

AP Chemistry Lab 07

Investigation 3 *What Makes Hard Water Hard?*

Central Challenge

Samples of tap water have been collected from faculty members who live in different townships, villages, cities, and counties. Some are from municipal water sources, others are from wells. The water will be analyzed for their quantities of water hardness through principles of metal ion precipitation and separation. The samples will then be ranked in order of increasing water hardness.

Context for This Investigation

When relocating, there are many factors that go into choosing where to buy a house. One of those factors is water quality – it is advantageous to find a location where a water softener will not be needed. Hard water costs more for detergent, plumbing repairs, and appliance maintenance and replacement. Having water that is already soft is preferred to installing a water softening system. You, the students, will identify which of the areas around Western New York have the lowest hard water quantities by ranking the hardness of the water in the areas.

Materials

Distilled water	Metal scoops	250 mL Erlenmeyer flasks (optional)
Calcium chloride, anhydrous (for practice)	250 mL beakers	Buchner funnels with stoppers
Sodium carbonate, anhydrous (for practice)	100 mL graduated cylinders	Glass tubing (optional)
Wash bottles	Watch glasses	Ring stand
Analytical balances	250 mL side-arm flasks (filter flasks)	Drying oven
Clamps	Aspirators	Filter papers
Double hole rubber stoppers (optional)		Water samples

Safety and Disposal

All solutions can be flushed down the drain. Normal laboratory precautions, including wearing goggles at all times, should be taken as these solutions may be harmful if swallowed and can irritate the eyes.

Prelab Guiding Questions/Simulations

Ap Chemistry Lab Answers

Johns Hopkins University



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AP Chemistry For Dummies Peter J. Mikulecky, Michelle Rose Gilman, Kate Brutlag, 2008-11-13 A practical and hands on guide for learning the practical science of AP chemistry and preparing for the AP chem exam Gearing up for the AP Chemistry exam AP Chemistry For Dummies is packed with all the resources and help you need to do your very best Focused on the chemistry concepts and problems the College Board wants you to know this AP Chemistry study guide gives you winning test taking tips multiple choice strategies and topic guidelines as well as great advice on optimizing your study time and hitting the top of your game on test day This user friendly guide helps you prepare without perspiration by developing a pre test plan organizing your study time and getting the most out of your AP course You ll get help understanding atomic structure and bonding grasping atomic geometry understanding how colliding particles produce states and so much more To provide students with hands on experience AP chemistry courses include extensive labwork as part of the standard curriculum This is why the book dedicates a chapter to providing a brief review of common laboratory equipment and techniques and another to a complete survey of recommended AP chemistry experiments Two full length practice exams help you build your confidence get comfortable with test formats identify your strengths and weaknesses and focus your studies You ll discover how to Create and follow a pretest plan Understand everything you must know about the exam Develop a multiple choice strategy Figure out displacement combustion and acid base reactions Get familiar with stoichiometry Describe patterns and predict properties Get a handle on organic chemistry nomenclature Know your way around laboratory concepts tasks equipment and safety Analyze laboratory data Use practice exams to maximize your score Additionally you ll have a chance to brush up on the math skills that will help you on the exam learn the critical types of chemistry problems and become familiar with the annoying exceptions to chemistry rules Get your own copy of AP Chemistry For Dummies to build your confidence and test taking know how so you can ace that exam **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 America's Lab Report National Research Council, Division of Behavioral and Social Sciences and Education, Center for Education, Board on Science Education, Committee on High School Laboratories: Role and Vision, 2005-12-20 Laboratory experiences as a part of most U S high school science curricula have been taken for granted for decades but they have rarely been carefully examined What do they contribute to science learning What can they contribute to science learning What is the current status of labs in our nation s high schools as a context for learning science This book looks at a range of questions about how laboratory experiences fit into U S high schools What is effective laboratory teaching What does research tell us about learning in high school science labs How should student learning in laboratory experiences be assessed Do all student have access to

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1. Understanding the eBook Ap Chemistry Lab Answers
 - The Rise of Digital Reading Ap Chemistry Lab Answers
 - Advantages of eBooks Over Traditional Books
2. Identifying Ap Chemistry 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 Ap Chemistry Lab Answers
 - User-Friendly Interface
4. Exploring eBook Recommendations from Ap Chemistry Lab Answers
 - Personalized Recommendations
 - Ap Chemistry Lab Answers User Reviews and Ratings
 - Ap Chemistry Lab Answers and Bestseller Lists
5. Accessing Ap Chemistry Lab Answers Free and Paid eBooks
 - Ap Chemistry Lab Answers Public Domain eBooks
 - Ap Chemistry Lab Answers eBook Subscription Services

- Ap Chemistry Lab Answers Budget-Friendly Options
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 - Ap Chemistry Lab Answers Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Ap Chemistry Lab Answers
 - Highlighting and Note-Taking Ap Chemistry Lab Answers
 - Interactive Elements Ap Chemistry Lab Answers
- 8. Staying Engaged with Ap Chemistry Lab Answers
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Ap Chemistry Lab Answers
- 9. Balancing eBooks and Physical Books Ap Chemistry Lab Answers
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Ap Chemistry Lab Answers
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Ap Chemistry Lab Answers
 - Setting Reading Goals Ap Chemistry Lab Answers
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Ap Chemistry Lab Answers
 - Fact-Checking eBook Content of Ap Chemistry 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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