ACS Chemistry for Life®

SCALACS

A Joint Publication of the Southern California and San Gorgonio Sections of the American Chemical Society

VOLUME LXXVIII/No. 2 MARCH 2023

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CHAIR'S MESSAGE

ACS Local Section
Southern California

Dear SCALACS members,

In my second month as Chair of SCALACS, I find myself thinking about chemical education and the importance of access to higher level science and math courses at younger ages for under-represented students. As an undergraduate chemical engineer in the 1980s, approximately 1 in 5 students in my classes were female. Recent statistics suggest that women represented 1 in 4 chemical engineers in 2021, up from 1 in 5 in 2010. As of 2021, fewer than 10% of chemical engineers were Hispanic, and fewer than 4% of chemical engineers were Black. These percentages are less than half the national representation for all the aforementioned groups. The percentages for chemists are better for women (approximately 35% of chemists in the U.S. are female), but in similar ranges to chemical engineering for people who identify as Black or Hispanic.

Researchers have tried to understand the causes for these discrepancies and identify ways to increase the percentage representation of under-represented groups in STEM fields. Increasing the number of women in STEM has been one of my passions in life. As Chair at SCALACS this year, I am hoping to continue my work with bringing the fun of chemistry to a wider audience. One of my guiding beliefs that has developed through my 27 years of teaching chemistry is that while we cannot make the concepts of chemistry any less difficult, we can make them more accessible. Looking back at the ways I learned concepts in college, I realize that most of my learning occurred when I would sit and ponder through how to do homework problems with fellow students. We would thrash through different ideas, bouncing our knowledge off one another. Then, when no one could move forward on a problem, we went to the "bible" (that's what we called them back in the day) of the course from someone who had previously taken the class. In these "bibles," we could find all the solutions to the problem sets professors had doled out to prior years' students.

When I first began my teaching career, I viewed my work as a post-doctoral position (I graduated with a Ph.D. in Chemical Engineering and decided to try high school teaching.) After a few years of teaching, I recognized how much I loved the work and decided to stick with this career rather than move back to research/academia. I also began to recognize that I could possibly impact the lives of younger students by exposing them to my love of all things chemistry. My school had a very diverse group of students, and many found that they enjoyed chemistry. Several years later, I moved to an all-girls school. Throughout my teaching career, I have tried many different modes of teaching to make chemistry more accessible to students. What I have found is that the way I learned chemical engineering and math in college is the pathway for more of the students at my school to feel successful in their pursuits of STEM fields. Fifteen years ago, I was happy if 20% of the sophomores took Honors Chemistry. After switching my teaching methods, 50% of students taking Honors Chemistry became typical. I have not changed my test concepts, and the test scores have not gone down, but my teaching methods look nothing like they did when I first began teaching.

(Continued on page 2)

(Continued from page 1)

This change began when I went to a technology in education conference and sat in a session on "flipped learning." (Students watch videos of lectures at home rather than having the teacher lecture during class.)

The following year, I switched all my courses to this mode of teaching – but I did something additional – I created complete solutions of all the questions that I gave for classwork and homework. Approximately 20% of homework was watching a video lecture, and 80% of the homework was traditional homework. In class, students worked together to solve chemistry problems, and they had complete solutions available to them. My AP Chemistry course numbers began to grow tremendously. About 20% of students would take AP Chemistry (with a 90-100% pass rate) before the switch in teaching methods. Today, we typically have 40% of the student population taking AP Chemistry with the same pass rate. That's 40% of students at an all-girls school take AP Chemistry with a 90-100% pass rate!

