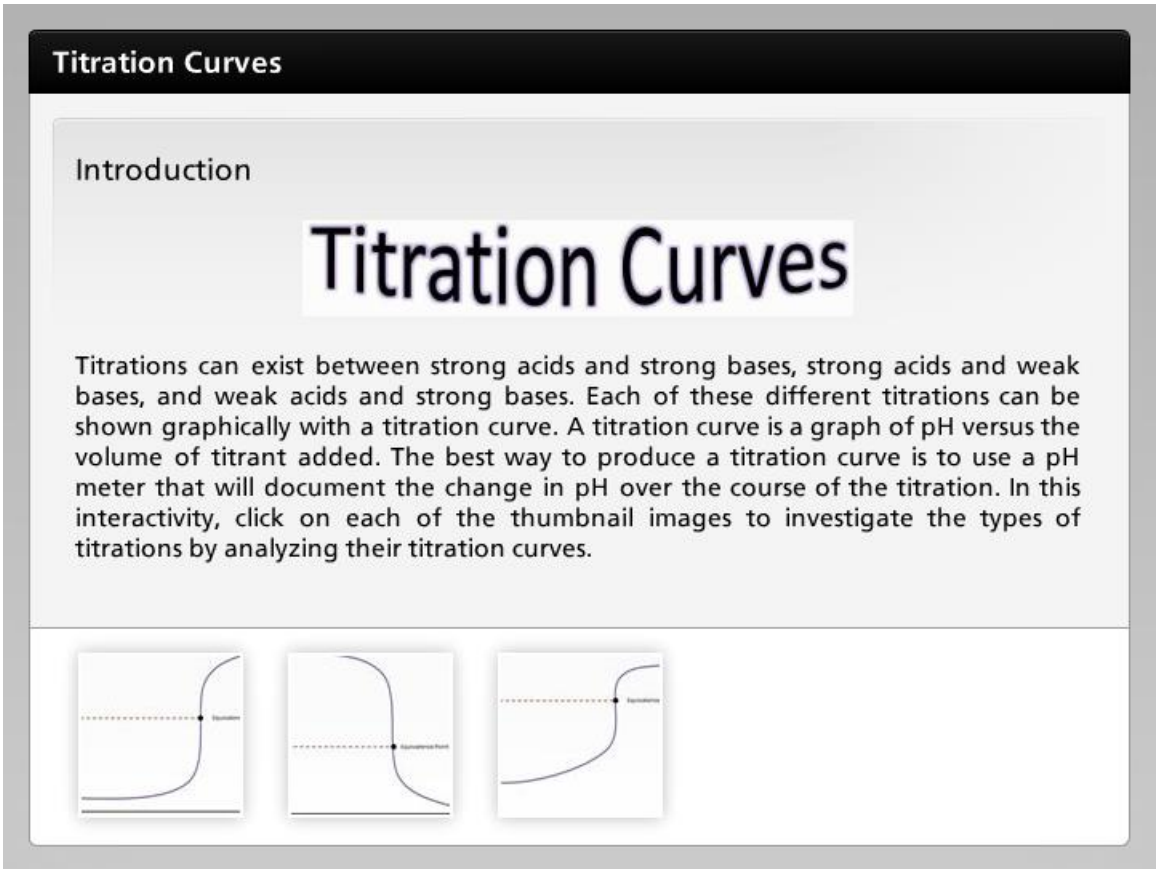
Module 11: Acid/Bases, Neutralization, and Redox Reactions
Topic 4 Content: Titration Curves Notes

Introduction



Titrations can exist between strong acids and strong bases, strong acids and weak bases, and weak acids and strong bases. Each of these different titrations can be shown graphically with a titration curve. A titration curve is a graph of pH versus the volume of titrant added. The best way to produce a titration curve is to use a pH meter that will document the change in pH over the course of the titration. In this interactivity, click on each of the thumbnail images to investigate the types of titrations by analyzing their titration curves.

