ACS Chemistry for Life®

SCALACS

A Publication of the Southern California Section of the American Chemical Society

VOLUME LXXIX/No. 5 SEPTEMBER 2024

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Volume LXXIX SEPTEMBER 2024 Number 5

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NOTICE:
DISCONTINUING PRINT VERSION OF THE SCALACS MAGAZINE

Beginning **January 2025**, the *SCALACS Magazine* will be going 100% digital as the default delivery mode. *SCALACS Magazine* has been available in digital form since 2010, but we continued to send print issues to a subset of members. If you are currently receiving a printed version of the *SCALACS Magazine* and wish to continue receiving the SCALACS Magazine in this form, please e-mail **office@scalacs.org** by **November 15, 2024.**

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CHAIR'S MESSAGE

Hello everyone,

It's hard to believe that summer is almost over (this issue of SCALACS Magazine will be published right around the start of autumn)! If you haven't yet, you better hurry and take a summer holiday. As summer winds down, we find ourselves gearing up for the fall. Some of us are preparing for the next semester, some are excited to start classes, others are continuing their research, and some are moving into new roles (program management, retirement, administration, etc.). In this time of local, national, and global events and challenges, there is reflection on the past and hope for a better future.

I would like to congratulate a member of our SCALACS family: Thomas Mathew (University of Southern California) who was named a 2024 ACS Fellow for his research, teaching, and outreach to our community. He has served as Chair of the Fluorine Division for the ACS and is a past chair (twice!) for SCALACS.

I would also like to thank our Chair-Elect, Veronica Jaramillo, for stepping up and representing SCALACS and ACS in Southern California while I was on medical leave. She judged at the International Science & Engineering Fair (and organized the ACS Special Awards!) and attended the Tolman Award Dinner at UCLA honoring Professor Sarah Tolbert.

We are gearing up for our Fall 2024 Election. There will be elections for Member-at-Large of the Executive Committee and Councilor positions, as well as Chair-Elect. We invite our SCALACS members not only to participate in the voting but also to contest for these positions. After all, SCALACS is your Section and we are in dire need of new faces to bolster the efforts of current Executive Committee Members serving the community through various activities.

By the time this newsletter goes out, the ACS Fall 2024 meeting in Denver, CO, will have taken place – I hope some of our fellow SCALACS members were able to attend. The next ACS meeting (ACS Spring 2025) will be held in San Diego, California from March 23 to 27, practically next door to us!

Wishing everyone good health and a safe, drama-free Fall.

Take care,

Richard Kidd
Chair, SCALACS

International Chemistry Olympiad

Team USA Wins 3 Gold and 1 Silver Medals at the 2024 International Chemistry Olympiad

L-R: Yufei Chen, CA (gold medal and third place overall), Alice Liu, MO (gold medal), Anantshri Asthana, TX (silver medal), and Yunyi Ling, MD (gold medal). Photo credit: Steve Lantos

We are thrilled to announce that the four members of Team USA earned 1 silver and 3 gold medals at this year's International Chemistry Olympiad in Riyadh, Saudi Arabia.

Out of 327 participants, 202 were awarded gold, silver, or bronze medals.

The Team USA medalists are:

YUFEI CHEN
University High School, CA, Orange County Local Section, Gold medal, ranked third overall

ALICE LIU
Marquette High School, MO, St. Louis Local Section, Gold medal

ANANTSHRI ASTHANA
John Foster Dulles High School, TX, Greater Houston Local Section, Silver medal

YUNYI LING
Montgomery Blair High School, MD, Chemical Society of Washington, Gold medal

This year 84 countries, 5 observer countries, and 8 individual participants competed in the IChO.

We are immensely proud of the Team USA. Congratulations!

2024 ACS Fellows

Congratulations to Thomas Mathew who was inducted into the American Chemical Society (ACS) Fellows Class of 2024 at a ceremony during the ACS Fall Meeting in Denver, Colorado this past August.

Thomas, a senior scientist at the Loker Hydrocarbon Research Institute, University of Southern California, received this recognition for his research accomplishments as well as for his long-standing service to the ACS Community.

