Physical and Chemical changes

Introduction: Some of the most useful properties of matter are those related to **how** & **why** matter changes the way it does. During a **"physical" change** the substance involves remains the same substance even though it may have changed state (melting, boiling, freezing, condensation, sublimation) or dissolved in a solvent. During a **"chemical" change** the original substance is changed into different substances that have different properties. Sometimes the change is very obvious (a gas is formed from 2 solids) while other times the change is very subtle (a small increase in temperature).

In this activity you will perform a series of brief experiments. As you do each experiment look carefully for clues that indicate whether the change is physical or chemical.

Exp 1: **Half fill** a test tube with **limewater** (calcium hydroxide) then using a medicine dropper add approx **10 drops** of **cobalt chloride** solution. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack .

Exp 2: **Half fill** a test tube with **limewater** (calcium hydroxide) then using a medicine dropper add approx **10 drops** of **phenolphthalein** (pptl) solution. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp 3: Sprinkle a little **table salt** (sodium chloride) on a **tarnished penny** in a watch glass then add enough **vinegar** (acetic acid) to cover the coin. *Observe carefully & fill in the chart on the back of this lab sheet. ** wash penny off and leave at station

Exp 4: Place 3 - 5 chunks of **limestone** (calcium carbonate) in a mortar & pestle and **grind** into a powder. *Observe carefully & fill in the chart on the back of this lab sheet. ** keep the powder for exp 5 !

Exp 5 Half fill a test tube with **hydrochloric** acid then add the powdered **calcium carbonate** fron exp 4. . *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp6: Place about 3 cm of **sodium hydroxide** solution in a test tube then add a small amount of solid **ammonium chloride**. Shake the tube against your hand then holding the bottom of the tube carefully waft the mouth of the tt. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp7: Place about 3 cm of **sodium hydroxide** solution in a test tube then add 3 cm of **hydrochloric acid** solution. ***Careful these compounds are caustic and will burn skin*** *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp8: Place about 3 cm of **potassium iodide** solution in a test tube then add 3 cm of **lead nitrate** solution. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp 9: Place about 4 cm of **copper sulfate** solution in a test tube then add a chunk of **steel wool** such that 75% of the wool is submerged & 25% is above the solution. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp 10: Place a small amt of solid **barium hydroxide** in a testtube then add an equal amt of solid **ammonium thiocyanide**. Cover the testtube mouth with your thumb & shake vigorously. Carefully waft the mouth of the tt. *Observe carefully & fill in the chart on the back of this lab sheet.

Exp 11: Obtain a small amount of **sulfur** from the teacher in a deflag spoon. Hold it such that it hangs vertically in the flame in the fume hood *Observe carefully & fill in the chart on the back of this lab sheet. Burn off the sulfur and leave the spoon in the hood.

Exp 12: Place a small amt of solid **ammonium chloride** in a testtube then add 2 cm of water. Shake the tube against your hand then holding the bottom of the tube carefully waft the mouth of the tt. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the testtube & return it to the rack!

Exp 13: Half fill a test tube with **hydrogen peroxide** then add a small amount of powdered **manganese dioxide** *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!

Exp 14: Add about 5 ml of HCl into a test tube. Place a strip of folded magnesium into the acid and stopper the tube. Light a splint. Remove the stopper and insert flaming splint into mouth of tube. *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the testtube & return it to the rack!

Exp 15: Half fill a test tube with **hydrochloric acid** then add an equal amount of **sodium thiosulfate** *Observe carefully & fill in the chart on the back of this lab sheet. ** clean the tt & return it to the rack!.

Observations Chart:

Experiment #	reactants	observations
1		
2		
3		
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5		
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