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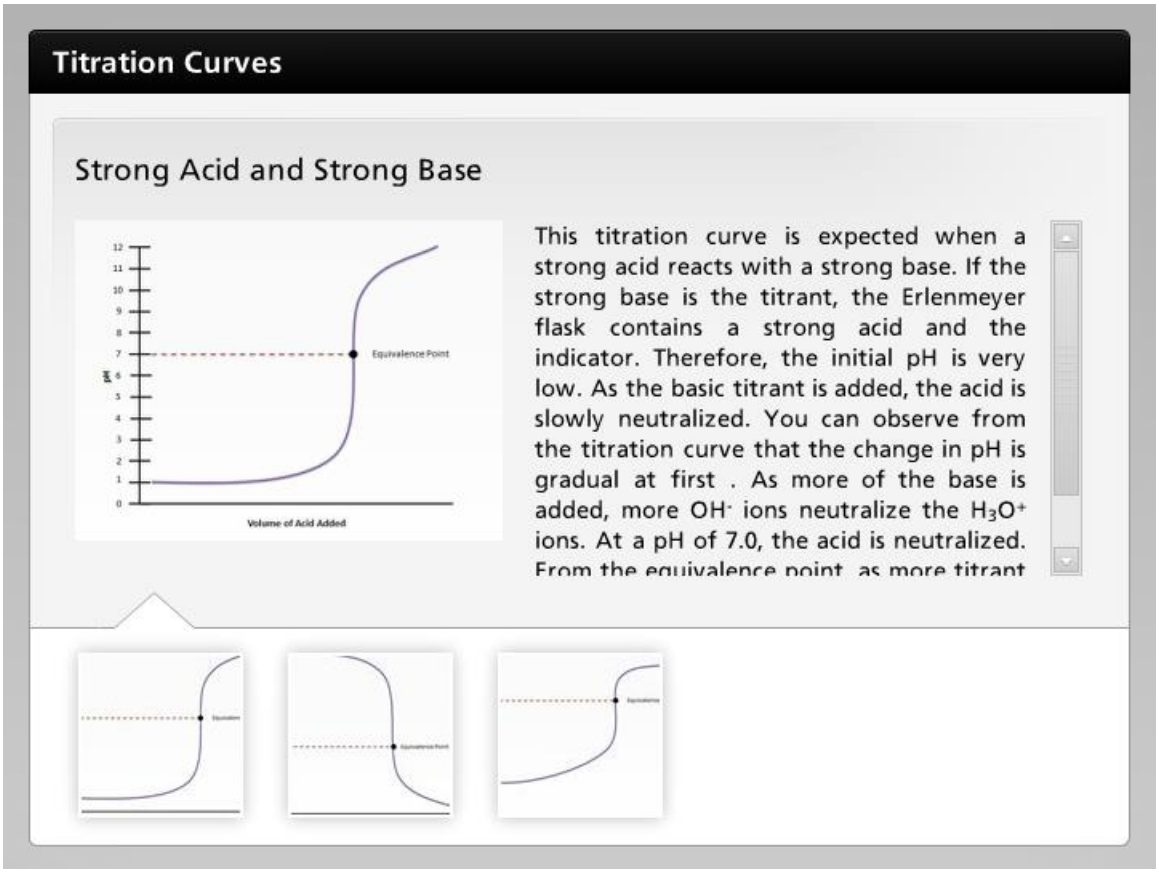
Strong Acid and Strong Base



This titration curve is expected when a strong acid reacts with a strong base. If the strong base is the titrant, the Erlenmeyer flask contains a strong acid and the indicator. Therefore, the initial pH is very low. As the basic titrant is added, the acid is slowly neutralized. You can observe from the titration curve that the change in pH is gradual at first. As more of the base is added, more OH^- ions neutralize the H_3O^+ ions. At a pH of 7.0, the acid is neutralized. From the equivalence point, as more titrant is added, the solution will continue to become more basic.

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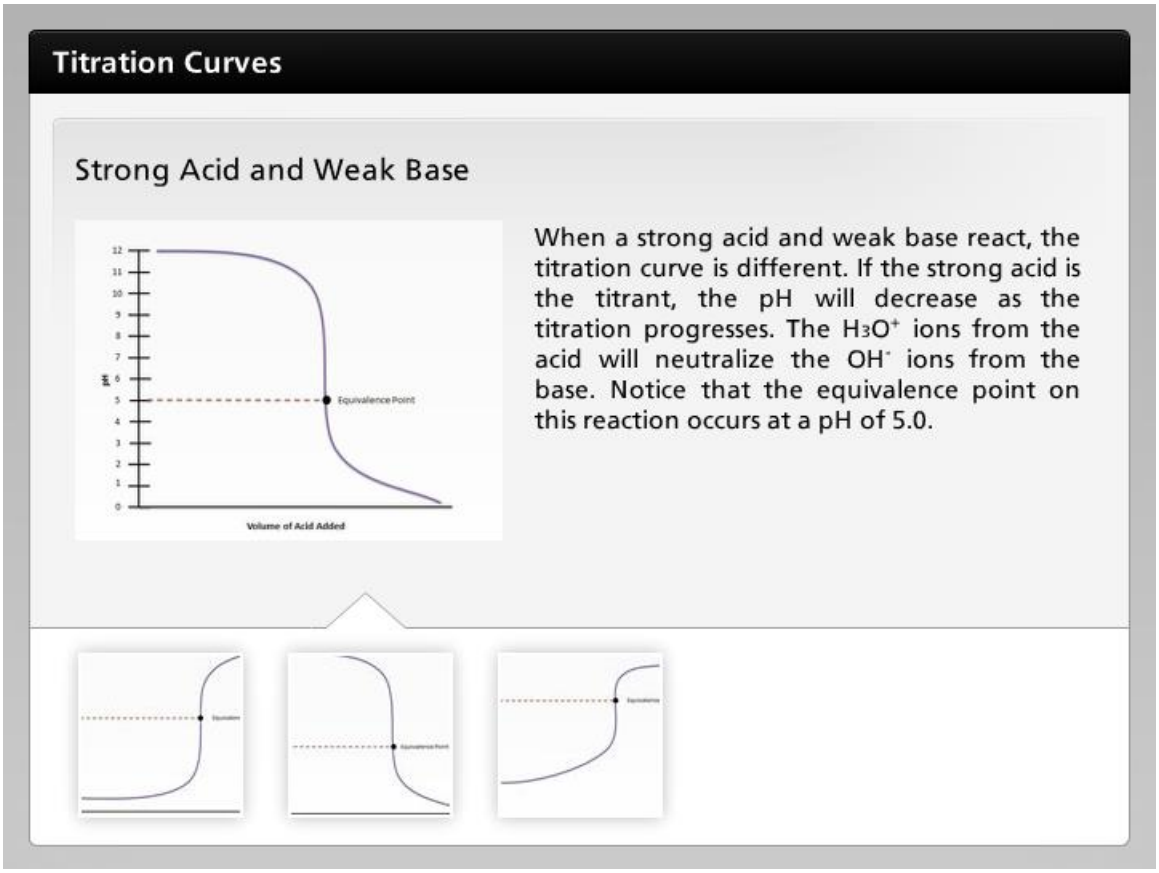
Strong Acid and Weak Base



