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## MESSAGE FROM THE PRESIDENT

**We make it!**

After years of planning, hard work, trials and tribulations, we make it! We have just successfully organised **IUPAC 2025** comprising the IUPAC 53rd General Assembly (53GA) and 50th World Chemistry Congress (50WCC) in Kuala Lumpur, Malaysia from 12 – 19th July 2025.

**IUPAC 2025** – It all started at the 50th IUPAC General Assembly in Paris, France in 2019. As soon as after winning the bid, we started work with the theme of “**Chemistry for Sustainable Future**” and the website: [iupac2025.org](http://iupac2025.org). Then come the programme and invited Plenary, Keynote and Invited Lectures, marketing and promotion to get the

delegates and the physical set-up and logistics to finally get it done at the Kuala Lumpur Convention (KLCC) from 12 – 19th July 2025.

The **53rd IUPAC General Assembly (53GA)** went on smoothly and seamlessly from 12 – 16th July with close to 500 people participating. **53GA** comprised a number of IUPAC events including Divisions and Committee Meetings, Science Board & Executive Board Meetings, World Chemistry Leadership Meeting (WCLM) and Council Meetings. It also included a Town Hall Meeting, a Soong Prize for Sustainable Chemistry Lecture by Professor Omar M Yaghi, Presidents’ Forum and the International Young Chemists Meeting (IYCM) programme.

The **50th World Chemistry Congress (50WCC)**, on the other hand, attracted more than 2,000 delegates taking part and 1,330 presentations. It was held from 14 – 19th July with the Opening Ceremony on 14th July followed by the Welcome Reception. For **50WCC**, we have three Clusters of scientific sessions comprising I) Pure & Applied Chemistry, II) Chemistry & SDGs and III) Thematic Sessions. These Sessions are managed by IUPAC Divisions & Committees, IKM and other Collaborating Organisations. It went on well and received excellent reviews.

The **IUPAC 2025 Congress Gala Dinner** was held on 16th July at the Shangri-La Hotel. Close to 800 invited guests attended this spectacular event with sumptuous foods served and exciting entertainment programme.

All information on the **53GA & 50WCC** are available on the website, [iupac2025.org](http://iupac2025.org). An **IUPAC 2025 Report** is also available online. All in all, IUPAC 2025 attracted 3,473 participants with 2,494 overseas delegates from 95 countries and 943 locals.

We have received excellent comments from the **IUPAC 2025** delegates including principal office-bearers of IUPAC. It is no doubt that **IUPAC 2025** is a great success.

Moving on, we are organising the **51st IUPAC World Polymer Congress (MACRO)** in Kuching, Sarawak, Malaysia from 28 – 31st July 2026 at the Borneo Convention Centre Kuching (BCKK). This will be followed by the **21st Asian Chemical Congress (21ACC)** in Kuala Lumpur in 2027.

IKM will continue to strive for excellence in these global meetings. This can only happen with the support of our members and chemists from all over the world.

Thank you and God blessed.

**Datuk ChM Dr Soon Ting Kueh**  
President, Institut Kimia Malaysia  
Date: 1st September 2025

## 10th NICE Conference 2025 in Yamagata, Japan

After the remarkable achievement and appreciation received from organizing IUPAC 2025, Institut Kimia Malaysia (IKM), which had previously organized the 9th Network of Inter-Asian Chemistry Educators (9NICE) Conference in Kuching, Sarawak, extended its presence to Yamagata, Japan for the 10th Network of Inter-Asian Chemistry Educators (NICE) Conference 2025, held from 25 to 28 July 2025. This year's conference carried the theme "Chemistry for STEAM, SDGs, and Inquiry-Based Learning" and welcomed 121 participants from Japan, Korea, Taiwan, Australia, and Malaysia, including university academics, undergraduates, teachers from elementary to high schools, and even high school students. The conference program explored a wide range of topics, from STEAM education and generative AI to inquiry-based learning and teacher training. Highlights included keynote lectures by representatives from various countries, as well as 27 oral presentations, 20 poster presentations, and 19 student-led presentations.

The IKM delegation was led by Datuk Dr. Soon Ting Kueh, accompanied by Prof. Dr. Sim Siong Fong (UNIMAS); Prof. Dr. Mageswary Karpudewan (USM), Datin Dr. Ng Soo Boon (SEGi University), Asst. Prof. Dr. Yvonne Choo Shuen Lann (Xiamen University Malaysia), and Dr. Suziyana Hashim, an experienced and highly recognized chemistry teacher. This diverse team of chemistry educators—representing different academic and professional levels—stood as the official delegates of Malaysia. On 25 July, the Malaysian delegation took a tour of the Yamagata prefecture and the surrounding areas including Yamadera, the Okama crater and kaminoyama.

The 10th NICE Conference commenced on 26 July with participant registration, followed by a welcome reception at the Yamagata Kokusai Hotel in the evening. On the following day, 26 July, the sessions began with a welcome address by the organizer, Prof. Dr. Yasunao Kuriyama from Yamagata University.

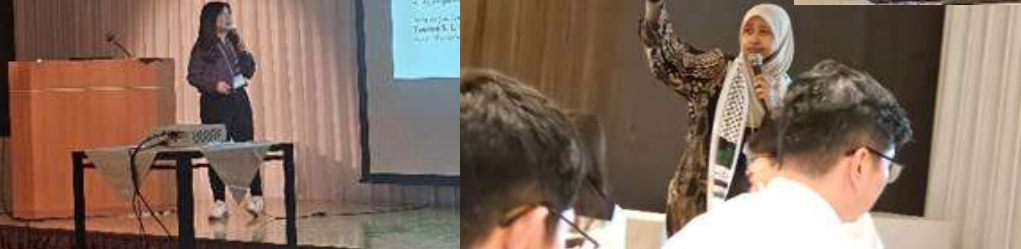
The welcome note was followed by the first keynote address delivered by Prof. Dr. Mageswary Karpudewan, titled "Changing the Trajectory of Chemistry Education Through Green Sustainable Chemistry." The session was chaired by Datuk Dr. Soon Ting Kueh. Subsequently, Prof. Dr. Sim Siong Fong showcased her presentation on "Enhancing Inclusive and Equitable STEM Education in Rural Schools – A Portable Chemistry Laboratory Kit." This was followed by Dr. Yvonne, who demonstrated the use of board games in teaching chemistry through her talk "From Intimidation to Interaction: Making Chemical Safety Relatable through Board Games." Finally, Dr. Suziyana Hashim presented on gesture-based teaching in her session titled "Enhancing Science Learning Through Gesture-Based Teaching." Photo 3 below captures the presenters in action.

As part of the conference program on the 27th, we toured two cultural sites—Jion-ji Temple and participated in the Safflower Dyeing Experience. Jion-ji, a prominent Buddhist temple located in Sagae, Yamagata Prefecture, offered insights into the early spread of Buddhism from South Korea to Japan. The safflower workshop provided us with a hands-on experience of extracting the red pigment from the flower (Photo 4). Remarkably, this pigment can only be obtained from about 1% of each flower, making it extremely valuable. Historically, during the safflower trading era, the pigment was said to be 100 times more expensive than rice and 10 times more expensive than gold.

After the closing ceremony on the 28th (Photo 5), conference delegates were given the opportunity to visit







Yamagata Nishi High School. The school visit provided us with valuable insights into the teaching of chemistry and science in Japan. We were introduced to the school's well-equipped laboratory facilities as well as the diverse teaching and learning methods practiced there. The conference concluded with this enriching school visit, which highlighted Japan's commitment to advancing science education. The 10th NICE in Yamagata, Japan, provided an excellent platform for exchanging ideas and best practices in chemistry education across Asia and beyond. Looking forward to the next 11NICE conference in Melbourne, Australia, in 2027!





## IUPAC 2025: 53rd IUPAC General Assembly (53GA) and the 50th World Chemistry Congress(50WCC)

The 50th World Chemistry Congress (50WCC) and the 53rd IUPAC General Assembly (53GA) were successfully held at the Kuala Lumpur Convention Centre, Malaysia, marking the first time these flagship IUPAC events were hosted in an ASEAN country. The gathering drew over 3,000 delegates from across the globe (95 countries), reflecting the strong international stature of the congress. The 53rd General Assembly took place from 12th – 16th July 2025, followed by the 50th World Chemistry Congress from 14th – 19th July 2025.

Organised by the International Union of Pure and Applied Chemistry (IUPAC) and Institut Kimia Malaysia (IKM), the congress was themed “*Chemistry for Sustainable Future*”, underscoring the pivotal role of chemistry in addressing global sustainability challenges. The scientific programme offered a dynamic mix of plenary and keynote lectures, oral presentations, poster sessions, working group meetings, and special forums. Delegates participated in thematic symposia centred on the United Nations Sustainable Development Goals (SDGs), including Zero Hunger, Good Health, Gender Equality, Clean Water, Affordable and Clean Energy, and Climate Action. These sessions featured leading experts from around the world, fostering knowledge exchange on emerging technologies, ethics in science, chemical safety, and professional responsibility.

Highlights of the event included the PhosAgro/UNESCO/IUPAC/IKM Lecture on green chemistry, delivered by Professor Paul Anastas, well-known father of green chemistry; workshops on chemical security, enrichment programmes for young chemists, and open forums for knowledge dissemination. The congress also celebrated scientific excellence through prestigious awards, such as the IUPAC-Soong Prize for Sustainable Chemistry and the Chemistry Europe Awards Lecture, delivered by Professor Stefan Grimme. Plenary lectures spanned diverse topics,

from AI in drug discovery and nanomaterial design to biosensors for resource-limited settings, quantum information in chemical systems, innovations in fluorine chemistry, and single-atom catalysis.