Starting as an ACS member in 1999, Thomas has been involved with our local leadership for about a decade in various capacities: Member-at-Large, Committee Chair, and Chair for 2021 and 2022. Thomas, a Humboldt Fellow of the1994 class and a Fellow of the Royal Society of Chemistry since 2013, also served as the Vice-Chair/ Secretary (2020-2022) and Chair of the ACS Division of Fluorine Chemistry (2023). He is the Chair for the upcoming 27th Winter Fluorine Conference of the ACS Fluorine Division, which will be held in Clearwater Beach, Florida, on January 5-10, 2025.

Thomas was instrumental in preparing proposals for SCALACS that led to the award of the Senior Chemists Committee grants in 2021 and 2022 for encouraging the Local Section Senior Chemists in various activities. He also supported DEIR among students and staff of academic and industrial institutions. He was responsible for arranging a virtual seminar by Nobel Laureate Arieh Warshel under the LSAC/DEIR grant which was attended by around 200 science teachers, students, and public at large. Most noteworthy are his efforts in Fall 2022 for planning and implementing the one-day undergraduate/graduate Research Symposium titled “The Red Planet and The Blue Planet: Past, Present and Future” on November 5, 2022. This was, in fact, the very first in-person audience attended event since the start of the Covid-19 crisis that paralyzed all such activities.

The ACS Fellows Program was created by the ACS Board of Directors in December 2008 to recognize members of the ACS for outstanding achievements in and contributions to science, the profession and the Society.

Scenes from SCALACS 2022 Undergraduate/Graduate Research Symposium. Thomas Mathew at the podium.

Thomas Mathew (2nd from L) at the 2022 Undergraduate/Graduate Research Symposium.

ACS FALL 2024 MEETING
August 18 - 22, 2024 • Denver

Summary of ACS Council Governance Actions

The ACS Fall 2024 was held from August 18 – 22, 2024 in Denver Colorado. As of August 22, there were 11,569 registrations (10,245 in-person and 1,324 online).

At its meeting on August 21, the ACS Council elected members for a 2025-2027 term to the Council Policy Committee, the Committee on Committees, and Nominations and Elections. Other key council actions and report highlights included the following:

1. Approved the Petition for Global Representation on Council. This petition allows for the creation of Global Electoral Zones for the election of Councilors by ACS members living outside the territory of existing Local Sections.

2. Approved the Petition to Amend the Name of the Committee on Technician Affairs (CTA) to the Committee on Chemical Technical Professionals (CTP). This change recognizes the fact that the term “technician” does not adequately reflect the variety of titles used for these positions across the broader chemical enterprise.

3. Approved the continuance of the Committees on Ethics; Nomenclature, Terminology and Symbols; and Project SEED and, subject to the concurrence by the ACS Board of Directors, the Committees on Chemical Safety; Chemistry and Public Affairs; Community Activities; Minority Affairs; Professional Training; Science; Senior Chemists; Women Chemists; and Younger Chemists.

4. Approved the Academic Professional Guidelines, as amended to reflect the shared responsibility and accountability with the academic institution, faculty, and other mentors in creating a safe environment, and the Chemical Professional’s Code of Conduct.

   Councilors marking a five-year anniversary of service on Council were acknowledged; these included Southern California councilors Robert de Groot (15 years) and Eleanor Siebert (30 years). Councilors attending meetings of their committees included Brian Brady (Membership Affairs), Veronica Jaramillo (Community Activities), and Eleanor Siebert (Constitution and Bylaws).

For full text, visit SCALACS website: https://scalacs.org/?page_id=44

Photo credit: Manju Venugopal

Carl Heltzel (L) and Anna Wilson (R), ACS Senior Chemists Committee members manning SCALACS booth at the ACS Fall 2024 Meeting.

Congratulations to Professor Sarah Tolbert, the recipient of the 2023 Tolman Award in recognition of her scientific contributions in nanoscience and materials chemistry.

Professor Tolbert (L) received the Tolman Award from Dr. Veronica Jaramillo (R), Chair Elect of SCALACS.

Prof. Spokoyny made the opening remarks.

Congratulatory remarks from Dr. Veronica Jaramillo.

Prof. Tolbert gave her research presentation.

On June 12, 2024, Professor Sarah Tolbert was awarded the American Chemical Society Southern California Section's highest honor, the Richard C. Tolman Award Medal, in recognition of her groundbreaking research in nanoscience and materials chemistry.

