# Oxidation-Reduction Analysis of Hydrogen Peroxide

Many oxidation-reduction reactions serve as a basis for quantitative analysis. One of the most widely used oxidizing agents is potassium permanganate, KMnO4. It is a powerful oxidizing agent that also serves as a self-indicator. One drop in excess of the endpoint volume of a titration turns the solution a pale-pink color.

In this experiment, you will titrate a standardized solution of 0.02 M KMnO<sub>4</sub> into a measured amount of an unknown concentration of hydrogen peroxide, H<sub>2</sub>O<sub>2</sub>. Your objective is to determine the percentage and molarity of H<sub>2</sub>O<sub>2</sub> in ordinary over-the-counter solutions of hydrogen peroxide.

#### Pre-Lab Assignment:

Balance the equation for the titration reaction using the half-reaction method. The reaction takes place in acidic conditions. (Record your work in your lab notebook.)

$$H_2O_2$$
 (aq) +  $MnO_4^-$  (aq)  $\rightarrow O_2$  (g) +  $Mn^{2+}$  (aq)

#### Materials

2 burets
Erlenmeyer flasks
Stir plate
Magnetic stir bar
Balance
Household hydrogen peroxide
0.02M potassium permanganate solution
3.0 M sulfuric acid
0.1M manganese(II) sulfate
Distilled water

#### PROCEDURE

- 1. Obtain and wear goggles.
- Rinse and fill a buret with standardized KMnO4 solution. Record the molarity of the solution.
- Determine the mass of a clean, dry Erlenmeyer flask to the correct number of significant figures, and record.
- From the buret on the front table, record the initial volume (again, to the correct number of significant figures). Add approximately 1.5 mL of ordinary household hydrogen peroxide. Record the final buret volume.
- 5. Find the mass of the flask with the peroxide and record.
- Add about 35 mL of distilled water, 5 mL of 3.0 M H<sub>2</sub>SO<sub>4</sub>, and 3 or 4 drops of 0.1 M MnSO<sub>4</sub>, which acts as a catalyst.

# **Analysis Of Hydrogen Peroxide Lab Answers**

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# **Table of Contents Analysis Of Hydrogen Peroxide Lab Answers**

- 1. Understanding the eBook Analysis Of Hydrogen Peroxide Lab Answers
  - The Rise of Digital Reading Analysis Of Hydrogen Peroxide Lab Answers
  - Advantages of eBooks Over Traditional Books
- 2. Identifying Analysis Of Hydrogen Peroxide Lab Answers
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Analysis Of Hydrogen Peroxide Lab Answers
  - User-Friendly Interface
- 4. Exploring eBook Recommendations from Analysis Of Hydrogen Peroxide Lab Answers
  - Personalized Recommendations
  - Analysis Of Hydrogen Peroxide Lab Answers User Reviews and Ratings
  - Analysis Of Hydrogen Peroxide Lab Answers and Bestseller Lists

- 5. Accessing Analysis Of Hydrogen Peroxide Lab Answers Free and Paid eBooks
  - o Analysis Of Hydrogen Peroxide Lab Answers Public Domain eBooks
  - Analysis Of Hydrogen Peroxide Lab Answers eBook Subscription Services
  - Analysis Of Hydrogen Peroxide Lab Answers Budget-Friendly Options
- 6. Navigating Analysis Of Hydrogen Peroxide Lab Answers eBook Formats
  - o ePub, PDF, MOBI, and More
  - Analysis Of Hydrogen Peroxide Lab Answers Compatibility with Devices
  - Analysis Of Hydrogen Peroxide Lab Answers Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Analysis Of Hydrogen Peroxide Lab Answers
  - Highlighting and Note-Taking Analysis Of Hydrogen Peroxide Lab Answers
  - Interactive Elements Analysis Of Hydrogen Peroxide Lab Answers
- 8. Staying Engaged with Analysis Of Hydrogen Peroxide Lab Answers
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - o Following Authors and Publishers Analysis Of Hydrogen Peroxide Lab Answers
- 9. Balancing eBooks and Physical Books Analysis Of Hydrogen Peroxide Lab Answers
  - ∘ Benefits of a Digital Library
  - Creating a Diverse Reading Collection Analysis Of Hydrogen Peroxide Lab Answers
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Analysis Of Hydrogen Peroxide Lab Answers
  - Setting Reading Goals Analysis Of Hydrogen Peroxide Lab Answers
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Analysis Of Hydrogen Peroxide Lab Answers
  - Fact-Checking eBook Content of Analysis Of Hydrogen Peroxide Lab Answers
  - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks
- 14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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