

**Review Package #1**

**Matter and Its Changes  
Nomenclature**

## **1. Matter and Its Changes:**

### **A. Matter: (text pgs. 65-73)**

- definition of matter
- states of matter – solid, liquid, gas, plasma
- properties of matter – physical properties (hardness, malleability, ductility, luster, viscosity, diffusion, vapor, vapor pressure, boiling point, melting point, freezing point)
  - chemical properties
- changes in matter – physical and chemical changes
- Law of Conservation of Matter (mass)

### **B. Classification of Matter (text pgs. 74-76)**

- Matter Map –
- differences between heterogeneous and homogeneous mixtures
- solvent, solute, aqueous solution
- atom, ion, molecule

### **C. Separation Techniques for Mixtures (text pgs. 77-79)**

- know the techniques and when they are used/what they separate (mechanical separation, evaporation, filtration, floatation, settling, electrolysis, centrifugation, distillation, crystallization, chromatography)

## **2. Nomenclature:**

### **A. Names and Formulae of Ionic and Molecular Compounds (text pgs. 231-234, 244-247)**

- properties of ionic compounds vs. molecular compounds
- writing formulae for ionic and covalent compounds
- naming ionic and covalent compounds
- names and formulae for ionic hydrates

### **B. Names and Formulae of Acids and Base compounds (text pgs. 248-249)**

- properties of acid and base compounds
- rules for naming acids

Matter:

1. Define the term “matter”.

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2. Differentiate between an atom, ion and molecule (hint, use their definitions).

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Mixtures vs. Pure Substances:

1. Match each separation technique with its appropriate description.

<u>Technique</u>	<u>Description</u>
___ centrifugation	A. components of a mixture separate into layers on their own
___ chromatography	B. solid component of the mixture becomes trapped in a screen, allowing the liquid component to pass through
___ crystallization	C. oil, detergent, or some other chemical is added to a mixture, air is forced through the mixture as a means of stirring, and the desired component is skimmed off the top
___ distillation	D. mixture is spun at high speeds creating a force which pulls heavier solid particles towards the bottom of the container
___ electrolysis	E. the mixture is heated until a liquid component reaches its boiling point and is evaporated, leaving the other component behind
___ filtration	F. the mixture is concentrated and cooled until the solid component slowly forms at the bottom of the container
___ floatation	G. the mixture is applied to a solid support and separated into its components by a solvent which carries the various components up the solid support at different rates
___ settling	H. a process in which an electric current is applied to a sample, decomposing the sample into its component elements

2. State three things that distinguish a pure substance from a mixture (consider nature, properties)

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3. Describe what a MECHANICAL MIXTURE is (its nature and properties), provide an example, and state the separation method that should be used to isolate its component parts.

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4. How is it possible to determine whether a pure substance is an element or a compound? Provide an example of an element and a compound.

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5. How can you determine whether a material is “homogeneous” or “heterogeneous”?

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6. Sketch the phase diagram that would be produced when solid nitrogen is heated. Label all states and phase changes.

## Ionic Compounds:

1) Compare the following properties of both IONIC and MOLECULAR compounds:

- (a) Component elements (metal vs nonmetal)
- (b) Type of chemical bonding (ionic vs covalent)
- (c) Most likely states at room temperature (solid, liquid, gas)
- (d) General trend in melting point temperatures
- (e) General trend in electrical conductivity

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2) Write the chemical formulae resulting from the combination of the following ions.

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|---------------------|-----------------|-------|---------------------|-----------------------------|-------|
| a) $\text{Na}^+$    | $\text{O}^{2-}$ | _____ | c) $\text{Sr}^{2+}$ | $\text{Br}^-$               | _____ |
| b) $\text{Au}^{3+}$ | $\text{S}^{2-}$ | _____ | d) $\text{Pb}^{4+}$ | $\text{C}_2\text{O}_4^{2-}$ | _____ |

3) Write the correct name for each of the following ionic compounds.

- |                          |       |                                 |       |
|--------------------------|-------|---------------------------------|-------|
| a) $\text{Li}_2\text{O}$ | _____ | c) $\text{Mg}_3\text{N}_2$      | _____ |
| b) $\text{CoCl}_3$       | _____ | d) $\text{Cr}_3(\text{PO}_4)_2$ | _____ |

4) Write the correct formula for each of the following ionic compounds.

- |                           |       |                           |       |
|---------------------------|-------|---------------------------|-------|
| a) Cesium iodide          | _____ | d) Aluminum oxide         | _____ |
| b) Strontium cyanide      | _____ | e) Iron (III) hydroxide   | _____ |
| c) Copper (I) bicarbonate | _____ | f) Potassium permanganate | _____ |

5) Write the correct name for each of the following ionic hydrates.

- a)  $\text{Cd}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$   
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- b)  $\text{NaSCN} \cdot 5\text{H}_2\text{O}$

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### Acids and Bases:

1. State three properties of acids and three properties of bases. (you might need your textbook)

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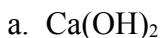
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2. Write the correct names for the following bases.

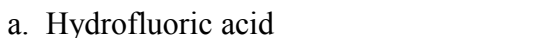


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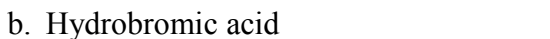


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3. Provide the missing formula or name for the following simple (binary) acids.



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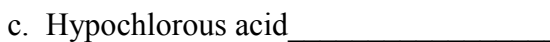
4. Provide the missing formula or name for the following complex acids.



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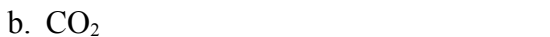
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### Molecular Compounds:

1. Write the correct name for each of the following molecular compounds.



2. Write the correct formula for each of the following molecular compounds.

a. Silicon disulphide \_\_\_\_\_

b. Carbon tetrachloride \_\_\_\_\_

c. Oxygen gas \_\_\_\_\_

d. Triarsenic pentabromide \_\_\_\_\_

e. Dicarbon hexahydride \_\_\_\_\_

f. Iodine heptachloride \_\_\_\_\_

Mixed Naming:

1) Provide the correct name for each of the following compounds.

a) CsBr \_\_\_\_\_

c)  $\text{H}_2\text{SO}_4$  \_\_\_\_\_

b) ICl \_\_\_\_\_

d)  $\text{Cu}(\text{NO}_3)_2$

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