That is mind-boggling to me. I think people would be hard-pressed to find a school where 40% of the female population were taking an AP Chemistry course, let alone most, if not all, passing the AP Chemistry test. My friends tell me they believe it is because I am a good teacher, but I believe that it is my teaching method that has made the world of difference for my students. I believe it is time to give students the keys to our superbly difficult homework questions so that instead of struggling through the how and why of problem solving, they can learn from examples and learn how to work together. It was the "bibles" and the experience of working with groups on homework sets from my undergraduate days that helped me be a better teacher for my students. My classroom is full of chemistry problem-solving conversations. My students are learning to collaborate to solve complex chemistry problems. I believe that this mode of teaching can improve access to the more difficult STEM classes in high school and college so that students who might have lacked the grit to persevere through difficult problems can learn by example with solutions to these complex problems. This allows pre-college students to develop the joy of the "Aha" moment that comes with finally understanding the how and why of each problem type. Now I just have to just figure out how to convince more teachers to consider giving complete homework solutions to their students…

On that note, the ACS website has many chemistry resources for educators and students – lesson plans, science articles, podcasts, videos, and more at www.acs.org. **Chemists Celebrate Earth Week** kicks off on April 16 and this year's theme is "The Curious Chemistry of Amazing Algae." There will be a **CCEW Illustrated Poem Contest for K-12 students** (see page 7). Be sure to encourage your students to participate as winners will advance to national level and win cash prizes. Learn more at https://fal.cn/3vITE. As a reminder, the local **ACS High School Chemistry Olympiad** will be held on March 15 and 16. There is still time to enroll your students. Register online at scalacs.org or call SCALACS office, 626.327.1216.

We want to congratulate **Professor Alison Butler** as the **2022 Richard C. Tolman Award Recipien**t. She is the deserving Distinguished Professor of the Department of Chemistry & Biochemistry at University of California Santa Barbara. More information about the Richard C. Tolman Award Dinner honoring Professor Butler will be announced soon.

Lastly, I want to personally congratulate our **2023 Board of Governance.** We are committed to bring members to as many events as possible this year! For those who wish to volunteer with SCALACS, please contact the administrative office at office@scalacs.org.

Sincerely,
Edye Udell
Chair, SCALACS
Science Teacher, Westridge School
(EUdell@westridge.org)

2023 SCALACS Governance Election Results

Our Election for 2023 SCALACS Governance has concluded. This election was processed by ElectionBuddy.com. We thank all other members who submitted their votes.

The SCALACS Elected Governance for 2023 is as follows:

Elected Officers:
Chair: Edye Udell
Chair-Elect: Richard Kidd
Secretary/Treasurer: Barbara Belmont

Re-elected Councilors:
Barbara Sitzman (Jan. 2023 – Dec. 2025)
Veronica Jaramillo (Jan. 2023 – Dec. 2025)

Elected Alternate Councilors:
Krishna Kallury (Jan. 2023 – Dec. 2025)

Elected Executive Committee Members at Large:
David Hanna (Jan. 2023 – Dec. 2025)
Benjamin Ku (Jan. 2023 – Dec. 2025)
Sahar Roshandel (Jan. 2023 – Dec. 2025)

Continuing Councilors:
Brian Brady (Jan. 2021 – Dec. 2023)
Alexandros Oxyzolou (Jan. 2021 – Dec. 2023)
Eleanor Siebert (Jan. 2022 – Dec. 2024)
Robert de Groot (Jan. 2022 – Dec. 2024)

Continuing Alternate Councilors:
Gerald Delker (Jan. 2021 – Dec. 2023)
Miklos Czaun (Jan. 2021 – Dec. 2023)
Barbara Belmont (Jan. 2022 – Dec. 2024)
Michael Morgan (Jan. 2022 – Dec. 2024)

Continuing Executive Committee Members at Large:
Laurie Barge (Jan. 2021 – Dec. 2023)
Inessa Bychinskaya (Jan. 2021 – Dec. 2023)
Richard Kidd (May. 2021 – Dec. 2023)
Katherine Van Heuvelen (Jan. 2022 – Dec. 2024)

Election Date: December 1 - 31, 2022
Election Vendor: ElectionBuddy.com
Submitted by and certified by Barbara Belmont, SCALACS Secretary/Treasurer

Recent Advances in Covid-19 Testing Techniques

Krishna Kallury, SCALACS Alternate Councilor

Coronavirus disease 2019 (COVID-19) is a transmitted respiratory disease caused by the infection of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was discovered in December 2019 in Wuhan, China. With a high rate of infection, the COVID-19 pandemic has impacted every facet of society ranging from restaurants, businesses, academic institutions, travel and work environments, to nursing homes, hospital staff and treatment of patients with other life-threatening diseases. In essence, it cast a lasting impact across the global economy and health care systems and severely restricted the normal way of life. Countries around the world are yet to recover from these disruptions.