The General Assembly featured statutory meetings of the IUPAC Council, Divisions, Standing Committees, and executive bodies, alongside networking events such as the World Chemistry Leadership Meeting (WCLM), Town Hall session, leadership forums, and a joint opening ceremony with the congress that included a prize presentation and welcome reception.

Beyond the scientific sessions, delegates were treated to a vibrant array of social and cultural activities that showcased Malaysia's unique heritage. The Welcome Reception, held at the Kuala Lumpur Convention Centre, offered participants the chance to network while enjoying traditional Malaysian cuisine and cultural showcases. The Gala Dinner, held at the Shangri-la Hotel Kuala Lumpur, was a memorable evening filled with Malaysian Chinese cuisines, live entertainment, and opportunities for international delegates to connect in a relaxed setting and beautiful Malaysian Traditional performances.

### 53RD IUPAC GENERAL ASSEMBLY (53GA) 12TH – 16TH JULY 2025

The 53rd IUPAC General Assembly (53GA) was held from 12–16 July 2025 at the Kuala Lumpur Convention Centre,







Malaysia, in conjunction with the 50th World Chemistry Congress (50WCC). As the governing body's biennial gathering, the General Assembly brought together IUPAC's leadership, division members, standing committees, and national representatives from across the globe to review progress, discuss strategic priorities, and make key decisions guiding the Union's future. The assembly featured statutory meetings, open forums, and collaborative workshops, providing a platform for scientific governance, policy discussions, and the exchange of ideas between member organizations. The Highlights included the Council Session, where important resolutions were adopted, and the Committee and Division meetings, which advanced projects on nomenclature, chemical data standards, education, and public engagement. A Town Hall session fostered dialogue between IUPAC leadership and the broader chemistry community, ensuring transparency and inclusivity in decision-making. The World Chemistry Leadership Meeting bringing together experts from diverse chemical disciplines and cultural backgrounds, the 53GA reinforced IUPAC's mission to provide objective scientific expertise and foster global collaboration in chemistry, all while aligning its initiatives with the United Nations Sustainable Development Goals (SDGs).

## IUPAC POSTER PRESENTATION

A comprehensive showcase of the innovative works, achievements, and ongoing progress across each IUPAC Division. This presentation highlights the diverse research initiatives, collaborative projects, and scientific contributions that continue to advance the mission of IUPAC in promoting global chemistry excellence.

## 50TH WORLD CHEMISTRY CONGRESS (50WCC) 14TH – 19TH JULY 2025

### THE OPENING CEREMONY

The Opening Ceremony commenced with a Welcome Speech by Prof Ehud Keinan, President, International Union of Pure and Applied Chemistry (IUPAC). Datuk ChM Dr. Soon Ting Kueh, Organising Chairperson of IUPAC 2025 and President of the Institut Kimia Malaysia (IKM) presented an Opening Speech. In his speech, Datuk ChM Dr. Soon warmly welcomed delegates from around the world and highlighted the congress theme, "**Chemistry for Sustainable Future**", underscoring the pivotal role of chemistry in addressing global challenges and driving progress towards the United Nations Sustainable Development Goals (SDGs). The Congress was officially declared open by Datuk ChM Dr. Soon Ting Kueh, Organising Chairperson of IUPAC 2025, who ceremoniously struck the gong three times, symbolising the commencement of the congress and setting the stage for a week of scientific exchange and collaboration.

### THE IUPAC PRIZE PRESENTATIONS

A series of IUPAC Prize Presentations followed, recognising exceptional achievements in the chemical sciences. Awards presented during the ceremony included:

- 2025 IUPAC Distinguished Women in Chemistry or









Chemical Engineering

- 2024 and 2025 IUPAC–Solvay International Award for Young Chemists
- IUPAC 2025 Zhejiang NHU International Award for Advancements in Green Chemistry

These honours celebrated excellence in research, innovation, and leadership, while reinforcing IUPAC's commitment to diversity, sustainability, and the advancement of chemistry worldwide.

### THE WELCOME RECEPTION

The Welcome Reception was held on the evening of 14th July 2025, immediately following the Opening Ceremony, in the picturesque Grand Ballroom of the Kuala Lumpur Convention Centre. This elegant gathering offered delegates the chance to unwind and network in a relaxed atmosphere while being introduced to the vibrant cultural heritage of Malaysia.

As guests arrived, they were greeted by the melodious strains of the gamelan, the traditional Malay orchestra, creating an inviting and festive ambience. The evening's highlight was a captivating series of cultural performances, showcasing the diversity and richness of Malaysia's traditions. An impressive array of local delicacies was served, allowing delegates to savour the distinctive flavours of Malaysian cuisine. The reception proved to be an excellent platform for participants from around the world to connect, exchange ideas, and foster new relationships in a warm and welcoming setting. The combination of cultural immersion, culinary delights, and genuine hospitality made for a memorable evening, setting the tone for an enriching and collaborative congress ahead.

### THE SCIENTIFIC PROGRAMME

The congress featured a robust and diverse scientific agenda. Expert speakers from around the world shared advancements on emerging technologies, professional ethics, gender equity, chemical safety, and responsible practices in chemistry.

The congress covers a wide range of topics as follows:

### CLUSTER I – PURE & APPLIED CHEMISTRY SYMPOSIUMS

- Physical & Biophysical
- Inorganic & Bioinorganic
- Organic & Biomolecular
- Polymer & Materials
- Analytical & Forensic
- Environmental
- Cheminformatics
- Human Health & Well Being
- Education & Public Understanding
- Green Chemistry

### CLUSTER II – CHEMISTRY & SDGs

- SDG2: Zero Hunger [Agriculture & Food Chemistry]
- SDG3: Good Health & Well Being [Natural Products & Medicinal Chemistry]
- SDG5: Gender Equality [Ethics, Diversity and Inclusion in Science Education]
- SDG6: Clean Water & Sanitation [Water & Wastewater Management]
- SDG7: Affordable & Clean Energy [Renewable & Low-cost Energy]
- SDG13: Climate Action [Sustainable & Green Chemistry]

### CLUSTER III – THEMATIC SESSION

- Artificial Intelligence in Chemistry
- Young Ambassador for Chemistry (YAC) Programme on Chemistry in Everyday Life
- Green Chemistry in Education
- Symposium on Chemical Safety and Security
- Invest Sarawak
- Malaysian Rubber Board (MRB) Celebrating 100 Years of Excellence in Rubber and Latex Sciences
- Professional and Responsible Practices in Chemistry Including Responsible Care
- PhosAgro/UNESCO/IUPAC Symposium on Green Chemistry: Experience and Opportunities for Cooperation for Sustainable Future
- American Chemical Society (ACS) on Campus
- The Royal Society of Chemistry (RSC) Forum on Open Knowledge Dissemination
- International Younger Chemists Network (IYCN) / Malaysian Young Chemists Network (MYCN) - Young Chemist Programme

### PLENARY LECTURES

- Realizing Chemistry's Pivotal Role in Our Sustainable Future: Prof Peter Mahaffy, King's University, Canada
- The Exciting Potential of AI for Drug and Therapeutic Discovery: Prof David Winkler, La Trobe University, Australia
- From Coherence in Photosynthesis to Chemical







Quantum Information Science: Prof Gregory Scholes, Princeton University, United States

- Green Chemistry toward Low-sugar Universal Vaccines and Glycoengineered Antibodies: Prof Chi-Huey Wong, Scripps Research Institute, United States
- Pushing Boundaries: Innovations in Organometallic Complexes and Catalysts for Advanced Chemical Transformations: Prof Zhaomin Hou, RIKEN Center for Sustainable Resource Science, Japan
- Rethinking Fluorine Chemistry with Global Challenges in Mind: Prof Veronique Gouverneur, University of Oxford, United Kingdom
- Advancing the Frontiers of Semiconducting Polymers Through Precision Synthesis: Prof Christine K Luscombe, Okinawa Institute of Science and Technology, Japan
- Design and Synthesis of Nanomaterials for Biomedical and Energy Applications: Prof Jackie Yi-Ru Ying, King Faisal Specialist Hospital & Research Centre, Saudi Arabia
- Biosensors Without Frontiers: Nucleic Acid Testing in Low Resource Areas: Prof Lisa Hall, University of Cambridge, United Kingdom
- Continuous Movement of Carbon Atoms in Organic Molecules: Merry-Go-Round Reactions: Prof Tamotsu Takahashi, Hokkaido University, Japan
- Cinematic Chemistry: The Journey of Electron Microscopy from Organic Synthesis to Molecular Statistics: Prof Eiichi Nakamura, University of Tokyo, Japan
- Single-Atom Catalysis: Prof Zhang Tao, Chinese Academy of Sciences, China

## AWARD AND SPECIAL LECTURES

### 2025 CHEMISTRY EUROPE AWARD LECTURE

g-xTB: DFT accuracy at tight-binding speed: Prof Stefan Grimme, University of Bonn, Germany

### IUPAC-SOONG PRIZE FOR SUSTAINABLE CHEMISTRY LECTURE

Reticular Chemistry, Climate, AI  
Prof Omar Yaghi, University of California, United States

### PHOSAGRO/UNESCO/IUPAC/IKM LECTURE

The Stockholm Declaration on Chemistry for the Future: Prof Paul T Anastas, Yale University, United States

### IKM GOLD MEDAL AWARD LECTURE

Mesostructured Materials Driving Innovations in Clean Energy and Environmental Sustainability: Edward Juan Joon Ching, Universiti Malaya, Malaysia

## KEYNOTE LECTURES

A total of 93 Keynote Lectures from all around the world presenting their researches and collaborations.

