

Double-Replacement Precipitation Lab

Introduction: Double-Replacement reactions occur when two ionic solutions mix to form an insoluble solid. If all cations and anions are soluble then no reaction will occur. During the lab procedure, several ionic solutions will be mixed to determine if a precipitate reaction will occur. Those reactions that do not form a precipitate will be marked for No Reaction (NR). Students will practice writing and balancing double-replacement reactions.

Pre-Lab questions:

1. How would you describe a double replacement reaction to a friend who is struggling with reaction types?
2. What is a precipitate?

Materials:

- 0.2M sodium bromide, NaBr
- 0.2M sodium carbonate, Na_2CO_3
- 0.2M sodium phosphate, Na_3PO_4
- 0.2M sodium sulfate, Na_2SO_4
- 0.2M sodium hydroxide, NaOH
- Transparency paper
- 0.2M lithium chloride, LiCl
- 0.2M copper(II) chloride, CuCl_2
- 0.2M zinc chloride, ZnCl_2
- 0.2M strontium chloride, SrCl_2
- 0.2M barium chloride BaCl_2
- Background paper Template

Safety: You MUST wear goggles during this lab activity

Procedure:

1. Place the overhead sheet over the background paper.
2. Using the Data Table as a guide, mix every possible pair of solutions in a separate square of the background paper. **Use 1 or 2 drops of each solution.** Do NOT contaminate the individual pipets with different solutions.
3. Mix the solutions with a rinsed toothpick if you are uncertain if a precipitate formed. Rinse the toothpick after EACH mixing – be careful of which end of the rod you use so that you do not touch the chemicals or contaminate your samples!
4. Observe each mixture carefully for signs of a precipitate. (Some precipitates are light in color and hard to see so you may want to slide the transparency over the black lab top on occasion.) Record your observations (presence or absence of a precipitate, and other characteristics such as color, texture, etc.) in the Data Table. If nothing happens, write NR for no reaction.
5. Rinse and wipe the transparency sheet into the sink. Dry the sheet.

Observations: Write the observations you made from combining these materials in the spaces in the table below. Note any color changes or precipitate (cloudiness/solid). If no change is observed write NR for no reaction.

| | NaBr | Na_2CO_3 | Na_3PO_4 | Na_2SO_4 | NaOH |
|-----------------|------|--------------------------|--------------------------|--------------------------|------|
| LiCl | | | | | |
| CuCl_2 | | | | | |
| ZnCl_2 | | | | | |
| SrCl_2 | | | | | |
| BaCl_2 | | | | | |

Lab 17 Double Replacement Reactions Answers

Dennis D. Staley, Edward L. Waterman



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sea in the east and south and by the skagerrak and kattegat straits in the southwest

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