Despite the largely widespread availability of vaccines, testing remains important in order to monitor the evolution of the virus and the resulting stages of the pandemic. Currently, there are many tests available commercially for the detection of COVID-19. Some of these tests received approval for emergency use authorization (EUA) from the U.S. Food and Drug Administration (FDA). These tests fall into three main categories based on the targeted analyte: nucleic acid–based (NAT or molecular), antigen-based, and antibody-based testing methods. NAT or molecular tests can identify the infected subjects during the acute phase of infection by detecting the presence of viral nucleic acid in the tested sample. These molecular tests involve the use of polymerase chain reaction (PCR)-based techniques or rely on DNA–RNA hybridization for the detection of SARSCoV- 2 viral RNA. The second category are the antigen tests that involve the detection of the virus proteins either from saliva, nasal, or nasopharyngeal swabs, or even in the blood. The third category is the serological or immunological assay, which is an indirect method of detecting the virus as the test looks for developed antibodies as a response to the infection rather than detecting the virus itself. Serological tests detect the presence of antibodies in the blood when the body is responding to the viral infection. This type of test is important to identify the potential convalescent plasma donors and to monitor the subject's immune status over time.

PCR remains the gold standard technique since it is highly sensitive. The test procedure begins with isolating the RNA from the collected sample, followed by converting the RNA into complementary DNA (cDNA) and then amplifying the target using a polymerase. The discrimination of SARS-CoV-2 from other commonly reported respiratory viruses is also possible using this technique. The test can take a long, labor-intensive effort using specialized equipment, and must be performed by expert personnel. Transportation from the sample collection location to the testing laboratory makes the conventional RT-PCR process slower, taking nearly 48–72 hours to send the results back to the patients. The use of gold nanoparticles with a magnetic core to speed up the thermocycling process to detect SARS-CoV-2 using in situ fluorescence has been reported. The portable device relies on plasmonic heating through magnetoplasmonic nanoparticles (MPNs) to decrease the time needed for the RT-PCR from a few hours to 17 min. This approach is referred to as high-speed nanoPCR, and it consists of three main steps. First, RNA is extracted using a disposable RNA preparation kit with plungers for reagents mixing. Next, RT-PCR is performed with the assistance of magnetoplasmonic thermocycling. Finally, the fluorescence signal is detected to diagnose COVID-19 after applying an external magnetic field to remove the magnetoplasmonic nanoparticles. Using RT-q(PCR-LAMP) for COVID-19 diagnosis enables the detection of SARS-CoV-2 RNA of as few as five copies per reaction within a short time of 35 min for the amplification step (six cycles of PCR). Using the PCR1100 device, the whole amplification procedure takes less than 20 min and could achieve a sensitivity and specificity comparable to those of conventional real-time RT-PCR performed using thermocycler instruments.

(Continued on page 8)

Announcing the 2022 Richard C. Tolman Award Recipient

Professor Alison Butler
Dept. of Chemistry & Biochemistry,
University of California, Santa Barbara
is the 2022
Tolman Award recipient!

**Congratulations,
Professor Butler!**

We will honor Professor Butler at the Richard C. Tolman Award Dinner.
Look for more information in our next issue.

High School Chemistry Olympiad
March 15 & 16, 2023

The Southern California Section will hold the **ACS High School Chemistry Olympiad** on **March 15 and 16, 2023** at over 30 schools in the Los Angeles area. The event is designed to test a student's knowledge of a wide variety of topics in chemistry. If you know of a school or student that would like to participate, please **download** the letter and participation form **from our website** or contact **Gerald Delker** at **Delker@earthlink.net** for more information.

