pH Scale

Talk to a Teacher
http://spoken-tutorial.org
National Mission on Education through ICT
http://sakshat.ac.in

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Learning Objectives

We will learn,

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▶ **How to use interactive PhET simulation, pH scale**

Pre-requisites

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▶ **Learners should be familiar with topics in high school science**

System Requirement

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- **Ubuntu Linux OS v 14.04**

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- **Java v 1.7.0**

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- ▶ **Ubuntu Linux OS v 14.04**
- ▶ **Java v 1.7.0**
- ▶ **Firefox web browser v 53.02.2**

Learning Goals

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Using this simulation we will learn to

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▶ **Determine whether a given solution is an acid or a base**

Learning Goals

Using this simulation we will learn to

▶ **Determine whether a given solution is an acid or a base**

▶ **Arrange acids and bases according to their strength**

▶ **Determine the concentration of OH^-, H_3O^+ and H_2O at a given pH**

Learning Goals

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Using this simulation we will learn about,

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Using this simulation we will learn about,

▶ **pH of a solution**

Learning Goals

Using this simulation we will learn about,

- ▶ **pH of a solution**
- ▶ **Effect of dilution on pH of solution**

Learning Goals

Using this simulation we will learn about,

▶ **pH of a solution**

▶ **Effect of dilution on pH of solution**

▶ **Logarithmic and Linear scale**

pH scale

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▶ **Numeric scale used to specify the acidity or basicity of an aqueous solution**

pH scale

▶ **Numeric scale used to specify the acidity or basicity of an aqueous solution**

▶ **pH is a measure of hydrogen ion concentration in mol/L**

Formula for pH calculation

- ▶ **pH is negative logarithm to base 10 of hydrogen ion concentration**

Formula for pH calculation

▶ **pH is negative logarithm to base 10 of hydrogen ion concentration**

▶ $pH = -log[H^+]$

pH for Acids, Bases and Neutral Solutions

pH for Acids, Bases and Neutral Solutions

► **For acidic solutions,** $pH < 7$

pH for Acids, Bases and Neutral Solutions

▶ **For acidic solutions,** $pH < 7$

▶ **For basic solutions,** $pH > 7$

pH for Acids, Bases and Neutral Solutions

▶ **For acidic solutions,** $pH < 7$

▶ **For basic solutions,** $pH > 7$

▶ **For neutral solutions, pH = 7**

Link for PhET simulation

Link for PhET simulation

http://phet.colorado.edu

pH of acids and bases

▶ **According to the above pH values the order is as follows**
Hand soap > Blood > Orange Juice > Battery Acid

Assignment

As an assignment,

1. **Check the pH of each liquid**
2. **Arrange the liquids according to the pH range**

Assignment

Assignment

As an assignment,

1. **Measure the pH of Blood sample**
2. **Observe the change in Molecule Count and H_3O^+/OH^- ratio after dilution**

Assignment

As an assignment,

1. **Make solutions of pH 7.0 and 9.0**
2. **Observe and compare the change in molecules**

Summary

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We have learnt about,

Summary

We have learnt about,

▶ **Interactive PhET simulation, pH Scale**

Summary I

▶ **Determine whether a given solution is an acid or a base**

▶ **Arrange acids and bases according to their strength**

▶ **Determine the concentration of H_3O^+, OH^- and H_2O at a given pH**

Summary II

- ► **pH of a solution**
- ► **Effect of dilution on pH of solution**
- ► **Logarithmic and Linear scale**

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**

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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

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▶ **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