Faculty, students, alumni, and staff attended the Tolman Award dinner at the UCLA Faculty Club. Professor Alexander Spokoyny, Chair of the UCLA Department of Chemistry and Biochemistry, gave welcoming remarks and introduced Professor Tolbert. The Tolman Award was presented to Professor Tolbert by SCALACS Chair-Elect, Dr. Veronica Jaramillo.

Professor Tolbert then gave a research presentation. In her address, she discussed her many collaborative research projects at UCLA and provided more details on her work on fast-charging batteries.

We thank Professor Spokoyny and Isaiah Gutierrez, UCLA Seminar and Event Coordinator, for organizing this wonderful celebration.

Current and former members of the Tolbert group.

Photos by Penny Jennings, UCLA Department of Chemistry & Biochemistry

2024 Regeneron ISEF Event Summary

The Science Society's International Science and Engineering Fair (ISEF), the world's largest international pre-college STEM research competition, was held in Los Angeles May 13-16. Sponsored by Regeneron, the ISEF provides a platform for the best and brightest high school seniors to showcase their science, technology, engineering, or math research. This year, nearly 2,000 finalists from almost 70 countries, regions and territories competed for more than $9 million in awards and scholarships. Those finalists earned the opportunity to compete at Regeneron ISEF by doing well in their local science fair. Society for Science has a network of more than 400 regional, state and country science fairs around the world, and each year, over 175,000 students compete in those fairs with the goal of participating in Regeneron ISEF.

Through its participation in Regeneron ISEF, ACS encourages and supports high school students in their exploration of the chemical sciences through research experiences.

SCALACS took the lead in arranging the judging for the Special Awards sponsored by ACS. We would like to thank the judges: Dean Veronica Jaramillo (PCC), Professor Jessica Parr (USC), and Professor Ellen Harju (PCC). They reviewed 38 Biochemistry Poster and 70 Chemistry Posters. The winners were determined after interviewing students on May 15th. Below is the list of the winners chosen.

ISET 2024. Photo courtesy of Society for Science/Lisa Fryklund.

AMERICAN CHEMICAL SOCIETY

First Award of $4,000

BCHM018 — *Human Milk Immune Complexes Isolated Following Pregnancies Complicated by COVID-19 Infection Contain SARS-CoV-2 Nsp13 Helicase and Biologically Active Factors*
• Vaishnavi Kolluru, Dougherty Valley High School, San Ramon, CA, USA

Second Award of $3,000

CHEM012 — Chemical Modification of Acetaminophen to Decrease Liver Toxicity
• Chloe Yehwon Lee, Plano East Senior High School, Murphy, TX, USA

Third Award of $2,000

CHEM035 — Novel TMOS-Dependent Synthesis of Water-Stable CsPbBr3-SiO2 Nanoparticles for Bioimaging Applications
• Katherine Lam, University High School, Tucson, AZ, USA

Fourth Award of $1,000

CHEM036 — *Synergistic Development of Perovskite Oxide Electrocatalysts Through Metal-Organic Framework Precursors for Energy Conversion Applications*
• Abeer Ali Alyousef, Dohat Alibdaa International Schools, Alahsa, Eastern Province, Saudi Arabia

(Continued on page 7)

SCALACS Presentation at National LSAC Webinar

The Local Section Activities Committee of the American Chemical Society (LSAC) organized a nationwide webinar on July 17, 2024 to highlight the various grants available to local sections (LSAC DEIR/IPG/MEET/Science Café).

The purpose of this webinar is to encourage all sections to submit proposals and conduct activities benefiting all of the population. LSAC invited three local sections who submitted successful grant proposals to explain to the audiences how they planned their events/activities and implemented them. These were the Indiana, New York and Southern California sections. The focus was on social events, member recognition/awards, public outreach and education.

The Indiana section was represented by Abdallah Diagne, the New York Section by Brian Gibney and the Southern California Section by Krishna Kallury. Dr. Diagne spoke about planning ahead, staying organized, optimizing events to fit grants and involving all local section members including the chair. Dr. Gibney described the events NYACS carried out under various grants received by their section and also mentioned collaborative efforts with SCALACS.

