

2.1: Precipitation

The chemical reactions in these exercises are performed in a test tube. Test tubes come in different sizes. These experiments are designed for test tubes of 9 mL capacity. The reactant is in a test tube and the reagent (2nd reactant) is added drop by drop from a reagent bottle using a dropper, while the reaction mixture is being stirred. Use a clean glass rod to stir the reaction mixture. Stirring is necessary as the reactants must mix before they can react. Figure 2.1.1 illustrates the test tubes and reagent bottles commonly used.

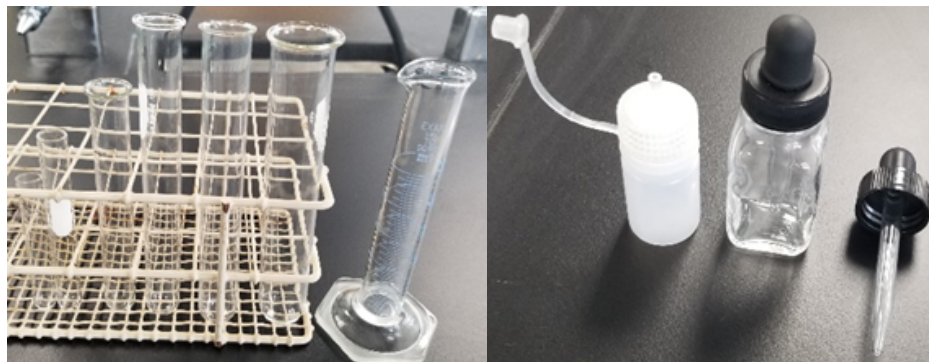


Figure 2.1.1: Test tubes of different sizes and a 25 mL capacity graduated cylinder (left) and reagent bottles with a dropper fitted in the cap (right).

- Dissolved compounds make a clear solution, i.e., the solution may be colored but it is transparent (not opaque) -it remains see-through.
- In a precipitation reaction, the solid product separates out from the clear solution making the solution opaque or turbid called a **suspension**.
- The solid product i.e., **precipitate**, may be filtered out, but usually, it is forced to settle at the bottom of the test tube as **sediment** or a **solid pellet**, by centrifugation process leaving a clear solution, i.e., **supernatant**, at the top.

Figure 2.1.2 illustrated a precipitation reaction and the difference between solution, suspension, supernatant, and precipitate.

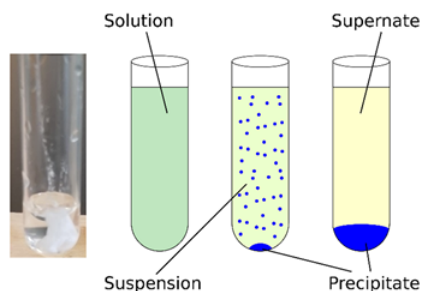


Figure 2.1.2: Formation of a milky-white AgCl precipitate upon addition of HCl to AgNO₃ solution and illustration of a solution, suspension, and precipitation. (Attributes for the illustration: [ZabMilenko](#): [original](#)[ZooFari](#): [vectorMrmw](#): [optimized](#), [multilang](#), [CC0](#), via [Wikimedia Commons](#))

Precipitation reaction must be tested for completeness, as, otherwise, the residual reactant will interfere with the other tests to be performed using the supernatant. One more drop of reagent is added to the clear supernatant and if no more precipitate forms the precipitation is complete. Otherwise, repeat the centrifugation and check again.

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