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 KMnO₄ into a measured amount of an unknown concentration of hydrogen peroxide, H₂O₂. Your objective is to determine the percentage and molarity of H₂O₂ 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 H₂SO₄, and 3 or 4 drops of 0.1 M MnSO₄, which acts as a catalyst.

Analysis Of Hydrogen Peroxide Lab Answers

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Reports, 1994 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database Annual Report ... and Findings Update National Acid Precipitation Assessment Program (U.S.). Office of the Director, 1988 **Energy** EPA Publications Bibliography, 1984-1990: Report summaries United States. Research Abstracts ,1990 Environmental Protection Agency, 1990 Government-wide Index to Federal Research & Development Reports ,1967 EPA Publications Bibliography Quarterly Abstract Bulletin United States. Environmental Protection Agency, 1995-04 Soil/water Science Research in the Plant Science Department ... Annual Report ,1992 Integrated Approach to Coordination Chemistry Rosemary A. Marusak, Kate Doan, Scott D. Cummings, 2007-03-07 Coordination chemistry is the study of compounds formed between metal ions and other neutral or negatively charged molecules This book offers a series of investigative inorganic laboratories approached through systematic coordination chemistry. It not only highlights the key fundamental components of the coordination chemistry field it also exemplifies the historical development of concepts in the field In order to graduate as a chemistry major that fills the requirements of the American Chemical Society a student needs to take a laboratory course in inorganic chemistry Most professors who teach and inorganic chemistry laboratory prefer to emphasize coordination chemistry rather than attempting to cover all aspects of inorganic chemistry because it keeps the students focused on a cohesive part of inorganic chemistry which has applications in medicine the environment molecular biology organic synthesis and inorganic materials Air Pollution Abstracts, 1972 Use of Services for Family Planning and Infertility, United States Gerry E. Hendershot, Karl E. Bauman, 1988 OTS Selective Bibliography United States. Dept. of Commerce. Office of Technical Services, **EPA Publications Bibliography** United States. Environmental Protection Technical Abstract Bulletin ,1964 Agency, 1985

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