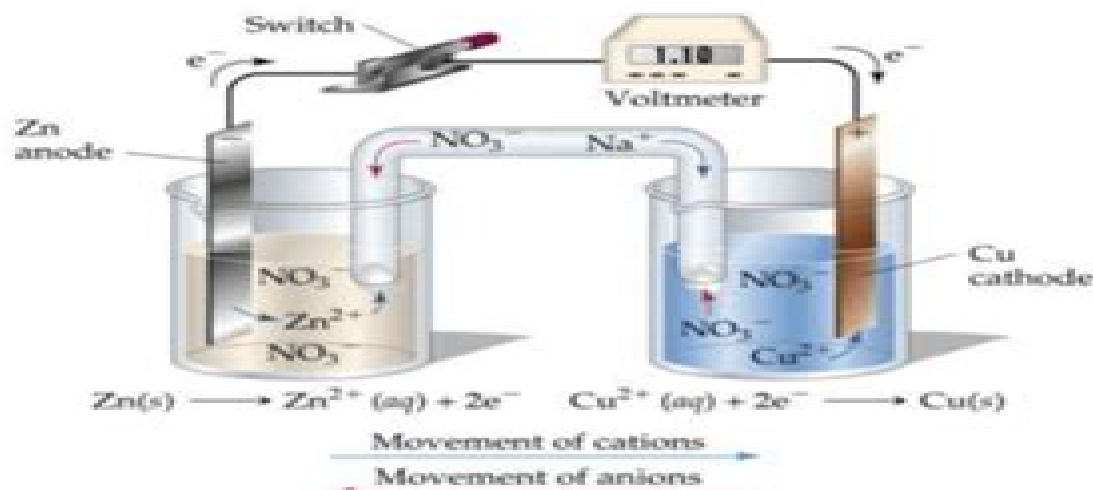


Names: \_\_\_\_\_

**Report for experiment 21G**  
**Electrochemistry: Galvanic Cells and Batteries**

**Introduction to electrochemical cells (a.k.a. galvanic cells or batteries):**

The energy produced by an **electrochemical cell** is due to a spontaneous redox reaction. An electrochemical cell consists of two **half-cells**. Each half-cell consists of an **electrode** (usually metal) submerged in its own salt. For example, the half-cell on the right in the figure below is made of a piece of copper submerged in a solution of copper nitrate. An oxidation reaction (loss of electrons) occurs in one of the half-cells and a reduction reaction (gain of electrons) occurs in the other half-cell. Each of these is called a **half reaction**. The **overall cell reaction** is the sum of the two half reactions. The electrode at which oxidation takes place is called the **anode**. The electrode at which reduction takes place is called the **cathode**. The two half cells are connected in two ways. The electrodes are connected by a wire and the salt solutions are connected by a "salt bridge". Electrons are lost by the anode and flow through the wire to the cathode. The electrons flow through the cathode until they touch the salt solution where they are taken up by cations in the solution. Thus, the metallic anode is oxidized and the cations in the cathode compartment are reduced. The cations resulting from the oxidation reaction at the anode enter the salt solution in the anode compartment. The uncharged metal atoms resulting from the reduction reaction stick to the cathode. Aqueous ions flow between the two half cells through the salt bridge to complete the electrical circuit. The cell potential (also called cell voltage) is basically the same thing as  $\Delta G$ . It tells you how much work a battery can do. It is the "driving force" for the reaction. It tells how far the reaction is from equilibrium. A positive cell potential means that the forward reaction is spontaneous. (This is the opposite of the sign convention for  $\Delta G$ .) When measuring the voltage of a cell with a voltmeter, the reaction does not take place because the voltmeter pushes the electrons back toward the anode. An ammeter reads the current (rate of current flow in Amps = coulombs/sec) as electrons flow from the anode to the cathode.



# Galvanic Cell Lab Report

**United States. National Aeronautics  
and Space Administration Scientific  
and Technical Information Division**

## **Galvanic Cell Lab Report:**

*Working with Chemistry* Donald J. Wink, Sharon Fetzer-Gislason, Julie Ellefson Kuehn, 2004-02-20 With this modular laboratory program students build skills using important chemical concepts and techniques to the point where they are able to design a solution to a scenario drawn from a professional environment The scenarios are drawn from the lives of people who work with chemistry every day ranging from field ecologists to chemical engineers and include many health professionals as well

**Scientific and Technical Aerospace Reports** ,1988-10 Chemistry (Teacher Guide) Dr. Dennis Englin, 2018-02-26 This book was created to help teachers as they instruct students through the Master s Class Chemistry course by Master Books The teacher is one who guides students through the subject matter helps each student stay on schedule and be organized and is their source of accountability along the way With that in mind this guide provides additional help through the laboratory exercises as well as lessons quizzes and examinations that are provided along with the answers The lessons in this study emphasize working through procedures and problem solving by learning patterns The vocabulary is kept at the essential level Practice exercises are given with their answers so that the patterns can be used in problem solving These lessons and laboratory exercises are the result of over 30 years of teaching home school high school students and then working with them as they proceed through college Guided labs are provided to enhance instruction of weekly lessons There are many principles and truths given to us in Scripture by the God that created the universe and all of the laws by which it functions It is important to see the hand of God and His principles and wisdom as it plays out in chemistry This course integrates what God has told us in the context of this study Features Each suggested weekly schedule has five easy to manage lessons that combine reading and worksheets Worksheets quizzes and tests are perforated and three hole punched materials are easy to tear out hand out grade and store Adjust the schedule and materials needed to best work within your educational program Space is given for assignments dates There is flexibility in scheduling Adapt the days to your school schedule Workflow Students will read the pages in their book and then complete each section of the teacher guide They should be encouraged to complete as many of the activities and projects as possible as well Tests are given at regular intervals with space to record each grade About the Author DR DENNIS ENGLIN earned his bachelor s from Westmont College his master of science from California State University and his EdD from the University of Southern California He enjoys teaching animal biology vertebrate biology wildlife biology organismic biology and astronomy at The Master s University His professional memberships include the Creation Research Society the American Fisheries Association Southern California Academy of Sciences Yellowstone Association and Au Sable Institute of Environmental Studies

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Space Administration Scientific and Technical Information Division,1967      **A Selected Listing of NASA Scientific and Technical Reports for 1966** United States. National Aeronautics and Space Administration. Scientific and Technical Information Division,1967      **Experimental Physical Chemistry** Arthur Halpern,George McBane,2006-06-30 Experimental Physical Chemistry includes complete lists of necessary materials detailed background material for each experiment and relevant sections on measurements and error analysis

The Top Books of the Year Galvanic Cell Lab Report The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous compelling novels captivating the hearts of readers worldwide. Lets delve into the realm of popular books, exploring the engaging narratives that have captivated audiences this year. Galvanic Cell Lab Report : Colleen Hoover's "It Ends with Us" This poignant tale of love, loss, and resilience has gripped readers with its raw and emotional exploration of domestic abuse. Hoover skillfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can prevail. Galvanic Cell Lab Report : Taylor Jenkins Reid's "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reid's absorbing storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Galvanic Cell Lab Report : Delia Owens' "Where the Crawdads Sing" This captivating coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens crafts a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a brilliant and gripping novel that will keep you wondering until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

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