The top 12 scorers on the local exam are nominated to compete in the National Exam, which will take place on **April 22** at a location to be determined. The top 20 national winners are invited to attend an all-expense-paid, two-week study camp at the Air Force Academy. The top four finalists are then selected to represent the United States at the **55th International Chemistry Olympiad.** We will recognize the top local students with monetary awards and certificates. A banquet may be held in May depending on conditions. Check out the 54th International Chemistry Olympiad summary here: https://www.acs.org/content/dam/acsorg/education/students/highschool/olympiad/2022-usnco-summary-report.pdf

Participation fees start at **$8/student.** Fees may be paid online at https://scalacs.org/?page_id=236 or by check payable to SCALACS and mailed to SCALACS Administrative office. **Deadline for ONLINE registration is March 6. After this date, registration will be taken by PHONE only until March 13.** Call **(310) 327-1216.**

City of STEM Science Festival & Los Angeles Maker Faire

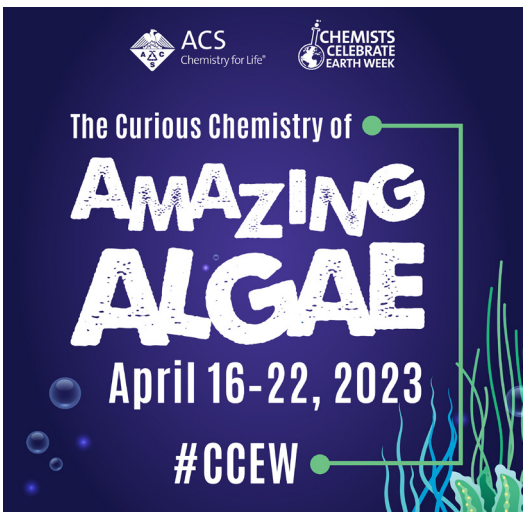
Saturday, April 1, 2023 from 9 am-5 pm at the LA State Historic Park

Save the date! City of STEM, LA's biggest celebration of science, technology, engineering and math, and the Los Angeles Maker Faire, the region's largest gathering of creative thinkers and doers, will both be taking place at the same time and at the same place on April 1, 2023. The Los Angeles Public Library and the Columbia Memorial Space Center have joined forces for the first time to bring these two major events together for one full day extravaganza of exploration, invention, creativity and fun! The combined LA Maker Faire and City of STEM events will take place on Saturday, April 1, 2023 from 9 am-5 pm at the LA State Historic Park in Downtown, near the Chinatown Metro stop.

LA Maker Faire and City of STEM combined create the greatest free outdoor festival of science and creativity of the year! Bringing these two huge events together on one day and in one place will give the public the opportunity to interact with over 200 booths highlighting organizations and innovators – including scientists, engineers, artists, major museums, NASA, and tech companies – who will showcase hands-on activities and unique experiences for the adults, teens, and kids in Los Angeles and beyond. SCALACS will be hosting a table. Contact **Veronica Jaramillo (vijaramillo@pasadena.edu)** if you are interested in volunteering at the SCALACS table.

Chemists Celebrate Earth Week

April 16-22, 2023



Celebrate CCEW the week of April 16-22, 2023 with the theme, "The Curious Chemistry of Amazing Algae." Algae are emerging as one of the most promising long-term, sustainable sources of food, feed, and other co-products. What makes them so attractive are the large number and wide variety of benefits associated with how and where they grow.

Nearly all these benefits stem from the fact that algae have evolved over billions of years to produce and store energy and they do this more efficiently than any other known natural or engineered process. Amazingly, more than half of the oxygen in our atmosphere comes from algae!

Continue reading about our **2023 CCEW Illustrated Poem Contest** on the following page.

2023 CCEW Illustrated Poem Contest
"The Curious Chemistry of Amazing Algae"

The Southern California Local Section of the American Chemical Society (ACS) is sponsoring an illustrated poem contest for students in kindergarten through 12th grade.

