



1. A 1.0 g sample of hydrogen reacts completely with 19.0 g of fluorine to form a compound of hydrogen and fluorine.

What is the percent by mass of each element in the compound?

$$\frac{1.0 \text{ gram H}}{20.0 \text{ grams total}} \times 100 =$$

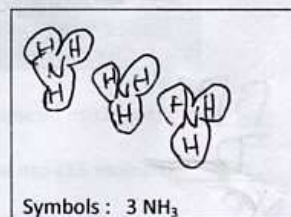
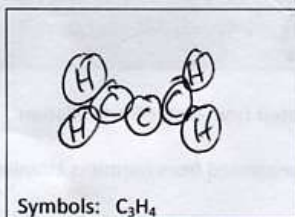
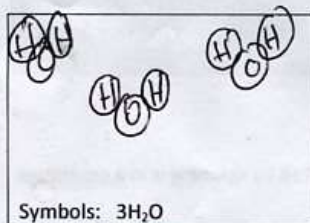
$$\frac{19.0 \text{ grams F}}{20.0 \text{ grams total}} \times 100 =$$

- Answer:
2. What are the two types of mixtures?  
hetero, homo
3. What are the two types of substances?  
ELEMENTS, COMPOUND
4. If you have two balloons at STP, and one is 5L volume and the other is 15 L volume, what Avogadro's Hypothesis say about the number of gas molecules in the two balloons?  
The 15 L has triple the number of particles

Write whether each change is physical or chemical

5. chemical Grass growing
6. Physical distilling soda in a distillation apparatus to separate the water from the sugar
7. physical paper being torn into very small pieces

Draw each



8. When bromine is by itself, with no other elements, how many atoms of bromine will be in that molecule? (1 / 2 / variable)

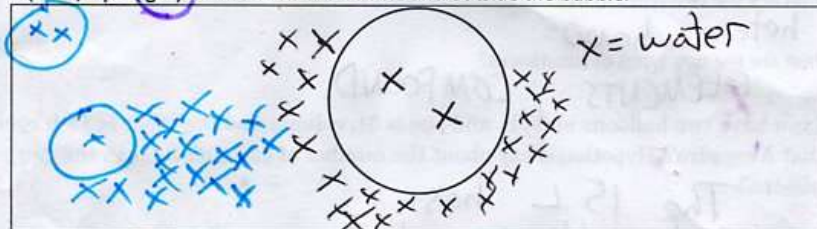
9. When bromine is in a compound, with one or more other elements, how many atoms of bromine will be in that molecule? ( 1 / 2 / variable )
10. When hydrogen is in a compound, with one or more other elements, how many atoms of hydrogen will be in that molecule? ( 1 / 2 / variable )
11. When oxygen is by itself, with no other elements, how many atoms of oxygen will be in that molecule? ( 1 / 2 / variable )

12. If two balloons at STP are the same size, but contain different substances, and the balloon of Substance A is exactly twice as heavy as the balloon of Substance B, what does Avogadro's hypothesis say about the number of molecules in the two balloons?

SAME # OF PARTICLES

13. When water is heated over a fire, bubbles form. This is a (physical/chemical) change. We know this because the the bubbles are (still the same substance / a new substance with new properties)

14. Draw a particle picture of boiling water. Clearly show what the formula and phase (solid/liquid/gas) are of inside the bubble and outside the bubble.



3) From memory, when pure, the following elements exist as pairs:

"MISTER Hoffenbrick" =  $\text{H}_2\text{O}_2$   $\text{N}_2$   $\text{Br}_2$   $\text{I}_2$   $\text{Cl}_2$

OR DRAW A 7 ON THE PERIODIC TABLE

Bronze contains 90 to 95 percent copper and 5 to 10 percent tin. Because these percentages can vary, bronze is classified as

- 1) a compound      3) a mixture  
2) an element      4) a substance

For each mixture separation below, choose which property each separation relies on.

