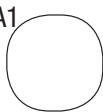
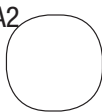
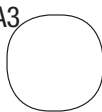
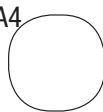

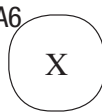
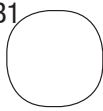
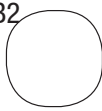
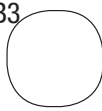
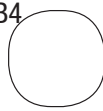
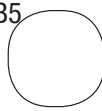
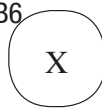
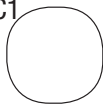
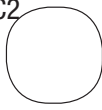
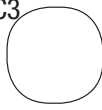
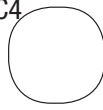
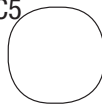
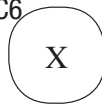
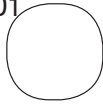
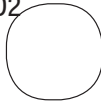
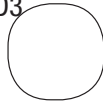
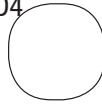
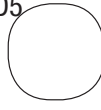
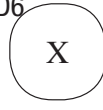


# Solubility Patterns Worksheet

|                 | $\text{IO}_3^-$                                                                      | $\text{SO}_4^{2-}$                                                                   | $\text{C}_2\text{O}_4^{2-}$                                                          | $\text{CO}_3^{2-}$                                                                    | control                                                                                |                                                                                        |
|-----------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| $\text{MgCl}_2$ | A1  | A2  | A3  | A4  | A5  | A6  |
| $\text{CaCl}_2$ | B1  | B2  | B3  | B4  | B5  | B6  |
| $\text{SrCl}_2$ | C1  | C2  | C3  | C4  | C5  | C6  |
| $\text{BaCl}_2$ | D1  | D2  | D3  | D4  | D5  | D6  |

**Figure 1.** Demonstration Setup

- Observe the reactions that develop in the reaction plate and record the results in the table of circles. Use the abbreviations PPT and NR to note the formation of a precipitate or no reaction, respectively.
- What patterns or trends are obvious in the solubility behavior of the alkaline earth metal compounds?
  - Which alkaline earth metal ion formed the most precipitates?
  - The fewest?
  - Which testing solution gave the most precipitates?
  - The fewest?
- Identify any periodic trend in the solubility behavior of alkaline earth metal compounds. Is there any relationship between the solubility of alkaline earth metal compounds and the position of the metal in the periodic table?
- Propose an explanation for the observed solubility pattern.
- Use the observed solubility pattern to predict a chemical method for the separation of a mixture of calcium and barium ions in solution. (Imagine a solution that is 0.1 M in both  $\text{CaCl}_2$  and  $\text{BaCl}_2$ . What reagents can be added to this mixture and in what order to separate the two compounds?)

# Net Ionic Equation Worksheet

Write out the net ionic equation for each reaction. If no reaction occurs, write NR.

1.  $\text{MgCl}_2$  and  $\text{KIO}_3$
2.  $\text{MgCl}_2$  and  $\text{Na}_2\text{SO}_4$
3.  $\text{MgCl}_2$  and  $(\text{NH}_4)_2\text{C}_2\text{O}_4$
4.  $\text{MgCl}_2$  and  $\text{Na}_2\text{CO}_3$
5.  $\text{CaCl}_2$  and  $\text{KIO}_3$
6.  $\text{CaCl}_2$  and  $\text{Na}_2\text{SO}_4$
7.  $\text{CaCl}_2$  and  $(\text{NH}_4)_2\text{C}_2\text{O}_4$
8.  $\text{CaCl}_2$  and  $\text{Na}_2\text{CO}_3$
9.  $\text{SrCl}_2$  and  $\text{KIO}_3$
10.  $\text{SrCl}_2$  and  $\text{Na}_2\text{SO}_4$
11.  $\text{SrCl}_2$  and  $(\text{NH}_4)_2\text{C}_2\text{O}_4$
12.  $\text{SrCl}_2$  and  $\text{Na}_2\text{CO}_3$
13.  $\text{BaCl}_2$  and  $\text{KIO}_3$
14.  $\text{BaCl}_2$  and  $\text{Na}_2\text{SO}_4$
15.  $\text{BaCl}_2$  and  $(\text{NH}_4)_2\text{C}_2\text{O}_4$
16.  $\text{BaCl}_2$  and  $\text{Na}_2\text{CO}_3$