Contest Deadline: Monday, April 24th
Prizes: To be announced
Mail Your Entry to: SCALACS Administrative Office
2700 E Foothill Blvd, Suite 209, Pasadena CA 91107
Or Email to: office@scalacs.org or call (310) 327-1216 for information

Please include **Name, School, Address, Email**, and **Phone Number** with your entry. Read **Contest Rules** below. Winners of the Southern California Local Section's Illustrated Poem Contest will advance to the National Illustrated Poem Contest for a chance to be featured on the ACS website and to win prizes!

Write and illustrate a poem using the CCEW theme, **"The Curious Chemistry of Amazing Algae."** Your poem must be **no more** than 40 words and in the following styles to be considered:

HAIKU - LIMERICK - ODE - ABC POEM - FREE VERSE - END RHYME - BLANK VERSE

Possible topics related to the theme include:

- Seaweed
- Micro- or macro- algae
- Photosynthesis
- Bioluminescent algae
- Algae as food & habitat for animals
- Consumer products from algae
- Oxygen from algae
- Biofuels from algae

Entries will be judged based upon:

- Artistic Merit - use of color, quality of drawing, design, and layout
- Poem Message - fun, motivational, inspiring about yearly theme
- Originality Creativity - unique, clever and/or creative design
- Neatness - free of spelling and grammatical errors

Contest rules:

- All poems must be no more than 40 words, and in one of the following styles to be considered: Haiku, Limerick, Ode, ABC poem, Free verse, End rhyme, and Blank verse.
- Entries are judged based upon relevance to and incorporation of the CCEW theme, word choice and imagery, colorful artwork, adherence to poem style, originality and creativity, and overall presentation.
- All entries must be original works without aid from others. Poems may be submitted by hand on an unlined sheet of paper not larger than 11" by 14" or scanned and sent via email. Illustrations may be created using crayons, watercolors, other types of paint, colored pencils, or markers. The illustration may also be electronically created by using a digital painting and drawing app on a computer, tablet, or mobile device.
- The text of the poem should be easy-to-read and may be typed before the hand-drawn or digital illustration is added, or the poem may be written on lined paper, which is cut out and pasted onto the unlined paper with the illustration.
- No clipart or unoriginal images can be used.
- Only one entry per student will be accepted; all entries must include an entry form.
- If the illustration is created using a digital painting or drawing app, the name of the program must be included on the entry form.
- Acceptance of prizes constitutes consent to use winners' first name and last initial, along with the name of the ACS Local Section, on the ACS web pages and in the magazine, Chemical & Engineering News

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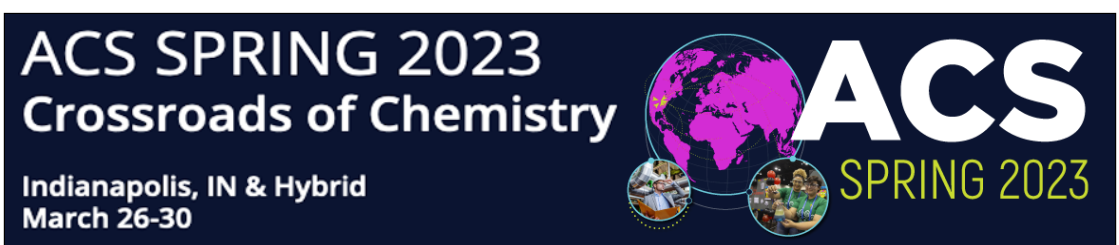
Although the antigen tests are very specific for the virus, they are not as sensitive as molecular PCR tests and cannot detect all of the active cases. It is worth mentioning that getting a negative result by the antigen test does not rule out the infection because of the high chance of a false-negative.

For the serological tests to work, the body needs to develop a detectable antibody level which takes 5–7 days. Serological tests cannot be used to diagnose acute or active COVID-19 infection. The performance characteristics of such tests are assessed based on their clinical sensitivity and specificity using a 95% confidence interval.