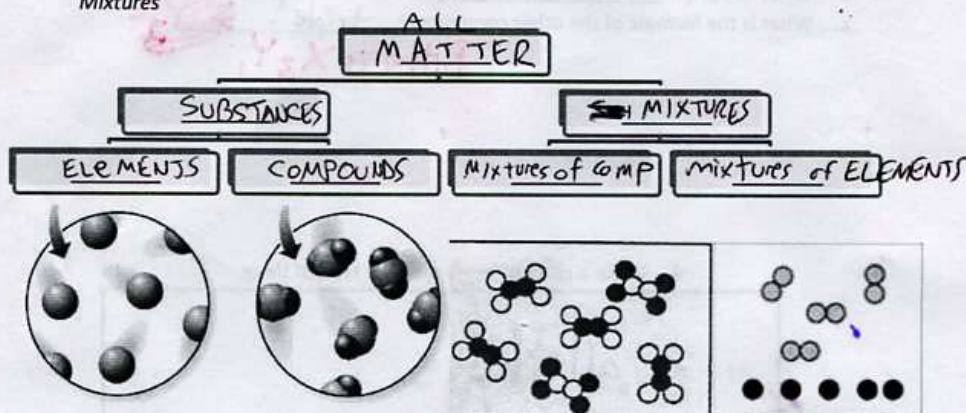
For your answer in each question write one of these properties:

(BP) different boiling points (S) different solubilities (MP) different melting points (D) different densities

- BP Ethanol can be separated from water by distillation
- D Uranium 235 can be separated from harmless Uranium 238 by spinning it in a centrifuge
- MP Mountain Dew will be sweeter if you freeze it and remove the ice crystals that form.
- S Muddy salt water can be made transparent by pouring it through a filter.

# ANSWER KEY

1. Into the blanks below write the following words (use each word or phrase only once): *Mixtures, Mixtures of Compounds, Mixtures of Elements, All Matter, Substances, Compounds, Elements, Mixtures*



1. If a small crumb of aspirin has a mass of 0.5405 grams and contains 0.3243g of carbon, 0.0242g of hydrogen, and 0.192g of oxygen, calculate

a. the percent of oxygen in aspirin:

$$\frac{.192 \text{ g}}{.5405 \text{ g total}} \times 100 = 35.5\% \text{ oxygen}$$

b. the percent of carbon in aspirin:

$$\frac{.3243 \text{ grams C}}{.5405 \text{ grams total}} \times 100 = 60.00\% \text{ carbon}$$

2. **Orange Compound:** 25.0 g of Cl / 44.0 g of Fe

**Red Compound:** ~~6.56~~ g of Cl / 34.4 g of Fe  
 58.6

$$1.70 \div 31.4$$

$$1.70 \div 1.7$$

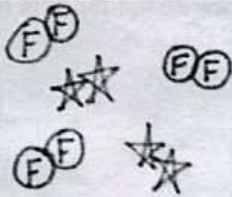
a. Determine the ratio  $\frac{\text{mass Cl}}{\text{mass Fe}}$  in each compound. Orange  $\frac{58.6 \text{ Cl}}{\text{Fe}}$  Red  $\frac{\text{Cl}}{\text{Fe}}$

b. Which is  $\text{Fe}_2\text{Cl}_2$ ? ORANGE

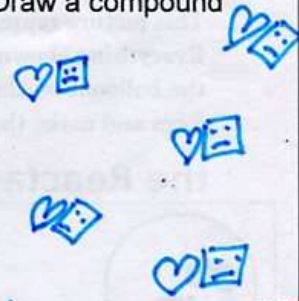
c. What is the formula of the other compound?  $\text{FeCl}_3$

Make a particle picture in each box.  
 Follow Avogadro's Hypothesis: make double sized boxes contain double the number of particles. The first box has been done for you

Draw five particles that are a mixture of elements



Draw a compound



(5 PARTICLES, OBEYS AVOGADRO)

Draw a mixture of compounds



Draw a substance that is not a compound.

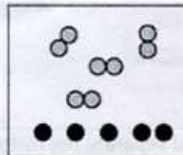
(Remember Avogadro!)

it's a substance since every chunk has the same formula.



Mark the best description of this box:

- a substance
- a mix of substances

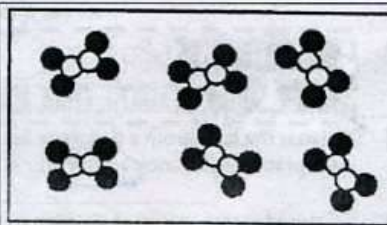


Mark the best description of this box:

- contains compounds
- contains elements
- contains compounds and elements

Mark the best description of this box:

- a substance
- a mix of substances



Mark the best description of this box:

