

Buffer Solutions

Spoken Tutorial Project

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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Learning Objectives



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We will learn to,



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We will learn to,

- ▶ **Prepare 0.5 M Acetate buffer of pH 3.6**



Learning Objectives

We will learn to,

- ▶ **Prepare 0.5 M Acetate buffer of pH 3.6**
- ▶ **Test the buffering action with small amounts of acid and base**



Pre-requisites



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▶ ChemCollective Vlabs interface



Pre-requisites

- ▶ **ChemCollective Vlabs interface**
- ▶ **If not for relevant tutorials please visit our website**
www.spoken-tutorial.org



System Requirement



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▶ Mac OS v 10.10.5



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



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



Buffer Solutions



Buffer Solutions

A buffer solution,

- ▶ **is composed of a weak acid or weak base and its conjugate salt**



Buffer Solutions

A buffer solution,

- ▶ **is composed of a weak acid or weak base and its conjugate salt**
- ▶ **Its pH changes very little when a small amount of acid or base is added to it**



Henderson–Hasselbalch Equation



Henderson–Hasselbalch Equation

$$pH = pK_a + \log[A^-]/[HA]$$



Buffer Solutions-Tutorial



Buffer Solutions-Tutorial

- ▶ Please refer to the excellent tutorial on buffers at the following link:

<http://chemcollective.org/activities/tutorials/buffers/buffers1>



Acetate Buffer Solution



Acetate Buffer Solution

S. No	pH	Volume of 0.5 M Acetic Acid	Volume of 0.5 M Sodium Acetate
1	3.6	46.3	3.7
2	4	41	9
3	4.4	31.5	18.5
4	5	14.7	35.3
5	5.6	4.7	45.3



Summary



Summary

We have learnt to,

- ▶ **Prepare 0.5 M Acetate buffer of pH 3.6**
- ▶ **Tested buffering action with small amounts of HCl and NaOH**



Assignment



Assignment

1. Prepare pH 5.0 Acetate buffer



Assignment

1. **Prepare pH 5.0 Acetate buffer**
2. **Test with small amounts of acid and base**



Assignment

1. **Prepare pH 5.0 Acetate buffer**
2. **Test with small amounts of acid and base**
3. **Hint: use 14.7 ml of 0.5 M Acetic acid and 35.3 ml of 0.5 M Sodium acetate**



About the Spoken Tutorial Project

- ▶ Watch the video available at 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



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>