Nanotechnology plays a critical role in the advancement of the fabrication and manufacturing of miniaturized sensing technologies. The advancement in 2D- and 3D-based nanomaterials is shown to satisfy the increasing demand for diagnostic tests with improved sensing performance. The major advantage of nanomaterials is that they provide a superior surface area/volume ratio in comparison to their bulk counterparts, which offers more sensitivity for the detection of biological or chemical molecules even at the trace of a single-molecule level. At the nanoscale, materials attain several unique optical, plasmonic, and electrical properties. For all these reasons, over the years, nanomaterials played a major role to advance the field of medical diagnostics, environmental monitoring, and many other sensing applications while offering high accuracy and sensitivity. The example of these sensing technologies may span from wearable sensors, and point-of-care sensors, to implantable sensors. Nanotechnology-based biosensors exhibit high sensitivity, which allows the early detection and continuous monitoring of patient's health status in a personalized fashion. The use of nanotechnology in sensor design and fabrication tackles the current challenges in the diagnostic field in terms of scalability, mass-production, sensitivity, and multiplexing capability. For pandemic preparedness, a rapid response is highly anticipated.

(Reference: Maya Alafeef and Dipanjan Pan, Nano Materials 2022, 16, 11545-11576.)



ACS Spring 2023: Crossroads of Chemistry
Indianapolis, IN & Hybrid
March 26-30, 2023

ACS Meetings & Expositions are where chemistry professionals meet to share ideas and advance scientific and technical knowledge. By attracting thousands of chemical professionals, the meetings provide excellent opportunities for sharing your passion for chemistry, connecting with one of the world's largest scientific societies, and advancing your career in this ever-changing global economy.

Visit this site for more information and registration.
https://www.acs.org/meetings/acs-meetings/spring-2023.html

The ACS 27th Annual Green Chemistry & Engineering Conference June 12-15, 2023 Long Beach, CA & Hybrid

Theme: "Closing the Loop: Chemistry for a Sustainable Future"

The ACS Green Chemistry Institute's Green Chemistry & Engineering Conference is the premier conference for scientists, students and leaders seeking innovative and more sustainable ways to do chemistry and chemical engineering. The 27th Annual Green Chemistry & Engineering Conference will be a hybrid meeting held in-person in Long Beach, CA and streamed online for virtual participants.

This is a great opportunity for our Southern California Section members to attend this event in person for the best networking experience and to take part in the conference workshops and activities. If you can't travel, virtual access will allow you to participate in the robust technical program.

While a wide variety of green chemistry and engineering topics are covered in the technical program each year, the thematic focus on the stages of the chemical life cycle is intended to challenge the green chemistry and engineering communities to move toward a systems thinking approach that will help create a more sustainable future. Check out this year's program here: https://www.gcande.org/program/

Early Bird Registration is now open at: **https://www.gcande.org/register/**

There are many categories of registration that include free admissions. Scholarships to attend the virtual GC&E Conference are also available. Find out more at: **https://www.gcande.org/register/**

BY

KEITH ORSO
Irell & Manella LLP
KOrso@irell.com

Having addressed the topic of copyright infringement, now comes the doctrine of "fair use." Like the idea/expression dichotomy discussed in the April 2022 edition of this column, fair use is an accommodation to First Amendment freedoms.

The idea/expression dichotomy encourages others to use and build freely upon the ideas and information they find in copyright works. Fair use allows the public to use not only ideas and information in such works, but also expression itself in certain circumstances, as the Supreme Court has explained, without incurring liability for copyright infringement.

The fair-use doctrine is codified in the copyright statute, which states that notwithstanding the section that confers exclusive rights on authors, the "fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright."

The statute sets forth four factors that should be included in determining whether the use made of a work in any particular case is a "fair use":

(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;

(2) the nature of the copyrighted work;

(3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and

(4) the effect of the use upon the potential market for or value of the copyrighted work.