## ORAL AND POSTER PRESENTATION

The congress has attracted approximately 1,700 abstract submissions. We would like to thank all the oral and poster presenters for their support. IUPAC 2025 featured an extensive Poster Sessions, with a total of 517 posters accepted for onsite presentations. These sessions provided a dynamic platform for researchers to showcase their work, share innovative findings, and foster discussions with fellow delegates. We are honoured to have welcomed more than 700 oral presenters at IUPAC 2025, each contributing their expertise and sharing valuable research that enriches the global chemistry community.

## IYCN-MYCN YOUNG CHEMIST PROGRAMME

The IYCN-MYCN Young Chemist Programme is a collaborative initiative between the International Younger Chemists Network (IYCN) and the Malaysian Young Chemists Network (MYCN), held in conjunction with IUPAC 2025 on 15th, 17th and 18th July 2025. This programme aims to empower early-career chemists by providing a dynamic platform for networking, skill-building, and professional development. Through workshops, panel discussions, and interactive sessions, participants will engage with global leaders in chemistry, foster international collaborations, and explore career pathways in academia, industry, and beyond.

## YOUNG AMBASSADOR OF CHEMISTRY (YAC) PROGRAM

On 17 July 2025, the Department of Chemistry Malaysia (CHEMISTRY Malaysia) launched the Young Ambassador of Chemistry (YAC) program, officiated by Director-General YBrs. ChM Puan Marhayani binti Md Saad. The Young Ambassadors for Chemistry (YAC) program, an initiative under IUPAC/CCE, continues to inspire future scientists through its global "Train the Trainers" approach. Since 2003, YAC has reached 17 countries, bringing teachers and students together to promote chemistry education and outreach. This year, the program was hosted by the Department of Chemistry Malaysia, gathering 20 teachers and 100 students for a day of enriching lectures and hands-on training. Participants explored how chemistry connects to the United Nations Sustainable Development Goals (SDGs), with activities such as food and microbiological analysis (SDG 3: Health), knowledge-sharing (SDG 4: Education), water testing (SDG 6: Clean Water), Halal authentication (SDG 8: Decent Work), precision weighing (SDG 12: Responsible Consumption), and forensic science (SDG 16: Peace & Justice). By equipping teachers and students with practical skills, confidence, and leadership, the YAC program empowers participants to champion chemistry within their schools and communities, shaping tomorrow's scientific leaders.

## MOA SIGNING BETWEEN PHOSAGRO AND IKM

Agreement on Cooperation Between PhosAgro and IKM in the International Promotion of Fundamental Sciences, Cooperation in Education and Research and Digital





Educational Technologies was signed on 17 July 2025 during the “PhosAgro/UNESCO/IUPAC Symposium Green Chemistry: Experiences and Opportunities for Co-operation for Sustainable Future” thematic session, IUPAC 2025, Kuala Lumpur.

Through this partnership, PhosAgro and IKM aim to foster global awareness of the importance of basic scientific research, expand academic exchanges and joint research initiatives, and introduce modern digital platforms that make scientific knowledge more accessible. The cooperation underscores a shared commitment to sustainability, innovation, and the development of green chemistry as a tool for addressing global challenges, while strengthening ties between the scientific communities of Russia and Malaysia in the pursuit of knowledge-driven sustainable development.

## IUPAC - IKM MELISSA CHAN MEMORIAL PRIZE POSTER PRESENTATION COMPETITION

The IUPAC–IKM Melissa Chan Memorial Prize Poster Presentation Competition was established in honour of the late Professor ChM Dr Melissa Chan, in recognition of her significant contributions to the field of polymer science. A total of 69 eligible posters participated across two sessions. Judging was conducted in a silent format without presenter involvement. A panel of 14 judges was appointed and divided into groups to evaluate the entries based on predetermined criteria. A total of RM1,750.00 cash prizes, sponsored by Institut Kimia Malaysia (IKM), was awarded to the top three winners of the competition. The First-Place winner received RM1,000.00, the Second-Place winner received RM500.00, and the Third-Place winner received RM250.00. In addition to the cash prizes, all winners were presented with a certificate of achievement in recognition of their outstanding accomplishments.

*Winners:*

1st Place: Mr Zhi Yuan Lee, Singapore  
2nd Place: Ms Sumontha Ramangkoon, Thailand 3rd Place: Prof Zainab Ngaini, Malaysia

## IUPAC 2025 SCHOLARSHIP

IUPAC 2025 offered scholarships for the young chemists from developing countries aimed at supporting delegates from resource-limited settings, particularly those from low- and middle-income countries. These grants were designed to broaden access to the congress, ensuring diverse participation and fostering collaboration across regions and disciplines within the global chemistry community.

A key focus was on encouraging the participation of young scientists, researchers, and students in chemistry and related fields. By providing financial support, IUPAC 2025 sought to empower the next generation of chemists to present their work, exchange ideas, and connect with international leaders driving innovation in chemical sciences. Eligibility and selection criteria were clearly outlined, with emphasis placed on the quality and relevance of the





applicants' submitted abstracts or research projects. In total, IUPAC 2025 awarded 40 scholarships to young chemists from developing countries, enabling recipients to present their findings to an international audience, gain feedback, and build lasting collaborations.

We extend our special thanks to Institut Kimia Malaysia and the Malaysia Convention & Exhibition Bureau (MyCEB) for their support on this initiative.

## **MALAYSIAN RUBBER BOARD (MRB) CELEBRATES 100 YEARS OF EXCELLENCE IN RUBBER AND LATEX SCIENCES DURING IUPAC 2025**

On 16 July 2025, the Malaysian Rubber Board (MRB) successfully organised the MRB Forum: Celebrating 100 Years of Excellence in Rubber and Latex Sciences at the KLCC Convention Centre, Kuala Lumpur, during the IUPAC 2025. The event was officiated by YBhg. Tan Sri Dato' Sri Ahmad Badri bin Mohd Zahir, Chairman of MRB, in recognition of a century-long journey marked by innovation, scientific leadership, and global impact in the rubber and latex research domain. From pioneering research in the early 20th century to today's advanced technologies and sustainable practices, MRB continues to lead as a key driver of natural rubber growth and transformation in the industry. This forum brought together researchers, industry players, and stakeholders to reflect on the past, celebrate present achievements, and envision the future of rubber science in Malaysia.

As MRB steps into its second century, it remains committed to advancing the rubber sector through innovation, sustainability, and global collaboration.

## **IUPAC 2025 GALA DINNER**

The IUPAC 2025 Gala Dinner took place on 16 July 2025 at the prestigious Shangri-La Hotel, Kuala Lumpur, bringing together a full house of more than 800 delegates from across the globe. It was a remarkable evening that celebrated not only the spirit of science but also Malaysia's vibrant cultural heritage. The evening commenced with a spectacular Lion Dance performance, as the lions proudly ushered the VIP guests into the Grand Ballroom with an air of festivity and good fortune. The energy continued to build with a short yet powerful performance of the Lion Dance on stage, setting a joyful and auspicious tone for the dinner.

Guests were later enthralled by one of the evening's highlights—the mesmerising Mask Changing performance, which drew rounds of applause for its artistry and mastery.

Adding a heartfelt dimension to the evening, the National Council of Senior Citizens Organisations, Malaysia (NASCOM) delighted the audience with a moving choir and duet performance, showcasing the spirit of inclusivity and community.

The Gala Dinner also featured a beautiful showcase of Malaysian cultural performances, reflecting the country's









diverse traditions through music and dance.

The night was filled with camaraderie, cultural appreciation, and celebration—leaving delegates with lasting memories of fellowship, joy, and Malaysian hospitality. It was a fitting highlight of IUPAC 2025, strengthening bonds within the global chemistry community and underscoring the congress's spirit of unity, collaboration, and cultural exchange.

## IUPAC 2025 APPRECIATION DINNER

On 17 July 2025, the Institut Kimia Malaysia (IKM) hosted the IUPAC 2025 Appreciation Dinner at the Mandarin Oriental Hotel, Kuala Lumpur, to honour the invaluable contributions of those who made the congress a success. The evening was a heartfelt occasion to recognise the unwavering support of the organising committee, IUPAC Council and officers, plenary and invited speakers, sponsors, partners, and collaborators who played a key role in bringing the global chemistry community together.

A token of appreciation was presented to acknowledge their dedication and commitment. Adding a personal touch, members were invited on stage to share their reflections and words of thanks, creating an atmosphere of camaraderie and gratitude.

The dinner underscored the spirit of partnership and collaboration that defined IUPAC 2025, while celebrating the collective effort behind its success. It was not only an evening of appreciation but also a reaffirmation of the strong ties within the global chemistry community, paving the way for future collaborations.

## IUPAC 2025 CLOSING CEREMONY

The Closing Ceremony of IUPAC 2025 was held on 19 July 2025, marking the conclusion of the 50th World Chemistry Congress in Kuala Lumpur. The ceremony highlighted the achievements of the congress and celebrated the strong spirit of international collaboration in chemistry. Prof. Ehud Keinan delivered the closing address and officially announced Montréal, Canada as the host city for IUPAC 2027. Datuk ChM Dr Soon then delivered a heartfelt speech, expressing gratitude to the committees, speakers, sponsors, and delegates whose contributions ensured the success of IUPAC 2025. The event closed with warm applause and optimism for future congresses.

On behalf of the organising committee, heartfelt appreciation is extended to all supporters, partners, sponsors, and exhibitors whose contributions were vital to the success of IUPAC 2025. Special thanks to Malaysia Convention & Exhibition Bureau (MyCEB) for their continuous supports. Looking ahead, it is hoped that the knowledge shared, collaborations forged, and commitments renewed during IUPAC 2025 will drive continued innovation in chemistry and contribute meaningfully to the pursuit of a sustainable future.



