

# *Acid-Base Titrations*

**Spoken Tutorial Project**

**<http://spoken-tutorial.org>**

**National Mission on Education through ICT**

**<http://sakshat.ac.in>**

**Madhuri Ganapathi  
Snehalatha Kaliappan  
IIT Bombay**

**6 March 2017**



# Learning Objectives



# Learning Objectives

**We will learn to standardise:**



# Learning Objectives

**We will learn to standardise:**

- ▶ **Strong-Acid with Strong-Base**



# Learning Objectives

**We will learn to standardise:**

- ▶ **Strong-Acid with Strong-Base**
- ▶ **Strong-Acid with Weak-Base**



# Learning Objectives

**We will learn to standardise:**

- ▶ **Strong-Acid with Strong-Base**
- ▶ **Strong-Acid with Weak-Base**
- ▶ **using titration method**



# Pre-requisites



# Pre-requisites

- ▶ **ChemCollective Vlabs interface**



# Pre-requisites

- ▶ **ChemCollective Vlabs interface**
- ▶ **If not for relevant tutorials please visit our website**  
**[www.spoken-tutorial.org](http://www.spoken-tutorial.org)**



# System Requirement



# System Requirement

- ▶ Mac OS v 10.10.5



# System Requirement

- ▶ **Mac OS v 10.10.5**
- ▶ **ChemCollective Vlabs v 2.1.0**



# System Requirement

- ▶ **Mac OS v 10.10.5**
- ▶ **ChemCollective Vlabs v 2.1.0**
- ▶ **Java v 8**



# Calculations



# Calculations

- ▶  $V_i$  (Initial buret reading of NaOH) = 50 mL
- ▶  $V_f$  (Final buret reading) = 29.991 mL
- ▶  $V_2 = V_i - V_f = 20.009 \text{ mL}$
- ▶  $M_2$  (Molarity of NaOH) = 0.1 M
- ▶  $V_1$  (Volume of HCl) = 20 mL
- ▶  $M_1 V_1 = M_2 V_2$
- ▶  $M_1 * 20 = 0.1 * 20.009$
- ▶  $M_1 = 0.1 \text{ M}$



# Calculations



# Calculations

- ▶  $V_i$  (Initial buret reading of HCl) = 50 mL
- ▶  $V_f$  (Final buret reading) = 29.991 mL
- ▶  $V_2 = V_i - V_f = 20.009 \text{ mL}$
- ▶  $M_2$  (Molarity of HCl) = 1 M
- ▶  $V_1$  (Volume of  $\text{NH}_3$ ) = 20 mL
- ▶  $M_1 V_1 = M_2 V_2$
- ▶  $M_1 * 20 = 1 * 20.009$
- ▶  $M_1 = 1 \text{ M}$



# Summary



# Summary

**We have learnt to standardise:**

- ▶ **Strong-Acid with Strong-Base**
- ▶ **Strong-Acid with Weak-Base**
- ▶ **using titration method**



# Assignment



# Assignment

1. **Standardize a solution of ethanoic acid (acetic acid) using titration method**



# Assignment

1. **Standardize a solution of ethanoic acid (acetic acid) using titration method**
2. **Hint: All the necessary solutions and apparatus are available in default lab setup window**



# About the Spoken Tutorial Project

- ▶ Watch the video available at [http://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ It summarises the Spoken Tutorial project
- ▶ If you do not have good bandwidth, you can download and watch it



# Spoken Tutorial Workshops

## The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to [contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)



# Forum for specific questions

- ▶ Do you have questions in **THIS Spoken Tutorial?**
- ▶ Please visit <http://forums.spoken-tutorial.org>
- ▶ Choose the minute and second where you have the question
- ▶ Explain your question briefly
- ▶ Someone from our team will answer them



# Acknowledgements

- ▶ **Spoken Tutorial Project is a part of the Talk to a Teacher project**
- ▶ **It is supported by the National Mission on Education through ICT, MHRD, Government of India**
- ▶ **More information on this Mission is available at**

<http://spoken-tutorial.org /NMEICT-Intro>

