Types of Reactions

Classification of reactions:

A. Synthesis or combination reactions

$$6Fe_{(s)} + 3O_{2(g)} \rightarrow 3Fe_2O_{3(}s)$$

B. Decomposition

$$2H_2O_2 \rightarrow O_{2(g)} + 2H_2O \text{ (in a presence of catalyst)}$$

C. Single replacement

$$Sn + 2HCl \rightarrow SnCl_{2(aq)} + H_{2(gas)}$$

D. Double replacement

$$Pb(NO_3)_{2(aq)} + 2\ KI_{(aq)} \rightarrow PbI_{2(s)} + 2KN0_{3(aq)}$$

E. Neutralization

$$HCl_{(aq)} + NaOH_{(aq)} \rightarrow NaCl_{(aq)} + H_2O$$

Evidence of Reaction:

A. Formation of solid - precipitation

Solid formed when two aqueous solutions are mixed. Precipitates appear as initially as cloudiness.

B. Gas formation. Fizzing or effervescence

Test for flammability of a gas with a burning splint.

C. Change in color.

Differentiate between dilution and actual reaction.

D. Heat generation or heat loss.

Experiment:

Write down your observation on the data sheet.

- Note if the product formed is solid (ppt), gas, change in color and if heat is evolved or lost.
- Note the characteristic of your reactants such as its color.

- If it is a metal, note it's characteristic before you add it to a solution. Is it shiny, hard or soft?
- When adding two reactants that are solutions together always mix with a stirring rod. Remember to rinse the stirring rod before using it into another reaction.
- Remember that gas dissipates. Immediately after adding reactants, mix with a stirrer and observe for bubbling and/or odor. Remember to waft toward you.

EXPERIMENT

Part A Combination reaction

#1. This was done as a demo in lecture.

Part B Decomposition

#1. Hold the test tube with a test tube holder. Heat from the side of the test tube. The correct color change is not brown. Use a cool blue flame.

#2b. Gas must be evolving when the burning splint is placed in the flask. Do not wait tooooo long before placing the burning splint into the heated flask.

Waste: Dissolve the sodium hydrogen carbonate in water and dump down the drain.

Part C Single-Replacement.

#1. Silver nitrate can stain skin black.

Waste:All waste from Part C go into a waste jar.

Part D Double-Replacement

Waste: All waste from Part D go into a waste jar.

Part E Neutralization

Safety: Acids and sodium hydroxide are corrosives. Wash skin immediately if acid/base is spilled on it.

Data:

Based on your observations and also the written equations, you should be able to determine which of your products are solid, gas or aqueous.

You should be able to balance your equations by inspection.