# Researchers Uncover a Complex Chemistry of Ketum Leaves

Thiruvenanthan Karunakaran<sup>a</sup>, Balasingam Vicknasingam<sup>a</sup> and Marek C. Chawarski<sup>b</sup>

<sup>a</sup> Centre for Drug Research, Universiti Sains Malaysia, Penang, Malaysia

<sup>b</sup> Yale School of Medicine, Departments of Psychiatry and Emergency Medicine, New Haven, CT

A team of researchers from USM and Yale discovered that chemical composition of Ketum leaves is more complex than previously thought. Preparations made from fresh Ketum leaves have been consumed in Malaysia and other Southeast Asian countries as botanical remedies or natural supplements for more than a century. Ketum (*Mitragyna speciosa* Korth.) or commonly known as Kratom is a botanical species from the Rubiaceae family, closely related to the coffee plant. It is indigenous to the tropical regions of Southeast Asia, with northern peninsular Malaysia as a primary area of cultivation due to favorable climatic conditions. Ketum leaves have been used to alleviate fatigue and improve endurance during physically demanding activities. Consumption methods typically include chewing fresh leaves or preparing aqueous decoctions, which are reported to have analgesic and stimulant effects.

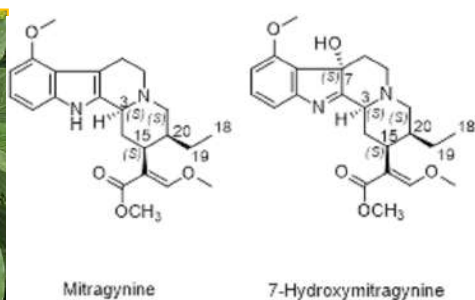
Phytochemical studies have identified mitragynine as the predominant alkaloid in Ketum leaves, along with structurally related congeners such as speciociliatine, speciogynine, and paynantheine. Additionally, Ketum contains diverse bioactive compounds including phenolic acids and flavonoids like rutin and various quercetin derivatives. Although research has mainly focused on mitragynine and its oxidative derivative, 7-hydroxymitragynine as key contributors to Ketum's pharmacological actions yet the full chemical complexity of the plant remains inadequately characterized. It is essential to understand that mitragynine alone does not fully account for the therapeutic effects observed with ketum use. Instead, these effects arise from synergistic interactions among multiple alkaloids, other phytochemicals, and compounds generated during post-harvest processing. Therefore, a thorough understanding of ketum's bioactivity requires comprehensive chemical profiling encompassing its entire phytochemical matrix and the transformations that occur from leaf harvest to preparation.

During the past 20 years, there has been a growing interest among consumers in the United States and other Western countries in natural, botanical, supplements and medicines. An increasing demand for products derived from the Ketum plant are one example of the rapidly growing wellness industry in the West. However, products labelled as "made from Ketum" that are sold and consumed in the US are distinctly different from true Ketum consumed in Malaysia, Thailand, Indonesia, and other countries in the region. There is also some evidence that Western "Ketum" labeled products that are being

manufactured without regulatory oversight and that are traded via unregulated markets may not be as safe as the true natural Ketum consumed in Malaysia.

In the recently published article entitled "Phytochemical analysis of water and ethanol liquid extracts prepared using freshly harvested leaves of *Mitragyna speciosa* (Korth.)" in the Natural Product Research journal, Dr. Thiruvenanthan Karunakaran and Prof Vicknasingam B Kasinather (USM) and Prof Marek C. Chawarski (Yale) reported that freshly harvested Malaysian Ketum leaves have different chemical composition than products prepared from dried and highly processed plant material. They demonstrated that during the drying and processing of the fresh Ketum leaves some of naturally occurring chemicals are converted into a different chemical substance that may be responsible for some of adverse effects reported by consumers of "Ketum" labeled products that are sold in the US. The same researchers also published a review of current scientific literature titled "Research and publication gaps on kratom and kratom products: a scoping review of current literature" in the Current Opinion in Psychiatry journal. Expanding on the historical and traditional uses of Ketum plant in Malaysia, a multidisciplinary research program at the Centre for Drug Research (CDR), USM designated as a Malaysian Higher Education Ministry (MOHE) Centre of Excellence (HICoE) has been uniquely focused on studying the native Ketum plant and conducting analytical and clinical studies aimed to understand pharmacology of the full spectrum of natural chemicals within the plant. In 2020, the USM and Yale researchers published a randomized, placebo controlled, double-blind study demonstrating pain relieving properties of a traditional drink prepared from freshly harvested Ketum leaves, which is commonly consumed in Malaysia and other countries in the region. The USM researchers are collaborating closely in their Ketum studies with researchers from Yale University.

In Malaysia and other Southeast Asian countries, cultivation and safe consumption of natural Ketum products has a documented longstanding history. While the growing popularity of "Ketum" labeled products manufactured for and consumed by the Western consumers is very frequently advertised and marketed using the historical records and personal narratives from the Southeast Asian region. The Western consumers are not aware about important differences between the true Ketum, and the highly processed products available in the US and other countries in the West. Better understanding of differences in pharmacology and safety between true natural Ketum and the "Ketum" labeled products is critically important. In the US and other Western countries there have been numerous reports of adverse effects or even fatalities attributed to consumption products labeled as containing "Ketum" or several chemicals that are found in Ketum. At the same time no similar rates or severities of rarely reported adverse events are observed in Malaysia or other countries in the region.





The Ketum research studies conducted by the Centre for Drug Research USM and Yale University researchers advance the scientific knowledge about the Ketum plant and its potential for botanical-based medicines and aim to provide scientific foundations for future development and commercialization of safe medicines. The Malaysian government and commercial entities should increase their interest and support for current and future Ketum research.

#### References:

- Karunakaran T, Balasingam V, Chawarski MC. 2024. Phytochemical analysis of water and ethanol liquid extracts prepared using freshly harvested leaves of *Mitragyna speciosa* (Korth.). Nat. Pro. Res. <https://doi.org/10.1080/14786419.2024.2362428>.
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## Webinar on IKM/RSC–Synthomer Award in Polymer Science & IKM Research Prize in Polymer and Materials Science: Insights from Awardees

Phang Sook Wai, Lee Siang Yin, Yuziah Yunus, Siti Nurul Ain Md Jamil, Rusli Daik

The Division of Polymers and Materials Chemistry (DPMC) of the Malaysian Institute of Chemistry (IKM) successfully hosted the *Webinar on IKM/RSC–Synthomer Award in Polymer Science & IKM Research Prize in Polymer and Materials Science: Insights from Awardees* on 25th June 2025, from 9.00 AM to 11.00 AM. The objective of the webinar was to raise greater awareness of the two notable awards presented annually by IKM to recognize outstanding contributions and potential in the fields of polymer and materials science.

The IKM-RSC Synthomer Award in Polymer Science is a prestigious prize jointly awarded by IKM and the Royal Society of Chemistry (RSC), with sponsorship from Synthomer Sdn Bhd. It is conferred upon fresh PhD graduates who have demonstrated excellence in polymer science research. Meanwhile, the IKM Research Prize in Polymer and Materials Science, sponsored by Synthomer Sdn Bhd and HARPS Global Ptd Ltd, is dedicated to recognizing the promising research work of current PhD students. Both awards reflect IKM's ongoing commitment to cultivating excellence and innovation among Malaysia's young scientific talents.

These two prizes are awarded annually and form part of a broader recognition framework spearheaded by IKM. The official prize-giving ceremony takes place during Malam Kimia, IKM's prestigious Annual Dinner. Malam Kimia serves as a grand celebration of achievements in chemistry, where other distinguished IKM awards are also presented. Being recognized during this high-profile event adds further prestige and visibility to the recipients of the prizes. To support outreach and inspire future applicants, this year's webinar featured four invited talks by former prize recipients who shared not only their cutting-edge research but also their personal journeys. The event was led by an experienced and dedicated organizing committee, comprising Prof. ChM Dr. Phang Sook Wai,

ChM Dr. Lee Siang Ying, ChM Dr. Yuziah Yunus, and Associate Professor ChM Dr. Siti Nurul Ain Md Jamil, assisted by Mr. Azizi under the banner of IKM's Division of Polymers and Materials Chemistry. Their coordination ensured attendees a smooth, insightful, and engaging session.

The webinar attracted around 90 participants, including postgraduate students, early-career researchers, and academics from across Malaysia. It provided an excellent platform for knowledge exchange, mentoring, and academic networking, further reinforcing the importance of recognition and support for young scientists in niche research fields. The webinar began with a welcoming speech delivered by Prof. ChM Dr. Rusli Daik (the Chairperson of DPMC), setting the tone for an engaging session. This followed insightful presentations by recipients of the prizes, highlighting outstanding postgraduate research in polymer and material science. The recipient of IKM/RSC - Synthomer Award in Polymer Science 2024.

- Tailoring the Electrical, Antibacterial and Durability Properties of Electroactive Fabric-based Polyaniline for Potential Uses in Wearable Bioelectronics by Dr. Muhammad Faiz bin Aizamuddin (Universiti Teknologi MARA).

The recipient of IKM Research Prize in Polymer and Materials Science 2024

- Interaction Between Polyaniline and Hierarchical Ordered Porous Biotemplated Derived Carbon-Doped Graphitic Carbon Nitride for Photocatalytic Hydrogen Peroxide Generation by Nur Shamimie Nadzwin Binti Hasnan (Universiti Kebangsaan Malaysia)
- Development Of ZnO/CdS Photocatalyst for The Degradation of Organic Pollutants by Salma Izati Binti Sinar Mashuri (Universiti Teknologi MARA)
- Oil Palm Cellulose Nanofibrils/Graphene nanoplatelets Reinforced Green Epoxy Hybrid Nanocomposites by Yusuf Jameel (Universiti Putra Malaysia)





company's sponsorship and support for the awards. They expressed their support and appreciation for the academic excellence demonstrated by the award recipients. Additionally, the moderator, ChM Dr. Yuziah, provided valuable supplementary information to the audience regarding both research awards and the prize opportunities.

