

Name _____ Date: _____

Chemistry 11 Chemical Reactions Lab: Classification of Reactions

Objectives:

- 1) To classify reactions as synthesis, decomposition, combustion, single replacement, double replacement or neutralization.
- 2) To predict the products of these reactions.
- 3) To write word and formula equations for these reactions.
- 4) To balance these equations.

Procedure:

- 1) Record the properties of each reactant. (at minimum: colour, state)
- 2) Perform the experiment described in each section.
- 3) Record the evidence of chemical change. Be detailed and clear.
- 4) Classify the reaction. Each type is used only once.
- 5) Complete the word equation, then write formulas and balance the equation.
- 6) **PUT ALL CHEMICAL WASTE IN THE WASTE BEAKER AT EACH STATION, AND WASH YOUR HANDS WHEN YOU ARE FINISHED!**

Observations and Discussion:

Reaction 1: Copper with ?

1. Observe and describe the copper wire.
2. Using tongs, heat the wire in the Bunsen burner flame for two minutes. DO NOT burn anything else.
3. Allow the wire to cool, or cool it in water. Leave it in the beaker of water.
4. What other reactant (from the air) took part in the reaction? Describe it.
5. Examine the wire and record the evidence of chemical change.

Description of COPPER	Description of _____ (other reactant)	Evidence of chemical change

/2

Type of Reaction: _____

/1

Word Equation

copper + _____ → _____

/1

Balanced Chemical Equation:

/2

Reaction 2: Hydrochloric Acid + Sodium Hydroxide

1. Describe the sodium hydroxide and hydrochloric acid solutions.
2. Fill the test tube about one-fifths full of sodium hydroxide solution. Add 2 drops of phenolphthalein.
3. Add hydrochloric acid one drop at a time using a pipette until you observe a colour change.
4. Record 'evidence of chemical change', then dispose of in the designated waste bin.

Description of SODIUM HYDROXIDE	Description of HYDROCHLORIC ACID	Evidence of chemical change	/2

Type of Reaction: _____ /1

Word Equation

hydrochloric acid + **sodium hydroxide** → _____ + _____ /1

Balanced equation: _____ /2

Reaction 3: Mossy zinc and Hydrochloric Acid

1. Fill a test tube one quarter full with Hydrochloric acid.
2. Select a piece(s) of mossy zinc that will fit into the test tube..
3. Describe the zinc, and the acid solution.
4. Add the zinc to the acid solution. Let the reaction occur as you move on to the next station.
5. After a time, record 'evidence of chemical change', then dispose of in the waste bin.

Description of ZINC	Description of HYDROCHLORIC ACID	Evidence of chemical change	/2

Type of Reaction: _____ /1

Word Equation

zinc + **hydrochloric acid** → _____ + _____ /1

Balanced equation: _____ /2

Reaction 4: Sodium Carbonate + Calcium Nitrate

1. Put a pipette full of Sodium Carbonate solution into a test tube. Describe the solution.
2. Put a pipette full of Calcium Nitrate solution into a test tube. Describe the solution.
3. Combine the solutions. Record 'evidence of chemical change', then dispose of in the designated waste bin.

Description of SODIUM CARBONATE	Description of CALCIUM NITRATE	Evidence of chemical change	/2

Type of Reaction: _____ /1

Word Equation

sodium + **calcium** → _____ + _____ /1
carbonate **nitrate**

Balanced equation: _____ /2

Reaction 5: Isopropanol (C₃H₇OH)

1. Pour a splash of isopropanol (only a few mL) in the bottom of a 250 mL beaker. DO NOT TOUCH THE BEAKER, IT MAY BE HOT FROM A PREVIOUS GROUP.
2. Describe the isopropanol.
3. Put the beaker of isopropanol on the screen, then light a wood splint and drop it in.
4. What other reactant from the air took part in the reaction? (Describe it)
5. Do not touch the hot beaker! Leave it on the screen and move on.

Description of ISOPROPANOL	Description of _____ (other reactant)	Evidence of chemical change	/2

Type of Reaction: _____ /1

Word Equation

isopropanol + _____ → _____ + _____ /1

Balanced Equation: _____ /2

Reaction 6: Hydrogen Peroxide (H₂O₂)

1. Fill a test tube one quarter full of hydrogen peroxide. Describe it.
2. Add 1 VERY small scoop of the catalyst manganese dioxide to the test tube.
3. Test the gas with a glowing splint. Light the splint, blow it out, and put it in the end of the test tube (do not let the splint touch the solution!). **If it makes a screeching noise, hydrogen gas is present. If the splint re-lights, oxygen gas is present.*
4. Record 'evidence of chemical change' and dispose of in the designated waste bin.

Description of HYDROGEN PEROXIDE	Description of MANGANESE DIOXIDE (MnO₂)	Evidence of chemical change

/2

Type of Reaction: _____ /1

Word Equation: **One of the products is provided. You only need to identify the other. The manganese dioxide (MnO₂) is a catalyst and is written above the reaction arrow*

hydrogen peroxide -----> water + _____ /1

Balanced Equation: /2

Conclusion: /2