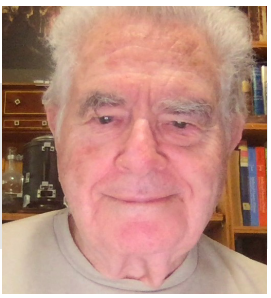
Does a work have to be published in order to be eligible for fair use? No. The statute specifically states that the fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all of the above factors. Future editions of this column will further explore the fair use factors, including how they apply in situations involving reproduction of copyrighted works by educators and librarians, for example.

The author earned engineering and chemical engineering undergraduate and graduate degrees, and is a patent attorney and partner at the law firm of Irell & Manella LLP. This column does not constitute legal advice and does not necessarily reflect the views of the firm or its clients.

THIS MONTH IN CHEMICAL HISTORY

BY

HAROLD GOLDWHITE
California State University, Los Angeles
hgoldwh@calstatela.edu



Here we are in 2023 and I am resuming my custom of looking back to the past through the medium of the "Annual Reports of the Progress of Chemistry" published in London by The Chemical Society. I joined The Chemical Society (now called the Royal Society of Chemistry; RSC to its friends) when I was a graduate student, and now am an Emeritus member. But I digress. The volume I have chosen to write on is the report for 1933, 90 years ago – and is Volume 30, the series having started in 1903.

In physical chemistry a great deal of experimental work has been carried out on tests of the Debye-Hueckel theory of the thermodynamics of electrolyte solutions, first proposed six years earlier. Experimental results on the solubilities of salts in electrolyte solutions are only in accord with the theory for one-to-one salts in one-to-one electrolyte solutions. For higher valency salts or electrolytes various adjustments of theory are proposed, with indifferent success.

"The hydrogen isotope of mass 2 has been the subject of a continually increasing volume of research during the year." Deuterium was quite a novelty in 1933 and was given its name in that year. Lord Rutherford dissented and proposed the alternate name of "diplogen" and the Report suggested, in true chauvinistic fashion, "Among British chemists 'diplogen' will find more favour. Fortunately, both alternatives lead to the symbol "D" for the new atom." We know which name won out.

Many methods for increasing the concentration of deuterium include refining the original method of distillation of liquid hydrogen. Other methods include electrolysis of water, adsorption of hydrogen on charcoal, distillation of water, adsorption of water on charcoal, reduction of water by hot iron, diffusion of hydrogen through palladium, and displacement of hydrogen in acids by zinc. G.N. Lewis has used the electrolysis method using an old electrolytic solution and has prepared 1.3 ml of pure D_2O.

The proportion of deuterium in hydrogen has been more accurately determined as 0.03% by mass. Water containing 0.5% of deuterium is available commercially. The physical properties of pure D_2O have been determined by Lewis and others. Its melting point is 3.8°C and its boiling point is 101.4°C. It has a density of 1.1056 g/ml – "heavy" water indeed.

Some early work on isotope effects in reactions are reported. When ammonium chloride is dissolved in D-enriched water the hydrogen atoms on the ammonium ion exchange with deuterium in the water very rapidly and at equilibrium the proportion of deuterium in the ammonium ions is the same as in the solvent. When sucrose is dissolved in D-enriched water only the hydroxylic hydrogens exchange; the C-H hydrogens remain unchanged. When hydrogen gas enriched in deuterium is stored over ordinary water for six weeks it loses over 95% of its deuterium content. The exchange is greatly accelerated in the presence of finely divided platinum. It is suggested that such exchanges proceed through an ionic mechanism. [Recall that even pure water does contain a very low concentration of both hydroxide and hydronium ions.]

(Continued on page 13)

CHAIR'S MESSAGE

Hello!

The San Gorgonio Section kicked off the new year with a **dinner for chemistry faculty** in the area. It was wonderful to get together with other professors in an informal setting to network, talk, laugh, and share stories. If you are a professor, we hope to see you at our next gathering later in the year!

This spring's theme for the San Gorgonio Section is Outreach. There will be a few opportunities to share with the community how amazing chemistry is.

