



A titrimetric analysis requires the careful addition of titrant.

# Experiment 9

## A Volumetric Analysis

- To prepare and standardize a sodium hydroxide solution
- To determine the molar concentration of a strong acid

### OBJECTIVES

The following techniques are used in the Experimental Procedure:

### TECHNIQUES



A chemical analysis that is performed primarily with the aid of volumetric glassware (e.g., pipets, burets, volumetric flasks) is called a **volumetric analysis**. For a volumetric analysis procedure, a known quantity or a carefully measured amount of one substance reacts with a to-be-determined amount of another substance with the reaction occurring in aqueous solution. The volumes of all solutions are carefully measured with volumetric glassware.

The known amount of the substance for an analysis is generally measured and available in two ways:

1. As a **primary standard**—An accurate mass (and thus, moles) of a solid substance is measured on a balance, dissolved in water, and then reacted with the substance being analyzed.
2. As a **standard solution**—A measured number of moles of substance is present in a measured volume of solution, generally expressed as the molar concentration (or molarity) of the substance. A measured volume of the standard solution then reacts with the substance being analyzed.

The reaction of the known substance with the substance to be analyzed, occurring in aqueous solution, is generally conducted by a titration procedure.

The titration procedure requires a buret to dispense a liquid, called the **titrant**, into a flask containing the **analyte** (Figure 9.1a, page 134). For the acid–base titration studied in Part B of this experiment, the titrant is a standard solution of sodium hydroxide and the analyte is an acid.

### INTRODUCTION

*Primary standard: a substance that has a known high degree of purity, a relatively large molar mass, is nonhygroscopic, and reacts in a predictable way*

*Standard solution: a solution having a very well known concentration of a solute*

# Lab Manual Answers Beran Chemistry

**Wolfgang Guggemos**

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