Dr. Kallury emphasized following the LSAC guidelines in formulating a successful proposal, but always with a focus on the vision/mission of the local section. He proceeded to describe the demographics of SCALACS area and how proposals are fashioned to address their needs. He then described the events that were organized to promote STEM education/research at the high school and undergraduate level utilizing the LSAC/MEET and DEIR grants. He also described collaborative efforts with the NYACS and the Nigerian affiliate of ACS in promotion of African American and Hispanic heritage under the LSAC/DEIR grant.

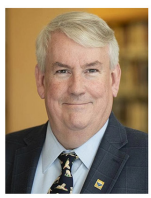
Meruvia Williams of LSAC who coordinated the event wrote, “Thanks for your wonderful insights and the information presented will be extremely useful for many local sections.”

For full details on the event please visit https://scalacs.org/?page_id=3194 and click on the link to the presentation slides and commentary.

Krishna Kallury
Alternate Councilor, SCALACS

Graeme Wyllie Ph.D.
Red River Local Section

Abdallah Diagne Ph.D.
Indiana Local Section



Brian Gibney Ph.D.
New York Local Section

Krishna Kallury Ph.D.
Southern California Local Section

(Continued from page 6)

Diploma of Recognition and $100 Gift Card

BCHM033 — *The Effect of Liposomes on Drug Delivery of Ascorbic Acid*
• Thien-Nhi Allison Nguyen, West Shore Junior/Senior High School, Melbourne, FL, USA

CHEM046T — *Dyes Adsorption Using Activated Carbon From Coffee Capsule Grounds*
• Alana Carolina da Costa Franca, Instituto Federal da Bahia (IFBA) – Campus Camacari, Dias d’Avila, Bahia, Brazil
• Caio Nunes Santana, Instituto Federal da Bahia (IFBA) – Campus Camacari, Camacari, Bahia, Brazil
• Emily Kanashiro da Hora, Instituto Federal da Bahia (IFBA) – Campus Camacari, Camacari, Bahia, Brazil

CHEM058 — *Synthesis and Evaluation of a Low-Cost Biopolymer Encapsulant for Lead Sequestration in Halide Perovskite Solar Cells*
• Abhinav Venkata Meduri, North Carolina School of Science and Mathematics, Cary, NC, USA

CHEM068 — *Optimizing Synthesis of mRNA Therapeutics*
• Srijay Sritaharan Chenna, The Charter School of Wilmington, Newark, DE, USA

You can find more information on this event on the Society for Science website: https://www.societyforscience.org/isef/

Join us on Friday, Sep. 27 from 2:00 to 4:00 PM for a virtual seminar on Climate Change hosted by SCALACS and supported by the ACS LSAC Innovative Project Grant (IPG).

We are honored to feature two esteemed professors, each delivering a one-hour presentation on key topics related to climate change.

Stories from STEM – Know Your Power
Time: 2:00 - 3:00 PM
Presented by Professor Doris Lewis
Professor Emerita of Chemistry, Suffolk University

Abstract:
STEM courses can be challenging for both students and teachers, but the rewards are well worth the effort. An understanding of climate change chemistry is easily accessible through basic chemical equations and can provide the basis for meaningful actions. You are not alone in this journey; the American Chemical Society can support you with resources and lifelong opportunities for career networking and influencing public policy. Stories from a career in STEM may inspire you to persevere and perhaps to tell your own story.

About the Speaker:
Doris Lewis hails from West Virginia. She received her Bachelor's degree from Duke University and Ph.D. from Tufts University.

Dr. Lewis's own story involved growing up in West Virginia, the experiences and influences that propelled her into pursuing a professional career in chemistry, and the challenges of being a woman in the field of chemistry. She began her career at Suffolk University in Boston where she served as department chair. Her many contributions to the department over 37 years include the founding of the Forensic Science program, interdisciplinary collaborations with Suffolk's MBA program, and creating a popular series of courses related to food and nutrition. Another notable contribution was her role in establishing an award-winning Suffolk University student chapter of the American Chemical Society which provided many professional development opportunities to her students.

Dr. Lewis is also the recipient of the E. Ann Nalley Award for Volunteer Service to the American Chemical Society and James Flack Norris Award for Service to the Northeastern Section (NESACS) and the Profession of Chemistry.

Dr. Lewis is Chair of the NESACS Government Relations Committee. Past NESACS activities include being NESACS Chair (2000) and ACS Councilor. She is Professor Emerita of Chemistry at Suffolk University and an ACS Fellow. She is currently associate member of the ACS Committee on Technician Affairs.

