


# April 10, 2019

## Pass in Case Studies

### Intro to Chemistry

### Warm-Up

The element  is often called the most expensive substance in the world (as much as \$68 million for one gram.)

## Chemistry Review

Chemistry: is the study of matter, its properties, and its changes or transformations

Matter: anything that has mass and takes up space

Matter can be described in various ways.

**States of Matter**

Viscosity

Ductility

Hardness

# Physical Properties

a characteristic of matter that is often observed or measured (color, odour, texture, lustre, clarity etc). We are describing the substance in some way using our senses.

malleability

**Melting and Boiling Points**

Density

Solubility

Crystal form

## Chemical Properties

Describes the behavior of the substance when it reacts with another substance to become a new substance.

For example, dynamite explodes because it combines with oxygen. The reaction produces new substances.



## Physical Change

a change in the state or form of a substance that does not change the original substance

the substance involved remains the same substance (no new substance is formed), even though it may change forms or states.

***The six physical changes are:***

Melting, boiling, freezing, condensation, sublimation, dissolving

**Most physical changes are easy to reverse.**

## Chemical Change

the change of a substance into one or more different substances with different properties

**Most chemical changes are hard to reverse because something new was made. Chemical changes ALWAYS involve the creation of a new substance.**

***Examples of chemical changes:***

Burning, cooking and rusting.

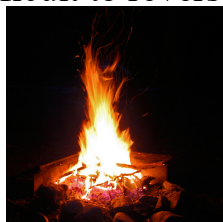
There are various ways to determine if a chemical change has occurred

i.e.

a new color



change is difficult to reverse



heat or light given off



bubbles are formed



Chemical changes can be shown in a chemical equation.

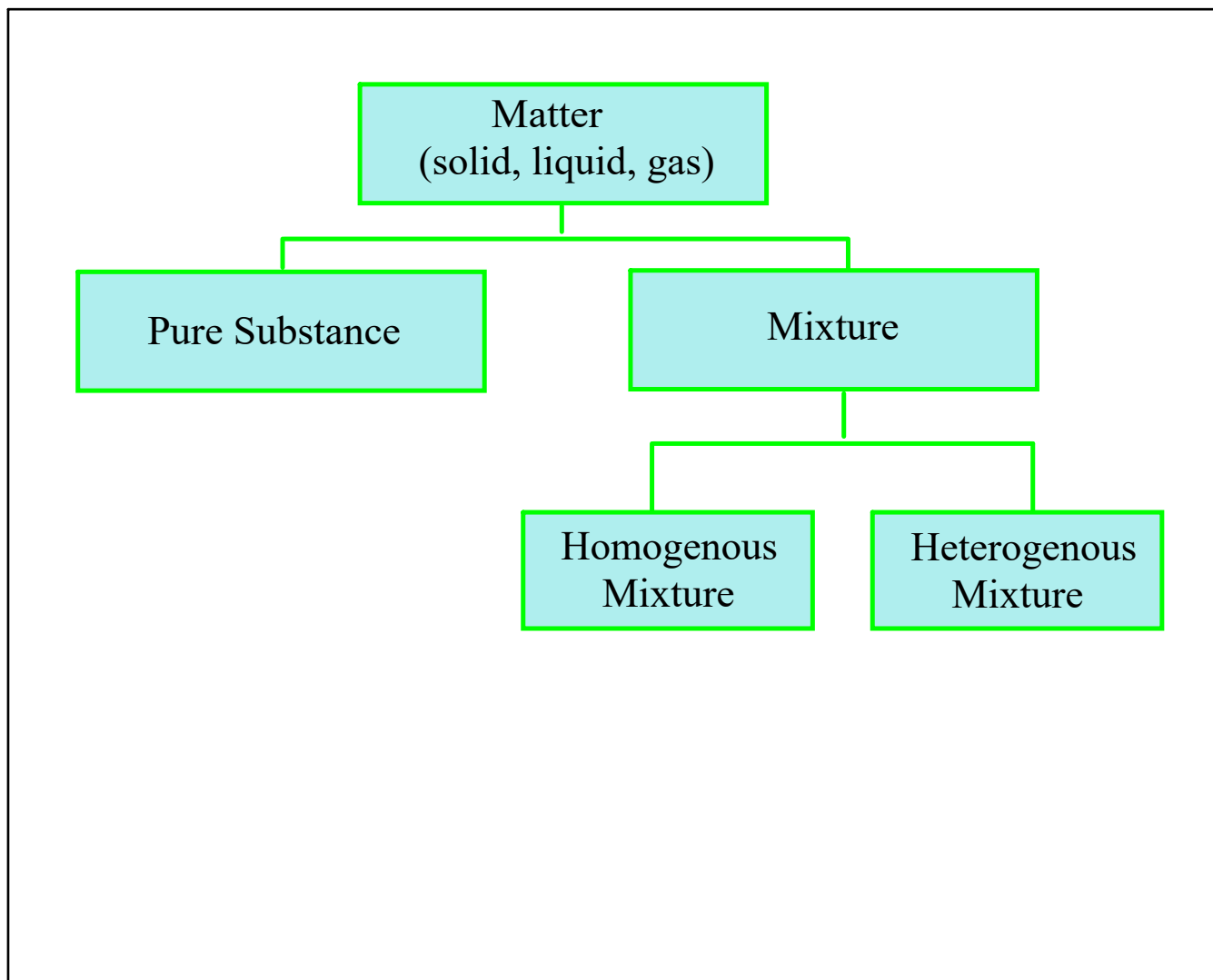
Ex. Iron + oxygen  $\Rightarrow$  Iron (III) oxide



