

## Types of Change

### Physical Change vs Chemical Change

Define **Physical Change** and give some examples:

- changes affecting the form of a chemical substance
- are used to separate mixtures into their component compounds

Define **Chemical Change** and give some examples:

- a sometimes irreversible chemical rxn involving the rearrangement of atoms of 1 or more substances
- results in a change in their chemical properties
- results in the formation of a new substance

1) **Heating Iodine**

The formula for iodine is  $I_2$  (diatomic molecule)

Iodine is a solid at room temperature.

Its colour is dark purple - black

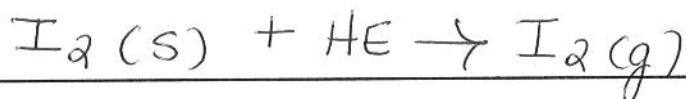
Place the sealed tube of iodine into a hot water bath. This adds heat energy to the iodine.

This is an endo-thermic process.

What happened as a result of heating the iodine?

a purple vapour formed

Write the equation for what happened to the iodine using proper subscripts:



This was a physical change because no new substance was made  $\Rightarrow$  only a change of state

Was anything new made? No!

## 2a) Iron and Sulfur--The Mixture

Describe iron filings (Fe) greyish pieces of metal

Describe sulfur (S<sub>8</sub>) yellow powder

What is special about iron? it is ferromagnetic

What does a mixture of iron and sulfur look like? yellow-greyish amorphous mixture

The mixing of iron and sulfur is a physical change because no

new substances were made & it could be separated using a magnetic

Mechanical mixtures like iron and sulfur can be separated by physical means.

How can iron and sulfur be separated and why? use a magnet to

attract the ferromag iron filings

2b) Heating a mixture of Iron and Sulfur

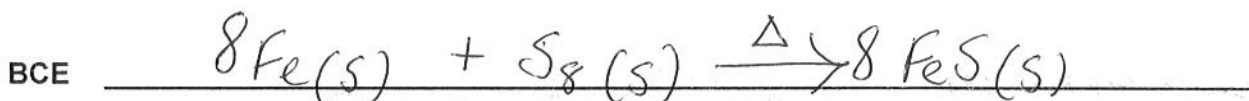
What happened as the mixture of iron and sulfur was heated? glowed red hot

gases given off

What did the resulting product look like? greyish rock

Explain what happened and why with the magnet and the product. no

attraction to the magnet = no longer iron => new substance



3) Mixing Calcium Carbonate and Hydrochloric Acid

Describe the marble chips ( $\text{CaCO}_3$ ) whitish rocks

Describe HCl clear soln

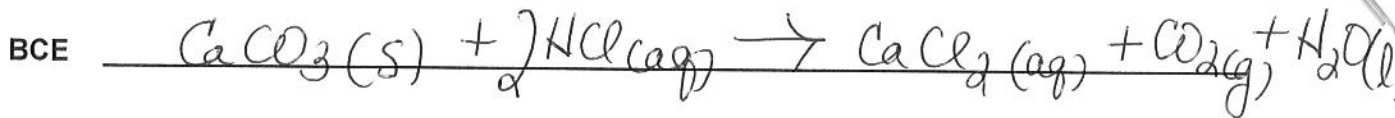
Add one or two marble chips to a test tube containing a few mL of hydrochloric acid.

What evidence was there that a chemical change took place? bubbling

Insert a plastic pipet just over the reaction and squeeze to suck up (aspirate) some of the gas being produced.

Release the gas into a test tube containing limewater.

What happened and why? clear LW -> cloudy



4) **Mixing Calcium Chloride and Sodium Hydroxide Solutions**

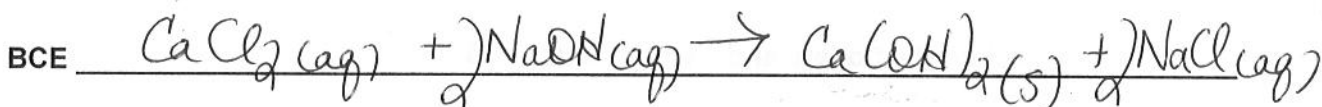
Describe the  $\text{Ca}(\overset{\text{Cl}}{\text{OH}})_2(aq)$  solution Cl & C

Describe the  $\text{NaOH}(aq)$  solution Cl & C

Add 4 drops of calcium chloride to 4 drops of sodium hydroxide.

What evidence of chemical change occurred? ppt = precipitate =

formation of a solid



5) **Burning Magnesium--tomorrow's lab!** physical or chemical?