Towards Electrification of the Chemical Industry
Time: 3:00 - 4:00 PM
Presented by Dr. Shelley Minteer

Professor, Dept. of Chemistry & Director of the
Kummer Institute Center for Resource Sustainability,
Missouri University of Science and Technology

Abstract:
In the last 5+ years, there has been a focus on improving the sustainability and decarbonization of the chemical industry via electrosynthesis. However, electrochemical approaches have been challenged by poor reaction selectivity. This talk will discuss using biocatalysts as electrocatalysts to address this selectivity issue, including both mediated enzymatic bioelectrocatalysis and direct enzymatic bioelectrocatalysis. The talk will discuss electrode materials innovation for interfacing complex proteins with electrode surfaces as well as using them for electrosynthesis of ammonia and other value-added products (i.e. chiral amines, chiral imines, polymers, etc.). There will be a focus on sustainability in the chemical industry.

About the Speaker:
Dr. Shelley Minteer is a Professor of Chemistry and the Director of the Kummer Institute Center for Resource Sustainability at Missouri University of Science and Technology. She is also the Director of the NSF Center for Synthetic Organic Electrochemistry.

She received her Ph.D. in Analytical Chemistry at the University of Iowa in 2000 under the direction of Professor Johna Leddy. After receiving her Ph.D., she spent 11 years as a faculty in the Department of Chemistry at Saint Louis University before moving to the University of Utah in 2011 to lead the USTAR Alternative Energy Cluster. She was a Technical Editor for the Journal of the Electrochemical Society (2013-2016) and also an Associate Editor for the Journal of the American Chemical Society (2016-2020) before becoming the inaugural Editor-in-Chief of the ACS Au Journals. She has published more than 450 publications and made more than 550 presentations at national and international conferences and universities.

She has won several awards including the Luigi Galvani Prize of the Bioelectrochemical Society, International Society of Electrochemistry Tajima Prize and Bioelectrochemistry Prize, Grahame Award of the Electrochemical Society, Fellow of the Electrochemical Society and the International Society of Electrochemistry, American Chemical Society Division of Analytical Chemistry Award in Electrochemistry, and the Society of Electroanalytical Chemists' Young Investigator Award and Reilley Award. Her research interests are focused on electrocatalysis and bioanalytical electrochemistry. She has expertise in biosensors, biofuel cells, electrosynthesis, and bioelectronics.

This is a free virtual seminar open to everyone. Please register to save your spot. You will receive a Zoom link prior to the event. Registration is open now at https://tinyurl.com/479cd8v9 or visit our website at scalacs.org.

SCALACS is proud to host a virtual Research Symposium for High School Students, made possible by the ACS LSAC-Innovative Projects Grant. This event offers a glimpse of what STEM research is about to students aspiring to become leaders in future innovations. Award winners at the 2024 ISEF will join local students in describing how their research projects were planned, executed in the lab, how their collected data were analyzed, and how resulting conclusions supplement current knowhow in solving real-world problems. Students are invited to choose any STEM-related topic and deliver a 15-minute presentation via Zoom. Teachers, please encourage your students to participate—this judged event will award $100 gift certificates to the top 10 presenters!

HIGH SCHOOL STUDENTS RESEARCH SYMPOSIUM

ACS Local Section
Southern California

Date: **Sat., November 2nd, 2024**
Time: **Morning session: 9 am - 12 noon PT**
Afternoon session: 1:00 - 4:00 pm PT
Topic: **Any topics area related to STEM**
Duration/Mode of Presentation: **15 minutes/Powerpoint via Zoom**

To **PARTICIPATE as a presenter,** email your name, school & presentation title to **office@scalacs.org.**
Presentation Submission closes: **September 7**

To **ATTEND,** please RSVP online at **www.scalacs.org.**
Attendee Registration closes: **October 31**

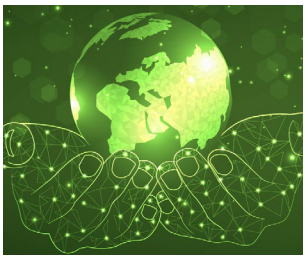
Contact **office@scalacs.org** for questions.

Presentations will be judged and the top ten presenters will be awarded a $100 gift certificate each.

