2$ _____
40. $Al_2(S_2O_3)_3$ _____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 5 – Notes: Binary Molecular Compounds

Objectives: Define, identify, and explain: binary molecular compound, molecule, nonmetal, and prefix.
List the prefixes used in naming molecular compounds and state their numeric values.
Explain why, where, and when prefixes are used in naming binary molecular compounds.
Differentiate between molecular compounds and ionic compounds and their naming processes.
Apply the rules for naming binary molecular compounds and writing binary molecular formulas.

Text Reference: Section 6.5 – pages 158-159

Binary Molecular Compounds are compounds composed of two *nonmetallic* elements.

Two characteristics of binary molecular compounds affect the naming and formula writing of these compounds.

1. These compounds are composed of molecules and the ionic charges of the representative elements are NOT used in writing the formulas of these compounds.
2. When two nonmetallic elements combine, they often do so in more than one way. For example, the elements carbon and oxygen combine to form different gaseous compounds and an ion, CO, CO_2, and CO_3^{-2}. They each have different physical and chemical properties.

At first glance, it might seem satisfactory to give the name "carbon oxide" to a binary compound formed by the combination of carbon and oxygen atoms. This could have some severe consequences, however. Sitting in a room with moderate levels of carbon oxide (CO_2) in the air does not present any problems. We exhale this as a product of our metabolism. If however, we sit in a room with moderate levels of carbon oxide (CO) in the air, we would die from asphyxiation. CO is a poisonous gas that interferes with our body's ability to transport oxygen to body cells. Obviously we need to distinguish between these two compounds when naming them.

Prefixes are used to show how many atoms of each element are present in a molecule (and formula) of a binary molecular compound.

The names of binary molecular compounds have this general form:

(prefix + element name) (prefix + element root + *-ide*)

Prefix	***Number***	***Prefix***	***Number***
Mono-	1	Hexa-	6
Di-	2	Hepta-	7
Tri-	3	Octa-	8
Tetra-	4	Nona-	9
Penta-	5	Deca-	10

The two compounds of carbon and oxygen are CO = monocarbon monoxide and CO_2 = monocarbon dioxide.

NOTE: The vowel at the end of the prefix may be dropped when the name of the first element begins with a vowel. For example, it is monoxide, NOT monoxide.

The prefix *mono-* may be omitted if there is only one atom of the **first** element (and the first element only). So CO may be more commonly named carbon monoxide. The prefix is NEVER dropped for the second element.

When you are naming compounds, be sure to check if they are both nonmetals. If they are, use the prefixes and IGNORE THE CHARGES OF THE IONS.

Examples: Name the following compounds or give the correct formulas.

N_2O _____ carbon disulfide _____

PCl_3 _____ carbon tetrachloride _____

SF_6 _____ dinitrogen tetrahydride _____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 5 – Assignment: Binary Molecular Compounds

If the name is given, supply the formula. If the formula is given, supply the name.

1. dichlorine monoxide _____
2. sulfur hexachloride _____
3. diphosphorus pentoxide _____
4. phosphorus trichloride _____
5. dinitrogen pentoxide _____
6. antimony pentasulfide _____
7. selenium tetrafluoride _____
8. phosphorus pentabromide _____
9. silicon dioxide _____
10. oxygen difluoride _____

11. ClO_2 _____
12. CS_2 _____
13. N_2O _____
14. $AsCl_5$ _____
15. SbF_3 _____
16. P_3N_5 _____
17. TeI_4 _____
18. CCl_4 _____
19. SiC _____
20. IBr_3 _____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 6 – Notes: Naming Acids

Objectives: Develop and explain rules for naming acids writing formulas for acid formulas.
Define acid.
Text Reference: Section 6.5 – page160

Acids are a group of compounds that are given special treatment in naming. There are various definitions of acids that will be explored in later chapters. For now, ***acids*** are *molecular compounds that give off hydrogen ions when dissolved in water.*

The formulas of acids are of a general form H_NX, where *X* is a monatomic or polyatomic anion and *N* represents the subscript of the hydrogen required to balance the anion and have a neutral compound. We have previously named the compound HCl hydrogen chloride. When the compound HCl is dissolved in water, it is named as an acid. Other compounds such as HNO_3 exist only in water solution. They are always named as an acid.

Consider the acid H_NX as dissolving in water. The acid can be named using rules that focus on the ending of the anion in the acid.

