

**SOLUTION CHEMISTRY - PRECIPITATE FORMATION THROUGH
DOUBLE REPLACEMENT REACTIONS**

Purpose: to study the formation of precipitates and to practice writing molecular, ionic and net ionic equations.

Apparatus: twelve test tubes and a test tube rack

Materials: 0.1 M solutions as listed in the observation table

Procedure:

1. Carry out the reactions listed in the table below by first placing 3 mL (about 2 cm) of each solution in a separate test tube and then mix. DO NOT AT ANY TIME POUR SOLUTIONS BACK INTO THE STOCK BOTTLES
2. Record observation of the precipitate in the observation table. Include colour and the nature of the precipitate (i.e. milky, clumpy, silky, chunky)
3. Dispose of all solutions in the waste beaker provided.

Observations:

	Reactants	Observations
1.	barium nitrate + sulphuric acid ($\text{Ba}(\text{NO}_3)_2 + \text{H}_2\text{SO}_4$)	
2.	barium chloride + sodium phosphate ($\text{BaCl}_2 + \text{Na}_3\text{PO}_4$)	
3.	calcium nitrate + sodium phosphate ($\text{Ca}(\text{NO}_3)_2 + \text{Na}_3\text{PO}_4$)	
4.	calcium chloride + sodium carbonate ($\text{CaCl}_2 + \text{Na}_2\text{CO}_3$)	
5.	lead(II) nitrate + potassium iodide ($\text{Pb}(\text{NO}_3)_2 + \text{KI}$)	
6.	strontium nitrate + sodium carbonate ($\text{Sr}(\text{NO}_3)_2 + \text{Na}_2\text{CO}_3$)	
7.	copper(II) nitrate + sodium hydroxide ($\text{Cu}(\text{NO}_3)_2 + \text{NaOH}$)	
8.	iron(III) nitrate + potassium hydroxide ($\text{Fe}(\text{NO}_3)_3 + \text{KOH}$)	
9.	aluminum nitrate + ammonium hydroxide ($\text{Al}(\text{NO}_3)_3 + \text{NH}_4\text{OH}$)	
10.	lead(II) nitrate + sodium sulphide ($\text{Pb}(\text{NO}_3)_2 + \text{Na}_2\text{S}$)	

Conclusions:

For each reaction, write MOLECULAR, IONIC and NET IONIC equations. Use the solubility rules on the back of this sheet to determine which of the two possible products in each reaction is the precipitate. Clearly identify the precipitate in each reaction and all other states.