

Prelab ("Lab Ticket"): Write a balanced chemical equation for each of the 16 reactions.

- Procedure:**
1. Wear goggles!
 2. Obtain a spotplate from the tray on the counter. It should be relatively dry.
 3. Move from station to station with your spot plate. At each station, add 1-2 drops of each solution to the same well on the spot plate and observe. (Your observations should be brief, for example, "red ppt" or "white ppt" or "blue-violet ppt" or "N.R.")
 4. Halfway through the lab, and at the end of the lab, clean your spot plate by taking it to the THINK TANK. Use a spray bottle to rinse your spot plate into the think tank.
 5. Wash hands after the lab.

Reactions:

1. Sodium nitrate + potassium chloride Observation: _____

2. Cobalt nitrate + sodium carbonate Observation: _____

3. Lithium carbonate + barium chloride Observation: _____

4. nickel sulfate + sodium phosphate Observation: _____

5. aluminum nitrate + sodium carbonate Observation: _____

6. Silver nitrate + potassium chromate Observation: _____

7. Lithium nitrate + ammonium chloride Observation: _____

8. Cobalt nitrate + potassium hydroxide Observation: _____

9. Barium nitrate + potassium chromate Observation: _____

10. Silver nitrate + sodium chloride Observation: _____

11. Sodium sulfate + calcium chloride Observation: _____

12. Lead (II) nitrate + potassium iodide Observation: _____

13. cobalt nitrate + sodium phosphate Observation: _____

14. ammonium sulfate + barium chloride Observation: _____

15. silver nitrate + barium hydroxide Observation: _____

16. cupric nitrate + sodium hydroxide Observation: _____

Writeup:

1. a. What "phase" were the reactants in all 16 reactions you did? *s* *l* *g* *aq*

b. That means that the reactant compounds must have been *soluble* *insoluble* in water

2. On page 4 of this lab, make two columns titled "Soluble Compounds" and "Insoluble Compounds."

a. Based on your answers to 1a and 1b, write every reactant compound (from reactions 1-16) in/on the appropriate list.

b. If you observed that a rxn was "N.R.", then that means that the products of the particular reaction are both *soluble* *insoluble*

c. Write the products of the three "N.R." reactions in/on the appropriate list.

d. For the reactions that did make a precipitate, this means that at least one of the products would be *soluble* *insoluble*

e. Use process of elimination to determine which compound was the precipitate (was not soluble) in the reactions that formed precipitates. Write each insoluble compound onto the "insoluble" list.

3. Solubility Rules:

a. Based on your data (lists), compounds containing nitrate ion (NO_3^{-1}) are always *soluble* *insoluble*

b. Based on your data, compounds containing alkali (IA) ions (Li^{+1} , Na^{+1} , K^{+1} ...) are always *soluble* *insoluble*

c. Analyze your lists on page 4 in order to write two solubility rules of your own.

(NOT ABOUT NITRATE OR ALKALI IONS!)

For each rule, find one with at least 3 supporting examples from the same column.

If there are exceptions to your rule, state those too!

(for example, "acetate ion is always soluble unless it is in a compound with Ag^{+1} ,"

or "compounds containing oxalate ion are always insoluble unless the cation is ammonium or an alkali ion")

Rule #1: _____

Explain your logic for your rule #1 (and exception(s), if any). List all the example compounds and explain.

Rule #2: _____

Explain your logic for your rule #2 (and exception(s), if any). List all the example compounds, and explain.

4a. Label any precipitates in reactions 1-16 with the correct phase subscript.

4b. For the three "N.R." rxns, cross out the product compounds (put a single line through them) and write N.R. (DON'T cross out the reactants! Just cross out the products!)

4c. Make sure you **balanced** all of your reactions!