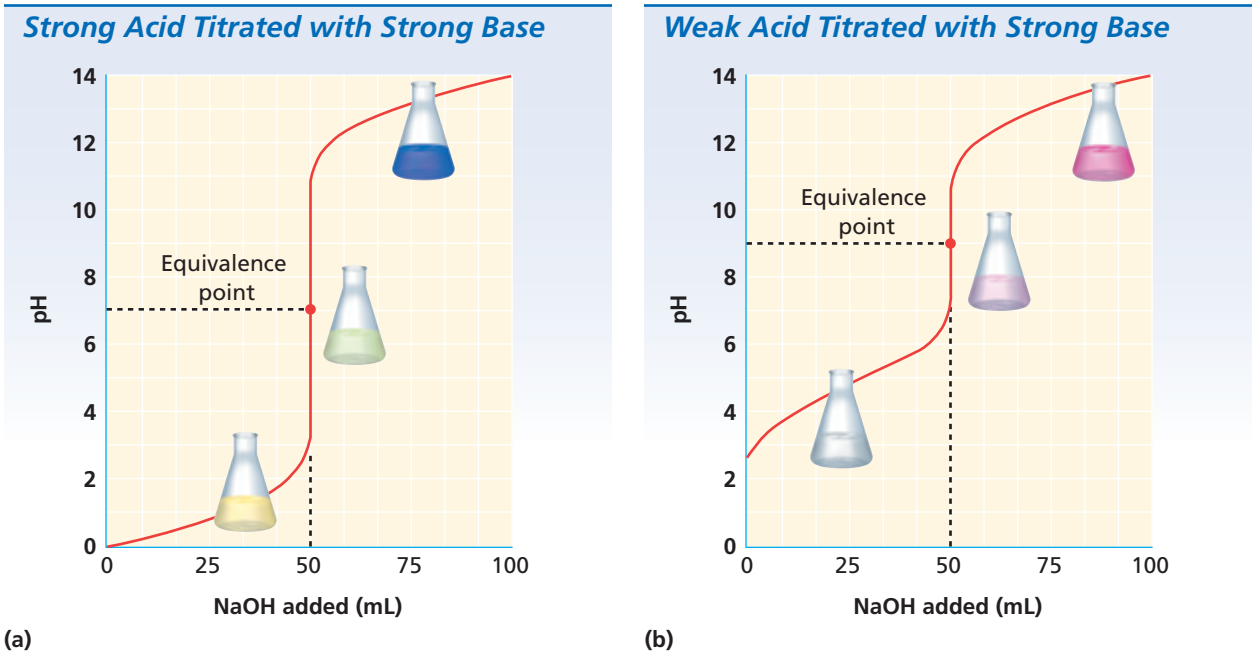

FIGURE 9 (a) When a strong acid, such as 50.0 mL of 1.00 M HCl, is titrated with a strong base, such as 1.00 M NaOH, the equivalence point occurs at pH 7.00. (b) When a weak acid, such as 50.0 mL of 1.00 M CH_3COOH, is titrated with a strong base, such as 1.00 M NaOH, the initial pH is higher and the equivalence point occurs at a pH above 7.00.

very little in determining whether reactions between such acids and bases are complete.

In a titration, successive additions of an aqueous base can be made to a measured volume of an aqueous acid. As base is added, the pH changes from a low numerical value to a high one. The change in pH occurs slowly at first, then rapidly through the equivalence point, and then slowly again as the solution becomes more basic. Typical pH curves for strong-acid/strong-base and weak-acid/strong-base titrations are shown in **Figure 9.**

Molarity and Titration

Figure 10 shows the proper method of carrying out a titration. If the concentration of one solution is known precisely, the concentration of the other solution in a titration can be calculated from the chemically equivalent volumes. *The solution that contains the precisely known concentration of a solute is known as a* **standard solution.** It is often called simply the "known" solution.

To be certain of the concentration of the known solution, that solution must first be compared with a solution of a primary standard. *A* **primary standard** *is a highly purified solid compound used to check the concentration of the known solution in a titration.* The known solution is prepared first, and its volume is adjusted to give roughly the desired concentration. The concentration is then determined more precisely by titrating the solution with a carefully measured quantity of a solution of the primary standard.