In **March**, the Section will once again host the **Chemistry Olympiad** for high school students in the area. This event allows our members to help inspire a love for chemistry in local high school students. The local exam will follow a hybrid format, allowing students to take the written exam online or in person. The top-scoring students from the local exam will be invited to participate in the in-person national exam in **April**. The national exam involves a lab component that requires high school students to use their problem-solving skills. The Section will cover all costs for the high school students to participate, to ensure that chemistry is accessible for the next generation. In May, we will hold a banquet to recognize the top-scoring students and their teachers. Thank you to the members of the Chemistry Olympiad committee for your work to make the Olympiad a success year after year!

In March, our Community College & University Engagement committee will host an outreach event for college students. The event will offer community college students from a wide range of majors the opportunity to participate in various chemistry demos before attending a general interest talk by **Dr. Mahmood Nikbakhtzadeh from CSUSB.** His talk is focused on the field of environmental health and how 3 environmental

toxins - alcohol, tobacco, and nicotine - affect the body. The goal of this event is to instill an appreciation of STEM in these college students and introduce them to a possible career path. The event will be held on **Saturday, March 11, from 10 am to 1 pm at Norco College.** Check our website for more information. If you want to host a demo table, please email me. If you are a community college professor, can you help us by advertising this event to your students?

The San Gorgonio Section is now on LinkedIn! Connect with us on LinkedIn (San Gorgonio ACS), follow us on Instagram (@SanGorgonioACS), and bookmark our webpage (https://www.sangorgonioacs.com/) to stay up-to-date on the latest with the Section.

If you would like to volunteer for one of our committees, please fill out the form at https://forms.gle/26CZmwuWP1qjMWbc6. If you would like to become a financial partner of the Section, you can email me at jnalbandian@calbaptist.edu. We use donations from our members for funding student scholarships, Project SEED research for high school students, outreach events, and more!

Feel free to email me if you have any questions or suggestions for the Section. Have a great month!

Dr. Jenifer N. Nalbandian
Chair of the San Gorgonio Local Section
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Studies of reaction rates in heavy water have been initiated. In acidified water containing about 50% of deuterium the mutarotation of glucose is slowed to about half its value in ordinary water. G.N. Lewis has shown that tobacco plant seeds will not germinate in pure D_2O and the same liquid kills a variety of small organisms including protozoa and tadpoles. [No doubt the challenge of obtaining sufficient amount of D_2O prevented experiments on larger animals.]

Bernal and Fowler have proposed a "pseudo-crystalline" model for the structure of liquid water. Water II has a four-coordinate arrangement of molecules analogous to SiO_2 in quartz. Water I has the structure of ice. And Water III is close packed as in an ideal liquid. The proportions of the various forms vary with temperature. The model has useful applications to the properties of ionic solutions and is backed up to some extent by X-ray diffraction studies of liquid water.

Staying with hydrogen chemistry (and it is impressive how much challenging chemistry there is for this simplest of elements) the conversion of para- into ortho-H_2 is catalyzed by paramagnetic molecules such as NO, O_2, and N_2O_5. The interconversion is also accelerated in solution.

My review of this 90-year-old chemistry has only just scratched the surface – 40 pages out of over 400. You can look forward to a few more columns on this topic. Happy New Year.

SOUTHERN CALIFORNIA SECTION
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IMPORTANT
Do Not Delay!

Contains Dated Meeting Announcement

PERIODICALS

Bi-Section ACS Calendar

MARCH

11 Talk with Dr. Mahmood Nikbakhtzadeh from CSUSB — see page 12

15-16 High School Chemistry Olympiad Local Exam — see page 5, 12

26-30 ACS Spring 2023: Crossroads of Chemistry (IN & Hybrid) — see page 8

APRIL

1 City of STEM Science Festival & LA Maker Faire — see page 6

16-22 Chemists Celebrate Earth Week — see page 6

24 2023 CCEW Illustrated Poem Contest Deadline — see page 7

JUNE

12-15 ACS 27th Annual Green Chemistry & Engineering Conference, CA — see page 9

For more information or to find events, please see our websites:
www.scalacs.org • www.sangorgonioacs.com