This initiative not only strengthens the visibility of the IKM/RSC Synthomer Award and the IKM Research Prize in Polymer and Materials Science but also underscores IKM's broader vision of fostering scientific excellence, industry-academia collaboration, and the next generation of polymer and materials researchers in Malaysia. With the continued support of Synthomer Sdn Bhd and HARPS Global Pte Ltd, IKM looks forward to further uplifting the standard of polymer science research in Malaysia through these meaningful recognitions. The webinar ended with a group photo session featuring the speakers, sponsors, and organizing team, marking a successful conclusion to a morning of meaningful knowledge sharing and networking.

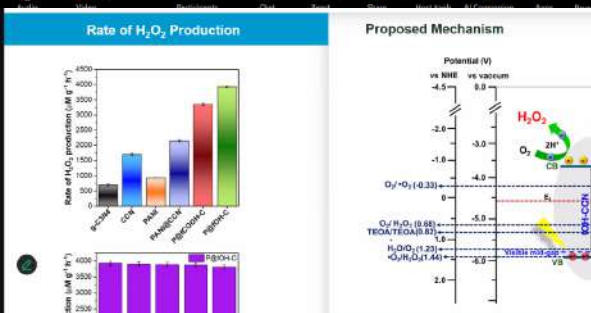
**UNIVERSITI TEKNOLOGI MARA**

**Development of ZnO/CdS Photocatalyst for the Degradation of Organic Pollutant**

**SALMA IZATI SINAR MASHURI<sup>1,2</sup>**

<sup>1</sup>Centre for Functional Materials and Nanotechnology, Institute of Science, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.

<sup>2</sup>School of Chemistry and Environment, Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.



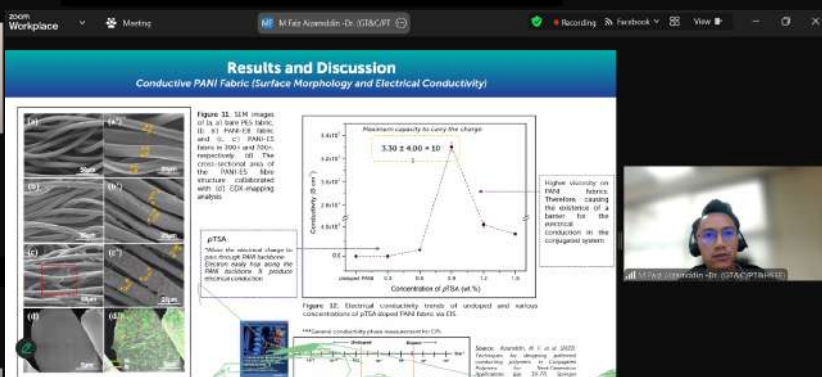
Each speaker elaborated on the motivation behind their research, methodologies, challenges encountered, and how receiving the award has helped elevate their academic and professional trajectory. The sessions also offered practical advice for potential applicants on how to prepare strong submissions, the importance of impactful research, and the value of active engagement within the scientific community. The webinar also featured brief remarks by Dr. Ng Tian Hong, Group Chief Strategy Officer of HARPS Global Pte Ltd, and Dr. Goh Yi Fan, Senior Technical Manager at Synthomer Sdn. Bhd., in recognition of their

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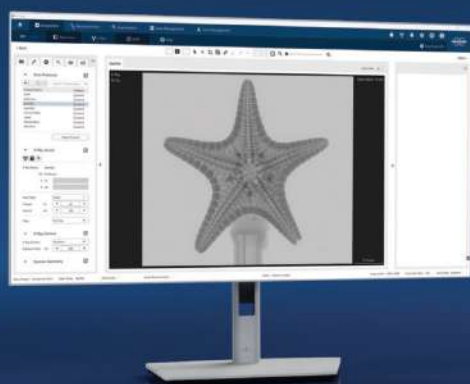
**Oil Palm Cellulose Nanofibrils/Graphene nanoplatelets Reinforced Green Epoxy Hybrid Nanocomposites**

**Presented by: Yusuf Jameel**

Supervisor: S.M. Sapuan  
Co-supervisors: Umar Rashid, R.A. Iyaz, Mir Hassan

Advanced Engineering Materials and composites Research Centre (AEMC), Department of Mechanical and Manufacturing Engineering, Faculty of Engineering, University Putra Malaysia





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## Karnival Kimia Malaysia (K2M) 2025: Igniting Young Minds with the Wonders of Science

On 12 and 13 April 2025, IMU University in Bukit Jalil buzzed with energy as it hosted *Karnival Kimia Malaysia (K2M) 2025*, a two-day national science carnival themed “*Exploring the Wonders of Science*.” Co-organised by the School of Pharmacy, IMU University and Institut Kimia Malaysia (IKM), and endorsed by *Minggu Sains Negara* with support from the Ministry of Education (MOE), the carnival drew over 300 secondary and pre-university students, teachers, and members of the public from across Malaysia. K<sub>2</sub>M 2025 aimed to ignite interest in science through immersive experiences, highlight the relevance of chemistry in daily life, and inspire students to pursue careers in chemistry and science-related fields.

### A Grand Opening and Esteemed Guests

The event opened on 12 April with a lively ceremony officiated by Prof. Dr. Ian Martin Symonds (Deputy Vice-Chancellor, IMU), Prof. Dr. Ong Chin Eng (Dean, School of Pharmacy, IMU), and several IKM Council Members including Prof. ChM. Dr. Juan Joon Ching, DCP (R) Dato’ ChM. Dr. Yew Chong Hooi, ChM. Dr. Li Hui Ling (K<sub>2</sub>M Advisor), and Prof. ChM. Dr. Phang Sook Wai. The ceremony featured inspiring speeches, a ribbon-cutting, and a spirited performance by IMU’s Pharmaceutical Chemistry students.

### Event Highlights

#### Malaysia Schools’ Analyst Competition

A flagship event was the *Malaysia Schools’ Analyst Competition*, organised in collaboration with the Royal Society of Chemistry (UK). Students first competed in an online round on 23 March, with the top 30 finalists in each category (high school and Pre-U) advancing to the Grand Finale at IMU on 12 April. There, they undertook real-world laboratory tasks, showcasing skills in analytical chemistry, precision, and problem-solving.

#### Hands-on Workshops and Interactive Booths

Throughout both days, participants engaged in hands-on workshops covering soap and lip balm making, hydrogel synthesis, painkiller extraction, and advanced lab techniques. These sessions helped students apply theoretical knowledge, boost lab confidence, and explore chemistry in action. Interactive booths highlighted diverse science fields—pharmaceutical and medicinal chemistry, biotechnology, nutrition, biomedical science, and nursing—through mini-experiments, games, and demonstrations that fostered interdisciplinary learning.

### Poster and Video Competitions

Held on 13 April, these competitions gave students a platform to creatively communicate scientific ideas through visual storytelling, sharpening their presentation and science communication skills.

### Thought-Provoking Forums

Two forum sessions expanded students’ perspectives on chemistry and healthcare. The first forum, “*Chemistry: A World of Endless Possibilities*,” brought together experts from academia, government, and industry. Panellists included:

- **Prof. ChM. Dr. Juan Joon Ching** (University of Malaya), an authority on nanotechnology and catalysis.
- **ChM. Dr. Li Hui Ling** (Department of Chemistry Malaysia), expert in chemical metrology and lab accreditation.
- **Dr. June Sim Su-Way** (Tigermed Malaysia), IMU alumna in clinical research.
- **ChM. Natasha Stella Tibon** (Anchor Centre for Certification), IMU alumna in regulatory affairs.

**Assoc. Prof. ChM. Dr. Lee Choy Sin**, moderator and Associate Dean of Research at IMU, who also highlighted essential professional values and soft skills for chemists. The second forum, “*Bridging Science and Patient Care*,” focused on pharmacy’s intersection with healthcare. Moderated by Dr. Kaeshaelya Thiruchelvam (IMU), it featured:

- **Ms. Choo Suit Won** (Health Lane Family Pharmacy), offering insights from retail pharmacy.
- **Mr. Jordy Wong Der Yuan** (Pantai Hospital), on clinical pharmacy roles.
- **Mr. David Ong** (Dear Kyra), presenting innovative health solutions from an entrepreneurial perspective.

### Student Leadership and Participation

K<sub>2</sub>M 2025 was powered by an enthusiastic team of IMU Pharmaceutical Chemistry students. Under faculty guidance, they led planning, logistics, promotion, and on-site coordination. Their roles extended to testing workshop activities, managing booths, and facilitating sessions with clarity and confidence.

### Survey Insights: Growing Confidence Through Experience

A pre-event survey of 281 participants aged 16–19 revealed that while 71.2% had strong interest in chemistry, only 33.1% felt confident in their knowledge. Notably, 60.5% were attending a science-based event for the first time. The post-event survey







gathered 222 responses, with 77.5% rating the event as engaging and 93.1% describing their overall experience as excellent to good. The most popular activity was the hands-on workshops (70%), followed by interactive booths (15%) and the analyst competition (14%). About 70% reported increased interest in chemistry, and 96.4% said the carnival deepened their understanding of its relevance in everyday life.