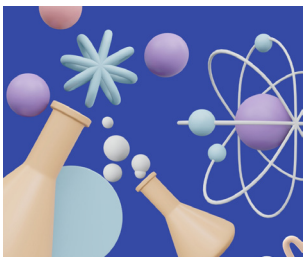
To present, email:
office@scalacs.org

To attend, register at:
scalacs.org

UPCOMING EVENTS

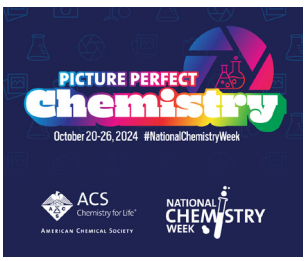


September 27, 2024, 2:00 - 4:00 PM
Symposium on Climate Change
Featuring two esteemed professors with presentation on Climate Change supported by the ACS LSAC-Innovative Projects Grant (IPG). Register at https://tinyurl.com/479cd8v9 or visit our website at scalacs.org.



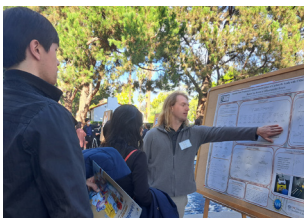
October, 2024
High School Science Fair
To support science teachers in local schools, SCALACS will be organizing a Science Fair at a high school in Torrance, CA. This event is made possible under the recently awarded Senior Chemists Committee DEIR Mini Grant.

October 3, 2024, 2:00 - 4:00 PM
National Hispanic Heritage Month Celebration
Featuring a free virtual seminar with presentations by two esteemed professors supported by the under the ACS LSAC-DEIR Grant. Stay tuned for more info.



October 20-26, 2024
National Chemistry Week 2024
Topic: Photography and Imaging
Theme: Picture Perfect Chemistry
Visit the ACS website for more information and resources: https://www.acs.org/education/outreach/ncw.html

November 2, 2024, 9:00 AM - 4:00 PM
High School Students Research Symposium
A virtual Research Symposium event for high school students hosted under ACS LSAC-Innovative Projects Grant (IPG). Interested to participate, email office@scalacs.org. To attend, register now at scalacs.org.



November 2024
Undergraduate Research Symposium
In celebration of National Chemistry Week, SCALACS will also organize an undergraduate research symposium in collaboration with local universities under the ACS LSAC-IPG.

More information will be announced in the next issue of SCALACS magazine.

BY

KEITH ORSO
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KOrso@irell.com

Beginning with the January 2022 issue, this column temporarily shifted focus from patent-related topics to copyright issues in response to a question from a reader. The focus now shifts back to patent law, though if readers have further questions about copyright law, please feel free to email them.

Suppose someone files a patent application in the United States Patent and Trademark Office claiming a new chemical compound. The applicant convinces the Patent Office to issue a patent specifically claiming the compound. What stops the applicant from obtaining another patent specifically claiming the very same compound? The answer is the doctrine of double-patenting.

There are two types of double patenting. The first type is called "statutory double patenting." Based on the name, one would expect to find a "double patenting" statute in the Patent Act. But there is no double-patenting statute per se. The statutory basis for statutory double-patenting is Section 101 of the Patent Act, which states that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." The word "a patent" in the statute is interpreted strictly to allow only one patent per invention. Thus, statutory double patenting prohibits two patents on the same invention.

Identifying statutory double patenting is easy if the claims of two patents, or a patent and an application, are identical. But claims can use different words to describe the same invention. For example, as one case has noted: "a claim reciting a length of 'thirty-six inches' defines the same invention as a claim reciting a length of 'three feet,' if all other limitations are identical." The case notes that "[a] good test, and probably the only objective test, for 'same invention,' is whether one of the claims could be literally infringed without literally infringing the other." If so, then the claims do not define the same invention and there is no statutory double patenting. Accordingly, an invention defined by a claim reciting a "halogen" is not the same as an invention defined by a claim that is identical in all respects except it recites "fluorine" instead of "halogen." The former claim can literally be infringed by a chlorine-containing compound without infringement of the latter claim requiring fluorine.

If neither claim can literally be infringed without literally infringing the other, then the claims define the same invention and the latter-issued claim is invalid for statutory double patenting.

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.

