

Worksheet 8

1. Make a sketch of the following scenario: a solution of 0.100 M NaOH is the titrant added from a burette. 25.0 mL of a solution of 0.100 M HCl is the analyte in a flask below the burette.
2. Write the chemical equation for the resulting reaction.
3. What is the pH of the HCl solution before any NaOH is added?
4. After 6 mL of 0.1 M NaOH is added to the flask,
  - (a) What is the limiting reactant?
  - (b) How many moles of the excess reactant remains in the flask?
  - (c) Calculate the new pH.
5. Write the definition of the equivalence point.
  - (a) Without calculation identify the volume of NaOH required to reach the equivalence point. (Note: What makes this *shortcut* possible?)
  - (b) Identify the species present in solution at the equivalence point.

- (c) Do you expect the solution to be acidic, basic, or neutral at the equivalence point? (Hint: Don't forget about *potential* acids and bases.)
6. If you were to continue adding base beyond the equivalence point what would happen to the pH?
- (a) Consider the addition of 5 mL of NaOH after the equivalence point.
- (b) Consider the addition of an infinite amount of base.
7. Sketch a graph of the corresponding pH vs Volume curve on the axes below.