## Voices from the Ground

Participants praised the workshops for making science exciting and accessible—activities like titrations, soap making, vitamin C tests, and ELISA assays stood out. Many students noted they gained lab confidence and clearer views on science careers.

Booths were commended for being fun and educational, while the analyst competition was described as challenging and rewarding, giving students real-world context for their classroom learning.

## Conclusion: Advancing the Mission of K2M

K<sub>2</sub>M 2025 successfully fulfilled its mission of promoting science literacy and sparking passion for chemistry among young Malaysians. By blending competitions, forums, workshops, and exhibitions, the event bridged theory and practice while inspiring future scientists. As a flagship outreach initiative of IKM, it continues to play a vital role in shaping Malaysia's scientific future.

## Acknowledgements and Reflections

The organisers extend sincere thanks to IKM, IMU's School of Pharmacy, the Student Representative Council (SRC), and sponsors such as Xepa-Soul Pattinson, Health Lane Pharmacy Group, and Mamami Shoppe for their invaluable support. For the student organising committee, the experience was transformative. Led by Organising Chair Assoc. Prof. ChM. Dr. Lee Choy Sin, they grew in confidence, teamwork, and leadership—gaining not only skills but a deeper sense of purpose in giving back to the community and promoting the wonders of science.





## DAS – IKM WEBINAR SERIES 2025

### “Frontiers in Applied Chemistry: Innovations for a Sustainable Future” by IKM Division of Theoretical & Physical Chemistry

On 28<sup>th</sup> May 2025, DAS – IKM successfully organized an exciting webinar “Frontiers in Applied Chemistry: Innovations for a Sustainable Future.” The webinar aimed to introduce the emerging trends in applied chemistry, focusing on industry relevance. This webinar was hosted by the Department of Applied Science (DAS), organized by American Chemical Society – UTP International Student Chapter (ACS- UTP ISC) and IKM Division of Physical and Theoretical Chemistry (DPTC).

The American Chemical Society (ACS) is one of the world's largest and most respected scientific organizations, dedicated to advancing the knowledge and practice of chemistry for the benefit of humanity. Founded in 1876 and headquartered in the United States, ACS supports scientific research, education, and professional development in the chemical sciences. It publishes numerous peer-reviewed journals, organizes international conferences, and provides valuable resources for chemists at all stages of their careers. Through its global student chapters, including the ACS Student Chapter that was established in 2019 at Universiti Teknologi PETRONAS (UTP), the society fosters leadership, academic excellence, and community engagement among aspiring chemists worldwide. The webinar also benefits from strategic collaboration with IKM DPTC. The involvement of IKM, the country's official professional body for chemists, alongside the ACS-UTP Student Chapter, lends strong credibility to the event. These collaborations not only boost the event's prestige but also expand its networking potential, exposing students to key players in both academia and industry. This webinar has attracted 92 participants from various background ranging from chemist, technologist, lecturers and students from local and private institutions in Malaysia and abroad such as Pakistan, India, Indonesia and etc. During the webinar, one of the main strengths of this event lies in its diverse and relevant talk titles, which are distinct yet interconnected under the broader theme of applied chemistry and sustainability. For instance, “Quest for High Performance Storage Device” that was present by one of our distinguished speakers, Prof ChM Dr Chong Kwok Feng addresses critical advancements in materials science and energy storage, which are increasingly important in green energy and industrial applications and the talk on “IKM & Chemist as a

DAS - IKM WEBINAR SERIES 2025

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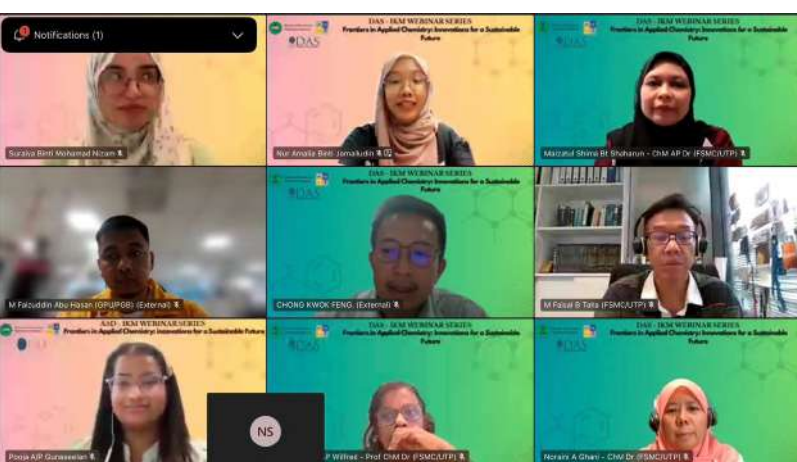
Division of Physical and Theoretical Chemistry

UTP

Profession” provides much-needed professional and career development insights that are often missing from typical academic programs. Meanwhile, Assoc Prof ChM Dr Maizatul Shima Shaharun addressed “Current and Future Perspectives on Photoelectrocatalytic Reduction of Carbon Dioxide for Sustainable Carbon Utilization” explores cutting-edge research in CO<sub>2</sub> conversion and sustainability, a globally significant challenge. Together, these talks cover a rich spectrum of both applied research and career development topics, offering something valuable for all attendees.

The webinar is expected to yield a range of beneficial outcomes across multiple areas. In terms of knowledge, students will develop a stronger understanding of applied chemistry within Malaysia's key sectors like energy and materials. Regarding career awareness, the event helps students better understand the professional landscape and available pathways for chemists both locally and globally. It also provides inspiration for research and development, particularly in emerging areas such as green chemistry and sustainable energy. From a networking perspective, participants have the chance to build valuable connections with professionals from IKM and academia, which could lead to internships or job opportunities. Finally, the experience promotes professional development by enhancing students' soft skills and professional confidence through direct interaction with seasoned speakers and experts.

Report by  
Noraini binti Abd Ghani, Chong Kwok Feng, Phang Sook Wai







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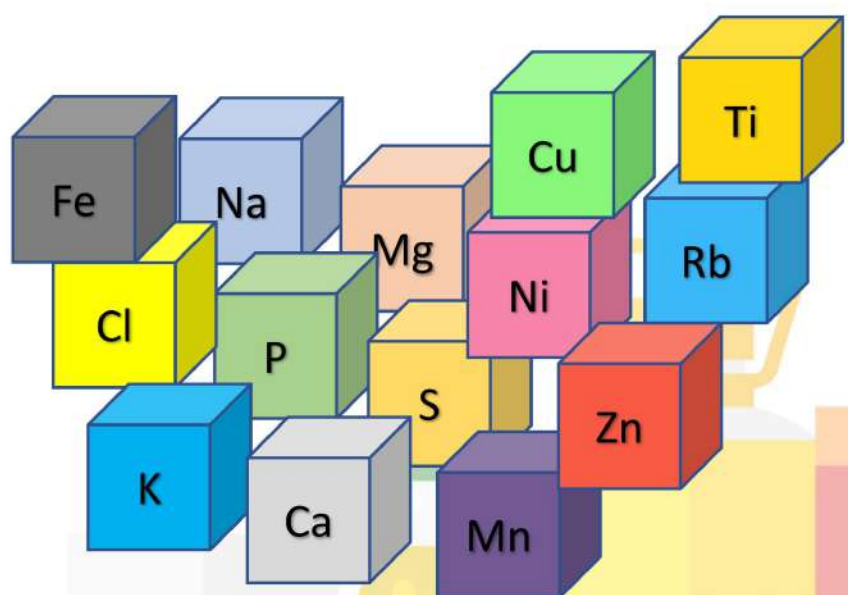


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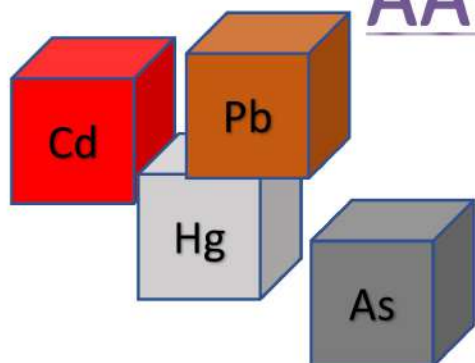


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# From Pioneers to Paradox: Rethinking Malaysia's Chemical Research Ecosystem

Fatimah Salim, Zuriati Zakaria and Awis Sukarni Mohmad Sabere

## Introduction

Chemical research in Malaysia began with remarkable promise. In the early decades following independence, Malaysia was among the pioneers of scientific development in the region. Our universities were among the first to offer specialised chemistry programmes. We built research centres, trained generations of chemists, and laid the groundwork for natural product discovery, analytical sciences, and applied chemical technologies. For a time, Malaysia led where others followed. But today, the landscape tells a different story. While our neighbours, countries that once looked to us for scientific leadership, are now making major strides in research translation, regional collaboration, and industrial integration, Malaysia appears to be stagnating. The seeds we planted decades ago are now blooming elsewhere. We sowed; they grew. Despite the appearance of progress, expanding publication numbers, well-written policy documents, and periodic bursts of funding, the Malaysian chemical research ecosystem remains burdened by structural inertia. Laboratories fall silent due to failing instruments. Talented researchers leave for more stable opportunities. Grant systems confuse more than they support. The gap between potential and performance widens with each passing year. The insights presented here are not drawn from theory alone, but from decades of lived experience, from the practical mid-career researchers navigating today's complex academic terrain, and a retired professor who has witnessed the evolution of Malaysia's research landscape from its roots. What we offer is not a complaint, but a diagnosis, and a call to action. If Malaysia is to reclaim its place as a regional leader in chemical sciences, we must confront uncomfortable truths and reimagine the way we fund, manage, and lead research in this country. This article lays bare the systemic challenges Malaysian chemical researchers face, across funding, infrastructure, leadership, culture, and career development, and outlines what must change for the ecosystem to thrive again.

