**Names:** _____ **15 Pts.**

# Chemistry Mini-Lab: The 4 Bottles Experiment

## I. Purpose:

To observe a chemical reaction and predict the identity of the products formed in a reaction.
Distinguish between soluble and an insoluble precipitate.

## II. Procedure:

1. At the front bench are four lettered bottles that each contain a dissolved salt. These four salts are cobalt(II) chloride, sodium hydroxide, iron(II) chloride, and ammonium carbonate.
2. Obtain four clean small beakers and label them A, B, C, and D
3. Pour about 15 ml of each solution into the appropriate beakers. You can get more solution if you run out, these tests are entirely qualitative; (i.e., a little drop does the same as a large amount. Conserve the amount you use)
4. With a test tube rack and clean test tubes design an experiment that determines the identity of the salt in each bottle.

## III. Analysis:

**Data:** Use this table to summarizes your *observations.*

| | Bottle A | Bottle B | Bottle C | Bottle D |
|---|---|---|---|---|
| Bottle A | | | | |
| Bottle B | | | | |
| Bottle C | | | | |
| Bottle D | | | | |

## IV. Conclusion Questions:

1. What is the identity of bottles 1 through 4?

Bottle A: _____ Bottle C: _____

Bottle B: _____ Bottle D: _____

2. For each combination that produced a precipitate write a balanced equation that *includes phase notation*.

Each member of your group must complete one of the following equations:
Write a balanced equation that includes phase notation for the following reactions:

a.) Lab Partner: _____

$AgNO_{3(aq)} + Na_2SO_{4(aq)} \longrightarrow$

b.) Lab Partner: _____

$Na_2S_{(aq)} + CoCl_{3(aq)} \longrightarrow$

c.) Lab Partner: _____

$H_3PO_{4(aq)} + Ce(NO_3)_{2(aq)}$