

## Titration pH Calculations

### Example One

Calculate the starting pH of the 50.0 ml of 1.0 M NaOH solution before any HCl has been added.

What are the major chemical species present at this point of the titration?

### Example Two

What is the pH if you add 25 mL of 1.0 M HCl to 50.0 mL of 1.0 M NaOH?  
What are the major chemical species present at this point of the titration?

### Example Three

What is the pH if you add 50.0 mL of 1.0 M HCl to 50.0 mL of 1.0 M NaOH?  
What are the major chemical species present at this point of the titration?

#### Example Four

What is the pH if you add 80.0 mL of 1.0 M HCl to 50.0 mL of 1.0 M NaOH?  
What are the major chemical species present at this point of the titration?