## 1. Funding

Robust and sustained funding is the lifeblood of impactful research. Yet in Malaysia, chemical researchers often find themselves entangled in a fragmented, opaque, and overly bureaucratic grant ecosystem. Although a wide array of ministries and agencies offer funding, each with its own mandates and focus areas, the system operates with inconsistent priorities and little coordination. In theory, this diversity should be a strength, offering researchers multiple pathways to support. In practice, however, it creates confusion and inefficiency, particularly for early-career scientists who often lack clear guidance on how to navigate the shifting expectations. Many promising researchers are quietly sidelined, not due to weak proposals, but because they lack the informal networks or "cables" that can influence success, such as connections to evaluators or insider knowledge of selection criteria. The process remains not only cumbersome but also alarmingly non-transparent, discouraging innovation and limiting access to opportunity. Internal institutional grants, though

available, are often minimal and disproportionately burdened by excessive output requirements, sometimes mandating multiple publications or postgraduate supervision within short time. Similarly, collaborative grants frequently demand rigid documentation, and pre-identified publication targets before funding is even approved, limiting flexibility and spontaneity in collaboration. Moreover, bureaucratic procurement systems introduce costly delays. Basic research needs like chemical purchases or equipment servicing can take months to process due to centralised tendering systems, sometimes causing researchers to miss critical milestones or abandon promising directions altogether. The evaluation system also tends to favour established researchers. Some grants are often only accessible to those with Associate Professor or Professor titles, making it difficult for promising early-career researchers to lead or drive large-scale research efforts independently. Although recent efforts aim to address this gap, their limited funding ceilings and narrow acceptance rates still leave many young scientists without a meaningful platform to innovate. Even more troubling is the perception that success in grant applications often depends less on research quality than on personnel politics. Anecdotally, having a prominent evaluator or academic listed as a co-investigator is seen to improve one's chances of approval, regardless of the actual proposal merit. Worryingly, even fundamental research grants are increasingly shifting toward product-driven outcomes. The grants now "encourage" the inclusion of elements such as IP filings and industry partnerships, even when the project is still at a hypothesis-testing stage. While not officially mandatory, reviewers interpret these indicators as essential, further pushing academic proposals toward development rather than discovery.

## 2. Infrastructure and Chemical Management

A persistent, systemic issue across Malaysian research institutions is the lack of a centralised, efficient, and safe chemical management system. Many laboratories still operate with outdated practices, poor inventory tracking, redundant chemical purchases, and inadequate safety measures. Some institutions have no designated chemical officers or working chemical databases, posing serious risks to health, safety, and regulatory compliance. When audits occur, chaos often ensues, not because researchers are careless, but because the institutional systems are broken by design. Even more critically, Malaysia is facing a silent but deepening crisis in scientific instrumentation. High-end analytical tools purchased during earlier funding waves, are aging fast. In many labs, these instruments now sit idle as "white elephants", rendered unusable due to the lack of dedicated budgets for scheduled servicing, calibration, and repair. This lack of a maintenance culture results in prolonged downtimes and costly outsourcing of routine analyses, delaying research progress and increasing operational costs. For postgraduate students and early-career researchers, these disruptions directly impact training, thesis timelines, and competitiveness in publishing. It also means millions of ringgit in public investment is quietly being wasted, not because the instruments are obsolete, but because there is no



plan to sustain them. Adding to this is a siloed culture: institutions often duplicate high-end instruments without a national sharing strategy, leading to scattered expertise and underutilised infrastructure. Even where access to instruments is available, especially in Centres of Excellence, it can be highly centralised, tightly guarded, or, in some cases, politicised, limiting fair access. Universities, by and large, do not prepare long-term maintenance or upgrade plans for research infrastructure. Procurement is still treated as a one-time investment, rather than a life-cycle commitment. Worse, there is no career pathway or competitive remuneration for highly skilled technical support staff, instrument specialists who could help maintain, troubleshoot, and extend the lifespan of costly equipment. These individuals are often underpaid, overburdened, and overlooked, despite being critical to sustaining a functioning research ecosystem.

### 3. Leadership and Institutional Support

A thriving research ecosystem depends not just on funding or infrastructure, but on visionary leadership and a supportive institutional culture. Unfortunately, in many Malaysian universities, research is too often treated as a checkbox KPI, quantified in publication counts and grant income, rather than as a mission anchored in intellectual growth and national impact. Universities frequently lack leaders who truly understand the unique demands of chemical research, a field that is equipment-heavy, safety-sensitive, and often long-term in nature. As a result, decisions made at the top may appear reactive, procedural, or politically safe, rather than strategic or bold. There is also a profound gap in mentorship. Younger academics, especially those early in their careers, often navigate their research journey alone. Senior academics, who should serve as guides, are either too overburdened with their own administrative load or too entangled in institutional politics to offer consistent mentorship. Without this guidance, many early-career researchers struggle to write compelling grant proposals, navigate publishing expectations, or build collaborative networks, resulting in lost momentum and missed opportunities. To make matters worse, academics are increasingly expected to wear multiple hats simultaneously: teach large class loads, secure grants, publish, supervise postgraduates, manage departments, and generate income, all within the same contract period. These “multi-role academics” are stretched thin, with minimal institutional support and few protected hours for research. This overextension directly undermines the quality of scientific work, reduces innovation, and leads to widespread burnout, especially among Malaysia’s most promising young talents. A striking irony is that many university leaders know exactly what needs to be done, better talent management, clearer research pathways, structural reform, but few are brave enough to act decisively while in office. Only after completing their terms do some begin to speak out, by which time the opportunity to effect meaningful change has passed. Without leadership that is willing to take calculated risks, champion difficult reforms, and actively empower the research community, Malaysia’s chemical research landscape will remain underpowered, rich in potential, but stuck in perpetual underachievement.

### 4. A Culture of Silence and Siloes

Following the absence of bold leadership and structural support,

another critical barrier emerges: a fragmented and insular research culture. Despite the existence of numerous national platforms, scientific societies, and ministerial initiatives, Malaysia’s research landscape remains highly siloed and disconnected, both within and across institutions. Researchers often operate in isolation, even in adjacent labs or departments. Collaboration is more incidental than intentional, and resource-sharing is rarely institutionalised. This leads to duplicated purchases, redundant projects, and overlapping grant proposals, all of which waste valuable time, funding, and effort. The issue is particularly acute in chemical research, which by nature requires interdisciplinary expertise, large-scale instrumentation, and cross-institutional access to specialised facilities. Yet, meaningful collaboration across universities is still the exception rather than the norm. Competition remains the dominant mode, especially when performance metrics and funding are tied to institutional rankings and internal politics. Even when researchers share common scientific goals, the lack of a national collaboration framework makes it difficult to pool expertise or jointly pursue high-impact projects. Equally worrying is the low engagement with professional societies or interdisciplinary conferences. Many researchers see such platforms as formalities or prestige markers, rather than as spaces to forge real partnerships or shape scientific direction. This passivity contributes to a culture of silence, where innovative ideas are not exchanged, challenges are not discussed openly, and collective problem-solving is rare. Some fields often working on near-identical themes without knowing or acknowledging each other’s existence. While diversity of interest is healthy, the lack of coordination results in diluted impact and fragmented narratives. Malaysia ends up with many promising fragments, but no unified voice to influence global discourse or policy direction. This siloed culture, coupled with leadership inertia and infrastructural decay, creates an ecosystem that stifles synergy and isolates talent. Science thrives on dialogue, openness, and shared ambition, qualities that must be cultivated, not assumed.

### 5. Reward and Punishment

Malaysian academia operates within a top-heavy, KPI-driven system that often prioritises the appearance of productivity over meaningful scientific contribution. In such an environment, quantity frequently trumps quality. Academics are evaluated and rewarded for publishing more papers, regardless of their actual novelty, impact, or reproducibility. This model encourages the practice of “salami slicing”, the fragmentation of data into multiple low-impact papers to inflate publication counts. Meanwhile, substantial, integrative work that could contribute to high-impact journals or meaningful technological breakthroughs is deprioritised because it demands more time, effort, and risk. In chemical research, where experiments are labour-intensive, instrumentation-dependent, and often long-term, this pressure to publish quickly undermines the very nature of the work. At the same time, the system exhibits a lack of consequence for non-performance. Academics who consistently underdeliver or disengage from research responsibilities often face no clear accountability. This imbalance creates a culture where high-performing researchers feel penalised, while underperformers continue unchallenged. Over time, this breeds disillusionment,



burnout, and resignation among those who care deeply about research integrity and national advancement. The appraisal and promotion frameworks rarely reward long-gestation, high-risk projects, nor do they recognise failure with scientific value, such as null results or negative data that may still contribute to knowledge. Open science practices, replication studies, and data transparency are also overlooked, despite their global importance. Likewise, contributions that directly benefit national priorities or community needs are often undervalued compared to journal metrics. In many institutions, research excellence is reduced to bureaucratic checklists, divorced from any real evaluation of the science itself. As a result, young researchers are often trained to “play the system” rather than to innovate. The deeper goal of building Malaysia’s scientific reputation, regionally or globally, is lost in the race to meet yearly quotas. In a field like chemistry, which demands precision, integrity, and depth, this misaligned reward structure does not just distort behavior, it fundamentally devalues the discipline.

