

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

Gary S. Thorpe



Ap Chemistry Lab Answers:

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 *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 laboratory experiences What changes need to be made to improve laboratory experiences for high school students How can school organization contribute to effective laboratory teaching With increased attention to the U S education system and student outcomes no part of the high school curriculum should escape scrutiny This timely book investigates factors that

influence a high school laboratory experience looking closely at what currently takes place and what the goals of those experiences are and should be Science educators school administrators policy makers and parents will all benefit from a better understanding of the need for laboratory experiences to be an integral part of the science curriculum and how that can be accomplished

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

The Success Criteria Playbook John Almarode,Douglas Fisher,Kateri Thunder,Nancy Frey,2021-02-05 Provide students a clear view of what success looks like for any process task or product What does success look like for your students How will they know if they have learned This essential component of teaching and learning can be difficult to articulate but is vital to achievement for both teachers and students The Success Criteria Playbook catapults teachers beyond learning intentions to define clearly what success looks like for every student whether face to face or in a remote learning environment Designed to be used collaboratively in grade level subject area teams or even on your own the step by step playbook expands teacher understanding of how success criteria can be utilized to maximize student learning and better engage learners in monitoring and evaluating their own progress Each module is designed to support the creation and immediate implementation of high quality high impact success criteria and includes Templates that allow for guided and independent study for teachers Extensive STEM focused examples from across the K 12 STEM curriculum to guide teacher learning and practice Examples of success criteria applied across learning domains and grades including high school content skills practices dispositions and understandings Ensure equity of access to learning and opportunity for all students by designing and employing high quality high impact success criteria that connect learners to a shared understanding of what success looks like for any given learning intention

Report of the Johns Hopkins University Johns Hopkins University,1882

Report of the President of the Johns Hopkins University, Baltimore, Maryland Johns Hopkins University,1880

Annual Report of the Biological Laboratory Biological Laboratory (Cold Spring Harbor, N.Y.),1924

Third (-Twenty-eighth) annual report (of the president). Johns Hopkins university,1882

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Annual Report of the President of the Johns Hopkins University, Baltimore, Maryland Johns Hopkins University,1874

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