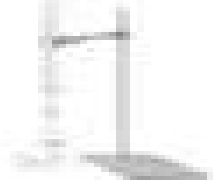




AP Chem Investigation 12 – Redox Titration Lab



Name KIT Period

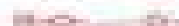
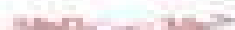
- Check to be sure you have at least 20 mL of KMnO_4 in your buret. If not, add some KMnO_4 to your buret.
- Be sure there are no air bubbles in the buret. If there are, stretch some KMnO_4 out of the buret into a waste beaker until the air bubble comes out. Now run down the solution down the side with running water.
- Take an initial reading of KMnO_4 from the buret. Record this value in the data table.
- Measure out exactly 1.00 mL of H_2O_2 using a graduated pipet and add it to a clean flask.
- Add 50 mL of 0.1M H_2SO_4 to the flask using a graduated cylinder. This is so that the titration can occur in acidic conditions.
- Add water to the flask to bring the solution up to about 50-60 mL of volume. (This is just to improve your ability to see the color change at the endpoint. Adding water will not affect the number of moles of H_2O_2 present in the flask, so it won't affect the volume of titrant required to reach the equivalence point).
- Titrate the H_2O_2 to the endpoint (until a first-pink color persists). Try not to add even just a drop of KMnO_4 past the endpoint! Record the volume of titrant.
- Dump your solution down the sink. Leave the leftover KMnO_4 in your buret for the next class.
- Check the label on the KMnO_4 bottle and record the molarity of the KMnO_4 solution in your data section.

Data Table

Volume of H_2O_2 (pipetted)	1.00 mL
Initial reading of KMnO_4 volume on buret	14.11 mL
Final reading of KMnO_4 volume on buret	17.41 mL
Concentration of KMnO_4 solution on bottle	0.0250 M

Questions

- Balance the equation below using the half-reaction method. Show all work.



- What volume of KMnO_4 was added to reach the endpoint?

$$17.41 - 14.11 = 3.30 \text{ mL}$$

- Knowing the volume and concentration of KMnO_4 , how many moles of KMnO_4 were added to reach the endpoint?

$$3.30 \text{ mL} \times (0.0250 \text{ mol/L}) \times (1000 \text{ mL/L}) = 8.25 \times 10^{-5} \text{ mol}$$

- Using the balanced equation, how many moles of H_2O_2 were in your sample? **Remember 2KMnO_4 to $2\text{H}_2\text{O}_2$ in the balanced equation.*

$$8.25 \times 10^{-5} \text{ mol } 2\text{KMnO}_4 \times \text{Chemical } \text{H}_2\text{O}_2: 2 \text{ mol } \text{H}_2\text{O}_2 \times 8.25 \times 10^{-5} \text{ mol } 2\text{KMnO}_4$$

- Convert the moles of H_2O_2 to grams.

$$8.25 \times 10^{-5} \text{ mol } \text{H}_2\text{O}_2 \times (34.02 \text{ g/mol}) = 0.00281 \text{ g}$$

- Imagine that your sample of H_2O_2 was mostly water and contained very little H_2O_2 molecules. If it was mostly water, it would be expected to have a density similar to water. The density of water is 1.00 g/mL. Let's assume the sample had a density of 1.00 g/mL. Using the mass of H_2O_2 calculated in the previous question along with the fact that your sample was exactly 10.00 mL, calculate the percentage of your sample that was H_2O_2 .

$$(0.00281 \text{ g} / 1.00 \text{ g}) \times 100\% = 0.281\%$$

- The label on the bottle states that the bottle of H_2O_2 is a 3% solution. Compare this value to your calculation in the previous question. Is this labeled correct? Why or why not? *The 3% is because H_2O_2 breaks down over time.*

- Is it necessary to know the exact volume of...

a) H_2O_2 sample added to the flask?

b) water added to the flask?

c) KMnO_4 added to the flask?

yes

no

yes

Ap Chem Titration Lab Answers

Bobrow Test Preparation Services

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Ap Chem Titration Lab Answers:

CliffsNotes AP Chemistry Bobrow Test Preparation Services, 2009-02-09 The book itself contains chapter length subject reviews on every subject tested on the AP Chemistry exam as well as both sample multiple choice and free response questions at each chapter's end Two full length practice tests with detailed answer explanations are included in the book

Illustrated Guide to Home Chemistry Experiments Robert Bruce Thompson, 2012-02-17 For students DIY hobbyists and science buffs who can no longer get real chemistry sets this one of a kind guide explains how to set up and use a home chemistry lab with step by step instructions for conducting experiments in basic chemistry not just to make pretty colors and stinky smells but to learn how to do real lab work Purify alcohol by distillation Produce hydrogen and oxygen gas by electrolysis Smelt metallic copper from copper ore you make yourself Analyze the makeup of seawater bone and other common substances Synthesize oil of wintergreen from aspirin and rayon fiber from paper Perform forensics tests for fingerprints blood drugs and poisons and much more From the 1930s through the 1970s chemistry sets were among the most popular Christmas gifts selling in the millions But two decades ago real chemistry sets began to disappear as manufacturers and retailers became concerned about liability The *Illustrated Guide to Home Chemistry Experiments* steps up to the plate with lessons on how to equip your home chemistry lab master laboratory skills and work safely in your lab The bulk of this book consists of 17 hands on chapters that include multiple laboratory sessions on the following topics Separating Mixtures Solubility and Solutions Colligative Properties of Solutions Introduction to Chemical Reactions Stoichiometry Reduction Oxidation Redox Reactions Acid Base Chemistry Chemical Kinetics Chemical Equilibrium and Le Chatelier's Principle Gas Chemistry Thermochemistry and Calorimetry Electrochemistry Photochemistry Colloids and Suspensions Qualitative Analysis Quantitative Analysis Synthesis of Useful Compounds Forensic Chemistry With plenty of full color illustrations and photos *Illustrated Guide to Home Chemistry Experiments* offers introductory level sessions suitable for a middle school or first year high school chemistry laboratory course and more advanced sessions suitable for students who intend to take the College Board Advanced Placement AP Chemistry exam A student who completes all of the laboratories in this book will have done the equivalent of two full years of high school chemistry lab work or a first year college general chemistry laboratory course This hands on introduction to real chemistry using real equipment real chemicals and real quantitative experiments is ideal for the many thousands of young people and adults who want to experience the magic of chemistry

Using Constructivism in Teaching AP Chemistry Avidah Lotfi, 2004 **Laboratory Experiments for General Chemistry** Harold R. Hunt, Toby F. Block, George M. McKelvy, 1998 *Cracking the AP Chemistry Exam, 2019 Edition* The Princeton Review, 2018-11-06 Make sure you're studying with the most up to date prep materials Look for The Princeton Review's *Cracking the AP Chemistry Exam 2020* ISBN 9780525568186 on sale August 2019 Publisher's Note Products purchased from third party sellers are not guaranteed by the publisher for quality or authenticity and may not

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