When a strong acid and weak base react, the titration curve is different. If the strong acid is the titrant, the pH will decrease as the titration progresses. The H_3O^+ ions from the acid will neutralize the OH^- ions from the base. Notice that the equivalence point on this reaction occurs at a pH of 5.0.

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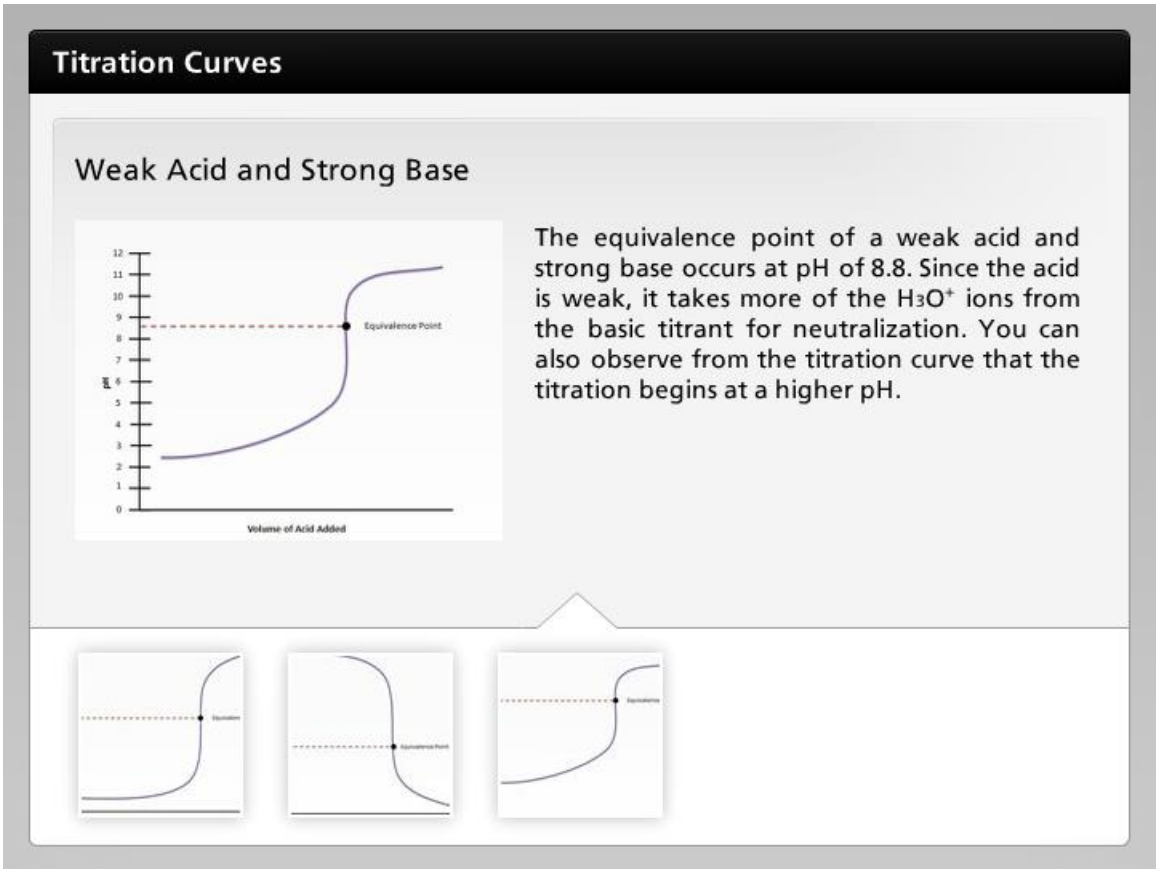
Weak Acid and Strong Base



The equivalence point of a weak acid and strong base occurs at pH of 8.8. Since the acid is weak, it takes more of the H_3O^+ ions from the basic titrant for neutralization. You can also observe from the titration curve that the titration begins at a higher pH.