Study the pH change in the titration of $\frac{M}{10}HCl$ with $\frac{M}{10}NaOH$ using universal indicator.

Requirements

Burette, pipette (20.0 mL), titration flask, beakers, funnel, universal indicator solution, 0.1 M HCl and 0.1 M NaOH.

Procedure

1. Take a clean burette and rinse it with 0.1 M HCl solution and then fill it with this 1 solution.
2. Rinse the pipette with 0.1 M NaOH solution. Pipette out 20.0 mL of 0.1 M NaOH in the conical flask and add about 10 drops of the universal indicator solution to it.
3. Swirl the solution until the colour of the solution becomes uniform. Compare the colour of the solution with the 'pH Indicator Chart' and estimate the pH of the solution.
4. Now add 0.1 M HCl from the burette to the solution slowly. After addition of 1 mL solution compare the colour of the solution with the 'pH Indicator Chart' and estimate the pH of the solution.
5. Keep on adding 0.1 M HCl and estimate the pH of the solution after addition of each 1 mL solution. In this way add about 30 mL of 0.1 M HCl solution and record the data in the table.

Observations

Volume of 0.1 M NaOH solution taken = 20.0 mL

Volume of 0.1 M HCl solution added (mL)	Colour of the solution	Approximate pH
1.0		
2.0		
3.0		
.		
.		
.		
19.6		
19.8		
19.9		
20.0		
20.1		
20.2		
20.4		
.		
.		
.		
28.0		
29.0		
30.0		

Plot a graph of pH of the solution vs. volume of 0.1 M HCl added.

Conclusion

The pH of the solution decreases with addition of 0.1 M HCl. The decrease in pH is slow in the beginning. After addition of about 19.0 mL solution, the further addition shows a sharp fall in pH. After the sharp fall the decrease in pH again becomes slow. The point where there is sharp fall in pH (from about 10 to 3) corresponds to the equivalence point.