LESSON 90

LAB

# Solid Evidence
# Precipitation Reactions

Name _____

Date _____ Period _____

## Purpose

To explore chemical reactions that form precipitates.

## Materials

- well plate
- set of 7 small labeled dropper bottles with 1.0 M solutions of $KNO_3$, $Mg(NO_3)_2$, $Cu(NO_3)_2$, $AgNO_3$, NaCl, $Na_2CO_3$, and NaOH

## Procedure

1. You are using seven different ionic solutions today. List the anions and cations present in those solutions along with their appropriate charges.

   anions:

   cations:

2. Examine the equations in the table. Write in the second product in each reaction. (*Note:* You will not know whether the second product is an aqueous solution or a solid precipitate until you carry out the reaction.) Balance each chemical equation.

| Chemical reactions with ionic substances | Solid? |
|---|---|
| $NaCl(aq) + KNO_3(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaCl(aq) + Mg(NO_3)_2(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaCl(aq) + Cu(NO_3)_2(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaCl(aq) + AgNO_3(aq) \longrightarrow NaNO_3(aq) +$ | |
| $Na_2CO_3(aq) + KNO_3(aq) \longrightarrow NaNO_3(aq) +$ | |
| $Na_2CO_3(aq) + Mg(NO_3)_2(aq) \longrightarrow NaNO_3(aq) +$ | |
| $Na_2CO_3(aq) + Cu(NO_3)_2(aq) \longrightarrow NaNO_3(aq) +$ | |
| $Na_2CO_3(aq) + AgNO_3(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaOH(aq) + KNO_3(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaOH(aq) + Mg(NO_3)_2(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaOH(aq) + Cu(NO_3)_2(aq) \longrightarrow NaNO_3(aq) +$ | |
| $NaOH(aq) + AgNO_3(aq) \longrightarrow NaNO_3(aq) +$ | |

3. Carry out each reaction in the well plate. Add 10 drops of the first reactant. Then add 10 drops of the second reactant. Place a check in the second column of the table if you observe the formation of a solid.

4. Complete the chemical equations by adding (*s*) for solid or (*aq*) for aqueous.
5. When you have finished the lab, empty your well plate into the waste container, and then rinse it.

## Analysis

1. Which of the products in the table are soluble in water? How do you know?

2. Which products are insoluble in water? How do you know?

3. Predict the products of this reaction. Balance the chemical equation.

   $MgCl_2(aq) + \quad KOH(aq) \longrightarrow$

4. Which product in Question 3 do you think will be a solid? What is your reasoning?

5. **Making Sense** What generalizations can you make about the results of mixing aqueous salt solutions?

6. **If You Finish Early** Predict what solutions you could mix together to form these precipitates. What did you base your predictions on?
   a. $Ca(OH)_2$
   b. $ZnCO_3$