1. When the anion (X) ends in *–ide*, the acid name begins with the prefix *hydro-*. The stem of the anion has the suffix *–ic* and it is followed by the word *acid*. Thus HCl (X = chloride), dissolved in water, is named *hydro*chlor*ic acid*. H_2S (X = sulfide) is *hydro*sulfur*ic acid*. These are generally binary acids. (The main exception being HCN. HCN (X = cyanide) is *hydro*cyan*ic acid*.
2. When the anion ends in *–ite*, the acid name is the stem of the anion with the *–ous*, followed by the word *acid*. H_2SO_3 (X = sulfite) is sulfur*ous acid*. HClO (X = hypochlorite) is hypochlor*ous acid*.
3. When the anion ends in *–ate*, the acid name is the stem of the anion with the suffix *–ic*, followed by the word *acid*. HNO_3 (X = nitrate) is nitr*ic acid*. $HClO_4$ (X = perchlorate) is perchlor*ic acid.* H_2SO_4 (X = sulfate) is sulfur*ic acid*. (Note that *hydro-* is not used with anions ending in ate *and ite.*

*** (Note the difference between sulfuric acid and hydrosulfuric acid.)

Examples: If the name is given, supply the formula. If the formula is given, supply the name.

1. hydrofluoric acid _____
2. hydrobromic acid _____
3. perchloric acid _____
4. chlorous acid _____
5. acetic acid _____
6. sulfurous acid _____
7. hydrocyanic acid _____
8. nitrous acid _____
9. HCl _____
10. HI _____
11. $HClO_3$ _____
12. HClO _____
13. H_2SO_4 _____
14. H_3PO_4 _____
15. HNO_3 _____
16. H_2CO_3 _____

Unit 2: Matter: Elements, Mixtures, and Compounds
Part 6 – Assignment: Chemical Compounds

If the name is given, supply the formula. If the formula is given, supply the formula.

1. sodium nitrite _____
2. iron (III) hydroxide _____
3. aluminum hydroxide _____
4. ammonium thiocyanate _____
5. dinitrogen tetrahydride _____
6. ammonium oxalate _____
7. zinc acetate _____
21. N_2O_5 _____
22. FeO _____
23. H_2CO_3 (acid) _____
24. $Ca(MnO_4)_2$ _____
25. $Ca_3(PO_4)_2$ _____
26. Cl_2O_7 _____
27. Na_2S _____

8. copper (I) oxide _____

9. potassium peroxide _____

10. potassium bromate _____

11. antimony (III) oxalate _____

12. hydrocyanic acid _____

13. silver sulfide _____

14. calcium selenide _____

15. copper (II) nitrate _____

16. nitrous acid _____

17. magnesium cyanide _____

18. tin (II) bromate _____

19. lead (II) sulfite _____

20. barium phosphide _____

28. $Fe(ClO_2)_3$ _____

29. $Be(BrO_3)_2$ _____

30. $(NH_4)_2SO_4$ _____

31. H_2SO_3(acid) _____

32. $Zn(NO_3)_2$ _____

33. $CuSO_4$ _____

34. N_2H_4 _____

35. NaOH _____

36. $PbCl_2$ _____

37. K_3As _____

38. $Mg(OH)_2$ _____

39. $HClO_3$(acid) _____

40. $Cu(SCN)_2$ _____

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41. mercury (I) cyanide _____

42. acetic acid _____

43. iron (III) acetate _____

44. potassium hypochlorite _____

45. aluminum bromate _____

46. iron (III) dichromate _____

47. ammonium sulfate _____

48. phosphorus pentabromide _____

49. manganese (II) iodate _____

50. calcium thiocyanate _____

51. carbon disulfide _____

52. sodium peroxide _____

53. phosphoric acid _____

54. ammonium phosphide _____

55. dinitrogen monoxide _____

56. tellurium tetriodide _____

57. aluminum hydrogen carbonate _____

58. lead (IV) chromate _____

59. NH_4NO_2 _____

60. $Ca(HCO_3)_2$ _____

61. NH_4IO_3 _____

62. Hg_2I_2 _____

63. HClO (acid) _____

64. PbO_2 _____

65. KSCN _____

66. I_4O_9 _____

67. Li_2O_2 _____

68. $Co(OH)_2$ _____

69. K_2SO_3 _____

70. Cu_2S _____

71. $KHSO_4$ _____

72. $(NH_4)_2S$ _____

73. $Fe_2(CrO_4)_3$ _____

74. NaClO _____

75. P_3N_5 _____

76. $Ca(SCN)_2$ _____