BY

HAROLD GOLDWHITE
California State University, Los Angeles
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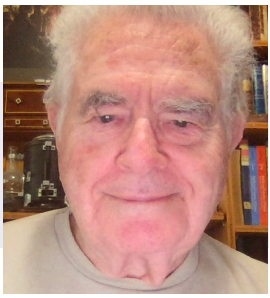

This month's column returns to a subject I often cover, namely "Great Chemistry Books." The work in question is a 1960 volume: "An Introduction to Transition-Metal Chemistry: Ligand-Field Chemistry" by Leslie E. Orgel, who at that time was an Assistant Director of Research at Cambridge University (my alma mater). In my undergraduate years (1950 – 1953), I had a number of lecturers in the inorganic chemistry courses. They presented a wide range of facts and theories, but the coordination chemistry of the transition metals was something of a puzzle. The theory did not go much beyond the ideas of Werner which were then a half century old.

I did not encounter the new ideas of ligand-field theory until I began to get involved in teaching inorganic chemistry at the University of Manchester Institute of Science and Technology in 1958. Orgel's book came along at just the right time to put a coherent structure on ideas I had sometimes been struggling with in preparing my lectures.

The book is a slim volume of 180 pages and is non-mathematical. Its premise is "the approximation by which we regard a transition-metal compound as made up of individual metal atoms or ions, perturbed by their immediate environment, but interacting only weakly with each other." Consequently the scope includes complexes of the transition metals but excludes alloys, and interstitial carbides and nitrides. An initial chapter covers the preliminaries of ionization energies of the metals; ligands; the definition of "stability"; and the fundamental concepts of coordination number and valency. The second chapter is a clear explanation of orbitals, especially the d-orbitals, and their energies. It includes the electrostatic crystal-field theory developed by Bethe and Van Vleck that completely (and deliberately) ignores covalent bonding. It then explains how in an octahedral environment of nearest neighbor ions or oriented dipoles the five d-orbitals split into two groups of different energies labelled as three t_{2g} and two e_g orbitals. A further section goes into molecular orbital theory, and that, of course, explicitly includes covalent bonding.

Chapter 3 is the heart of the matter considering ions with several d electrons and how they are distributed among the d orbitals with resultant magnetic and spectroscopic effects. The agreement or otherwise of the predictions of ligand-field theory with experimental results gives strong support for the theory in most cases. The treatment covers not only octahedral complexes but also tetrahedral and square planar complexes. Stereochemistry cannot be neglected in any discussion of transition-metal compounds; that subject was crucial to Werner's Nobel Prize work in the early 20th century. The subject is covered in Chapter 4 of Orgel's text. Refinements include the Jahn-Teller effect, planar low-spin d^8 complexes, and distorted tetrahedral complexes. Chapter 6 includes a detailed discussion of energy-level diagrams and electronic spectra.

Later chapters include discussions of reaction rates and mechanisms; covalent versus ionic bonding; low valency complexes; complexes of unsaturated hydrocarbons (historical note: the first such complex was discovered by Zeise in the early 19th. Century but was not characterized for 100 years); and the highest valencies of the transition metals.

Orgel's text was a clear and thorough exposition of the most modern views (in 1960) of the structures, and physical and chemical properties of transition-metal complexes. It was a true breakthrough in the teaching of the subject. It deserves recognition as a great chemistry book of the twentieth century.

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IMPORTANT
Do Not Delay!

Contains Dated Meeting Announcement

PERIODICALS

ATTENTION SCALACS MEMBERS!

Beginning January 2025, the *SCALACS Magazine* will be going 100% digital as the default delivery mode. *SCALACS Magazine* has been available in digital form since 2010, but we continued to send print issues to a subset of members. If you are currently receiving a printed version of the *SCALACS Magazine* and wish to continue receiving the SCALACS Magazine in this form, please e-mail **office@scalacs.org** by **November 15, 2024.**

LOOK OUT FOR THESE UPCOMING SCALACS EVENTS

SEPTEMBER

- Symposium on Climate Change, **Sep. 27**

OCTOBER

- Science Fair at a high school in Torrance in support of the local school science teachers
- A virtual event celebrating the National Hispanic Heritage Month, **Oct. 3**
- National Chemistry Week, **Oct. 20-26**

NOVEMBER

- High School Students Research Symposium, **Nov. 2**
- Undergraduate Symposium in collaboration with local universities celebrating National Chemistry Week

More details will be announced soon.

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