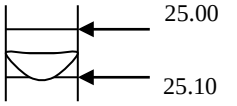
STANDARDIZATION PROCESS

Procedure:

1. Wash a 125-mL Erlenmeyer flasks then rinse with several small portions of deionized water. The flasks do not need to be completely dry.
2. Check out a burette at the stockroom. Be careful with them; they are fragile and rather expensive to replace if you break one. Rinse your burette with several portions of deionized water from your wash bottle or beaker. CAUTION: do not stick the end of the burette under the faucet! It leaks all over the floor. Be sure to open the valve at the bottom and let some water rinse out the stopcock. If you think the tip is clogged, ask your instructor to check it.
3. Practice reading your burette while cleaning it. The solution forms a curvature called a ***meniscus***. When you read a burette, the line of sight must be level with the bottom of the meniscus to avoid error. It helps to use an index card with a heavy black line drawn across it to find the bottom of the meniscus. Place the card behind the burette and bring the top edge of the black mark up to the flat center of the meniscus. Then, read the volume indicated by the top of the black line. Read your burette by estimating between the 0.1-mL marks. In other words, your recorded volume measurements include an uncertain digit at 0.01-mL. If the meniscus is right on a mark, record the second decimal place as a zero.



Record as 25.10 or 25.11 (bottom of curvature)

4. When your burette is clean, it is still wet. Rinse it 2 times with small portions of base, discarding the rinses. Then position the burette in its holder on a ring stand. Close the valve at the bottom, place a plastic funnel in the top opening and carefully pour base solution into the burette until the solution level is near the 0.00 mL mark). Make sure there are no air bubbles trapped in the tip of the burette. Record the initial base volume reading for this trial.
5. ***The next procedure is called "weighing by difference".*** Weigh the flask without then with KHP and record the mass.
6. Dissolve the KHP crystals in about 30 mL of deionized water in the 125 mL Erlenmeyer flask. If some KHP sticks to the sidewalls of the flask, wash it down with deionized water from your wash bottle. If the KHP doesn't dissolve in a short time, you may gently warm the solution in a hot tap water bath or with the heat of your hands.
7. Add 2-3 drops of phenolphthalein solution from the dropper bottle on the shelf. Please leave the indicator bottle on the reagent shelf; DO NOT take it to your work station! Swirl your acid solution to mix well.
8. Place the flask under the tip of the burette. A piece of white paper under the flask makes it easier to see the pale pink color at the endpoint. Recheck the initial volume reading. (Your burette may have leaked out a few drops of base. If your burette leaks badly, ask your instructor to check it.) Open the valve and allow base to flow from the burette into the flask. Swirl continually to mix the solutions. As you get close to the endpoint, the solution will begin to show pink color that goes away when you mix. Slow the rate of base addition to one drop at a time, mixing the solutions well after every drop. If you splash the solution up onto the sidewalls of the flask, spray a stream of water from your wash bottle over the inside of the flask. The extra water that mixes into your acid sample will not affect your results. When the addition of **one** drop of base changes the solution from colorless to pale pink, close the burette valve, rinse down the flask one last time, and make sure that the pink color lasts for at least 30 seconds. If so, record the final burette volume reading.

Discard the titrated solution into the sink, rinse the flask with deionized water then titrate a new sample of KHP. Do at least three successful titrations that achieve a pale pink color of the indicator. If at the end of any trial the color is bright rosy red, you have overshot the endpoint and cannot include that trial in your calculations. If you have time after completing the standardization of the base, you may continue right into