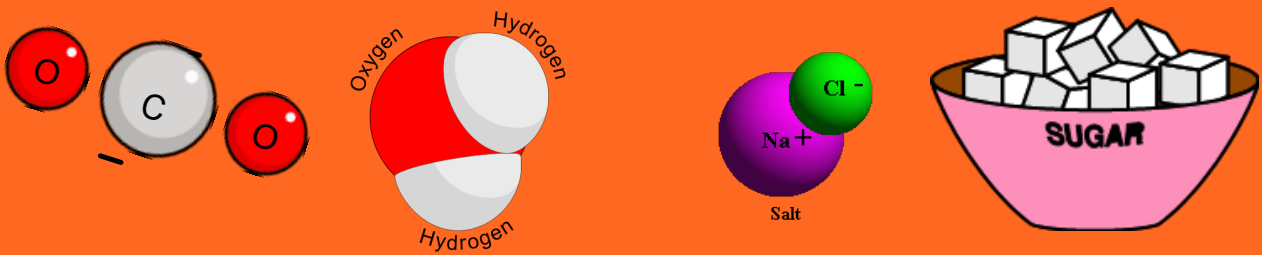
**reactants**  
(starting materials)



**products**  
(new materials)



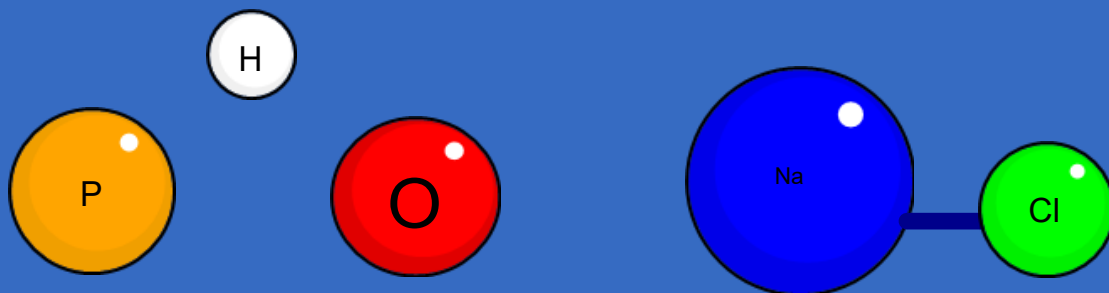




**Pure substance:** a substance that contains only one kind of particle. Example: sugar, water, carbon dioxide and salt.

**Mixtures:** a substance that contains two different pure substances or types of particles. Example: a glass of milk, a hamburger with toppings, a cookie or pizza



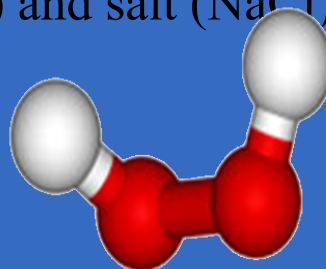
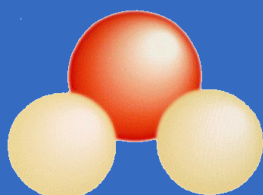


**Atom:** a particle in an element. Particles in the particle theory are called atoms. Example: In water there are two hydrogen atoms and one oxygen atom.

**Molecule:** a combination of two or more atoms. Molecules can be made up of all the same kind of atom like  $O_2$  or different atoms like  $H_2O$ .

**Elements:** pure substances that cannot be broken down into simpler substances. example: hydrogen, oxygen, carbon, phosphorus

**Compounds:** pure substances that contain two <sup>or</sup> more different elements. example: water ( $H_2O$ ) and salt ( $NaCl$ ).



Read p. 172-174  
Answer the following  
Questions  
p. 175 #1, 2, 4, 5