- contains compounds
- contains elements
- contains compounds and elements

18. What is Avogadro's hypothesis?

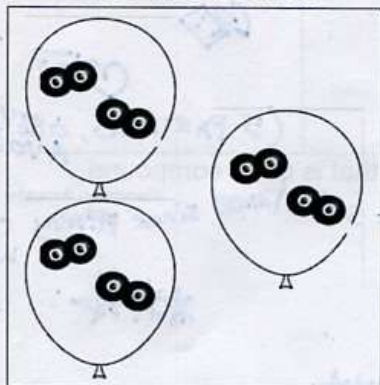
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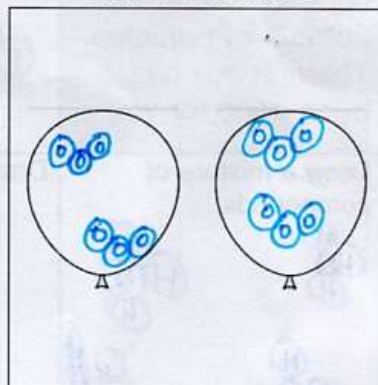
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1. This picture represents the before and after of a chemical change. Everything shown is at the same pressure, temperature, and volume. Inside the balloons on the right draw an appropriate number of molecules that could form and make the balloons this size.

the Reactant

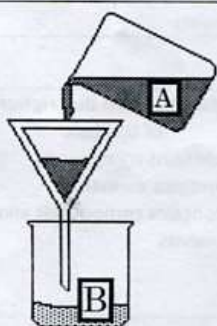


the Product



4. Complete the table with different processes to separate mixtures

PROCESS	What it is used for	Examples
	Used for separating a <b>solid</b> from a liquid	Separating SAND from water.
	Used to obtain the <b>solute</b> from a solution	for obtaining SALT from salty water
	Used to obtain the <b>solvent</b> from a solution	for obtaining pure water from sea water
	Used to separate out one colour from a mixture of colours	for separating out the colours in black ink



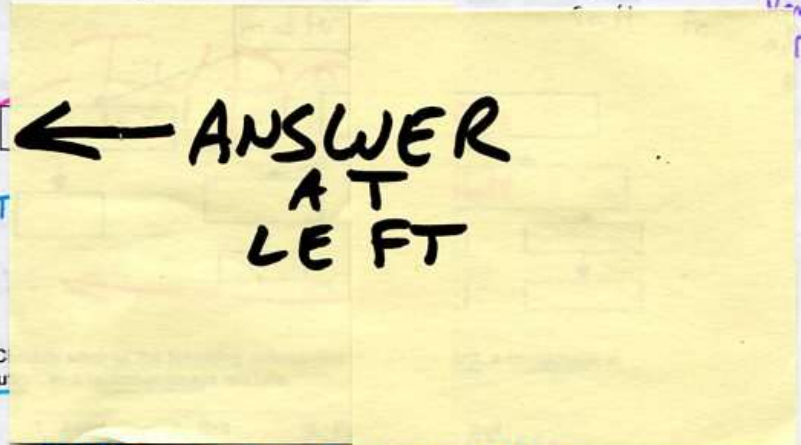
1. Could this method separate the hydrogen from oxygen in  $H_2O$ ?  
yes / no
2. Could this method separate salt from water in ocean water?  
yes / no

**INGREDIENTS:**

WATER, SUGAR, DEXTROSE, CITRIC ACID, SALT,

3. Above is the label from a Gatorade bottle. Is Gatorade a substance, mixture, or element?
4. If Gatorade were placed at position A, how many substances would later appear at B?  
(0 / 1 / 2 / 3 / 4 / 5)
5. k

2. Complete the diagram with the following words: salt, paper, oil+vinegar, air, heterogeneous, compound, element.



3. C  
solu

also called homogeneous

5. Soda [SKIP]	6. Pure Air Homogeneous MIX	7. Carbon Dioxide COMPOUND	8. Gold ELEMENT
9. Bronze SOLUTION	10. Oxygen ELEMENT	11. Salad Dressing Hetero MIX	12. Salt Water SOLUTION HOMOGENEOUS

Process	Used for	Examples
FILTRATION	Used for separating a liquid from a solid	Separating sand from water
DISTILLATION	Used to obtain a liquid from a homogeneous mixture (or solution)	for obtaining pure water from sea water
CHROMATOGRAPHY	Used to separate out one color from a mixture of colors	for separating out the colors in ink
CENTRIFUGE	For separating out a heavier substance from a lighter one	moving Uranium 238 away from Uranium 235