## 6. Human Capital

Malaysia is home to a wealth of talented chemistry graduates, individuals trained with rigor, curiosity, and a genuine passion for science. Yet, too many of these bright minds are being lost to the system. Without sustained institutional support and clear career pathways, many end up leaving academia altogether, pivoting into unrelated industries, or migrating overseas in search of better prospects. This brain drain is not due to a lack of ability, but a result of systemic neglect. Postdoctoral positions, often a vital bridge to academic independence, are scarce, inconsistently funded, and offer salaries that are far from competitive. Benefits are minimal, contracts are short, and long-term prospects are uncertain. Those who do manage to enter academia frequently find themselves in precarious positions as contract lecturers, with unclear promotion tracks, limited research time, and few opportunities for professional growth. Compounding this is the lack of structured training in emerging interdisciplinary domains that are reshaping global chemical research. Fields such as chemoinformatics, data visualisation, computational modelling, and green chemistry policy remain underrepresented in most postgraduate programmes. Without exposure to these frontiers, many young researchers are poorly equipped to contribute to, or lead, Malaysia’s next wave of scientific innovation. The consequences of this are far-reaching. Not only do we lose individuals who might have become future scientific leaders, but we also erode the very foundation of a sustainable research ecosystem. When human capital is underdeveloped and underutilised, the long-term competitiveness of the nation suffers, not because we lack talent, but because we fail to nurture it.

## 7. Translational Research

Despite decades of public investment and thousands of academic publications, Malaysia continues to struggle with translating laboratory discoveries into real-world applications. Nowhere is this more evident than in the chemical sciences, where promising breakthroughs routinely stall at the prototype stage, never progressing to viable products, services, or policy solutions. At the heart of the problem lies a deep disconnect between academia and industry. While researchers are under

pressure to publish and fulfil academic KPIs, their outputs are often divorced from practical needs. As a result, universities end up developing “solutions” for problems that don’t exist, products that are technically sound but commercially irrelevant. From the industry’s perspective, academia is frequently seen as too slow, bureaucratic, and misaligned with market dynamics, while researchers, in turn, view industry as uninterested in basic science and overly profit-driven. This mutual mistrust is worsened by the lack of robust mechanisms to bridge the research-to-market divide. There is little structural support for scaling up lab-scale discoveries, particularly the critical leap from Technology Readiness Level (TRL) 3 to TRL 6, where feasibility testing, prototyping, and real-world validation are required. Without translational infrastructure, pilot plants, regulatory advisory, IP and market-readiness coaching, most chemical innovations never leave the lab. The situation is further complicated by limited venture capital interest in chemical technologies, which typically involve longer development timelines, complex safety considerations, and high technical risk. Unlike software or digital startups, chemical innovations demand more time, more regulation, and more capital. As a result, many potentially transformative discoveries in some areas are abandoned, not for lack of potential, but for lack of support. The consequence is a vicious cycle of disillusionment. Researchers pour years into developing technologies that go nowhere. Industry remains disengaged. And public funds are spent with little return in terms of national impact or innovation outcomes. Until Malaysia builds a coherent translational research ecosystem, with clear incentives, shared priorities, and supportive policy instruments, its chemical research community will remain stuck between discovery and delivery.

## Conclusion

Malaysia’s chemical research ecosystem does not suffer from a lack of talent, ambition, or ideas, but from a persistent failure to execute, sustain, and lead with conviction. Decades of experience, both from within today’s academic frontlines and from those who helped build the system from its earliest days, point to the same hard truth: we know what’s broken, but we have yet to find the courage to fix it. To move forward, we must stop mistaking activity for progress. Piecemeal efforts, cosmetic reforms, and checklist-driven performance metrics will not build the future we need. What’s required is a deliberate and coordinated transformation, one that aligns funding with purpose, empowers knowledgeable leadership, dismantles unnecessary bureaucracy, and restores time and space for deep scientific work. Collaboration must become more than a tagline. It must be institutionalised, resourced, and led with continuity and vision. Our existing structures and societies can serve as powerful platforms, but only if they are given the mandate and momentum to lead. Human capital must be cultivated, not just recruited. And research must be recognised not by how quickly it publishes, but by how meaningfully it contributes. Malaysia cannot afford to merely aspire. We must commit, with integrity, with structure, and with the collective will to do what’s difficult. The future of chemical science in this country depends not on ambition alone, but on our readiness to turn that ambition into action.





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## 22nd FACS General Assembly and 20th Asian Chemical Congress (ACC2025)

### 1. Introduction

The 22nd General Assembly of the Federation of Asian Chemical Societies (FACS) and the 20th Asian Chemical Congress (ACC2025) were successfully held from 22 to 27 June 2025 at The Berkeley Hotel, Pratunam, Bangkok. Hosted by the Chemical Society of Thailand, this prestigious biennial event brought together over 900 participants — 342 from overseas and 594 from Thailand — comprising chemical scientists, researchers, academics, industrial professionals, and policy makers from 41 countries. Malaysia's participation was represented exclusively by a delegation from Institut Kimia Malaysia (IKM), consisting of Datuk ChM Dr. Soon Ting Kueh, IKM President; Prof. Dr. Juan Joon Ching, Assistant Honorary Secretary; and Dr. Malarvili Ramalingam, Honorary Treasurer. Both Prof. Dr. Juan and Dr. Malarvili were also invited speakers at the Congress, presenting on topics aligned with their expertise, current professional roles and responsibilities.

The Congress, themed “Responsible Chemical Sciences for World Sustainability,” highlighted the crucial role of chemical sciences in advancing the United Nations Sustainable Development Goals (SDGs).

### 2. 22nd General Assembly of FACS (22 June 2025)

#### 2.1 Overview

The FACS General Assembly convened on 22 June, attended by official delegates from member societies. It served as a strategic platform to discuss ongoing initiatives, review reports, elect new executive members, and chart the future course of FACS.

#### 2.2 Proceedings

Presided by outgoing FACS President Prof. Mustafa Çulha and the Honorary General Secretary, the meeting opened with



welcome remarks and country presentations showcasing significant achievements in chemical education, research, and public outreach.

Key highlights included:

- Tabling and acceptance of FACS reports and budget updates.
- Elections for the 2025–2027 Executive Committee.
- Strategic reviews on enhancing student engagement, supporting emerging societies, and fostering regional research collaborations.

#### 2.3 Key Outcomes

- Appointment of Prof. Dr. Supa Hannongbua (Thailand) as the new FACS President and Prof. Dr. Supakorn Boonyuen (Thailand) as Secretary-General.
- Malaysia was officially endorsed as the host of the 21st Asian Chemical Congress (ACC) in 2027, with Prof. Dr. Juan Joon







- Plenary, keynote and invited lectures by renowned scientists, including the 2004 Nobel Prof. Dr. Aaron Ciechanover.
- Regular sessions covering topics such as Inorganic Chemistry, Materials Science and Nanotechnology, Analytical Chemistry, Polymers and Bio-based Materials, Natural Products, Biological Chemistry and Chemical Biology, Organic Synthesis and Medicinal Chemistry, Food, Agriculture, and Cosmetics, Industrial and Engineering Chemistry, Chemistry for Energy and Environment, Physical and Theoretical Chemistry and Future in Chemical Education.
- Special session which includes TU-Frontier Lab-JEOL joint session Contaminants of Emerging Concern: PFAS & Microplastics; Sustainable chemistry Focusing on Clean energy Good Health and Well-Being (Thailand-Taiwan); AI in Drug Discovery Research; IMS-CU bilateral symposium for driving forward frontier research; and Unlocking the Power of Nature: Cutting-Edge Applications of Natural Products, Biological Chemistry, and Chemical Biology.
- Side-Event encompassing Science Projects for Students Showcase and Future Chemistry Research Presentation for High School Students (only poster)
- Poster sessions for young researchers and students, and exhibitions from industries and academic publishers.

The Congress was hosted by the Chemical Society of Thailand, with Prof. Dr. Supa Hannongbua serving as Chair of the Organizing Committee. During the opening ceremony, Prof. Dr. Supa, in her dual role as President of FACS and Congress Chair, and Prof. Dr. Mustafa Çulha, former President of FACS, delivered inspiring speeches to officiate the event.

### 3.2 Awards and Recognitions

The Congress also saw the conferment of several prestigious FACS and partner awards, recognising excellence in chemical sciences:

#### FACS & Partner Awards:

- *Bulletin of the Chemical Society of Japan (BCSJ) Award*
- *Chemistry Letters Young Researcher Awards*
- *RSC Advances Poster Prize Awards*
- *Oral Presentation Awards*
- *Poster Presentation Award*
- FACS Distinguished Lectureship Award
- *Prof. Zhiyong Tang (PL2)*
- FACS Young Chemist Award in Analytical Chemistry

Ching announced as the FACS President-Elect and Dr. Malarvili Ramalingam as the Secretary General-Elect,

- Strengthening of the FACS Young Chemists Network (FYC) and regional training programs.
- Initiatives to enhance the Federation's visibility through digital platforms and regional activities.

### 3. 20th Asian Chemical Congress (23–27 June 2025)

#### 3.1 Scientific Programme

- ACC2025 featured an intensive five-day programme including:





- *Asst. Prof. Dr. Itthipon Jeerapan (Analytical Chemistry)*  
FACS Award for Distinguished Contribution to Economic Development
- *Dr. Han-Oh Park: Sustainable Chemistry for Agricultural Residue Valorization*  
FACS Award in Chemical Education
- *Prof. Mustafa Sözbilir: Future in Chemical Education*  
FACS Citations
- *Prof. Mary Garson: Young Career Development Session*
- *Prof. Long-Kang Liu: Inorganic Chemistry*

#### 4. Cultural and Social Highlights

Delegates enjoyed a warm Thai welcome through the cultural showcase during the welcome reception and gala dinner. These events offered valuable opportunities for informal networking, cultural exchange, and strengthening of regional ties.

#### 5. Closing Ceremony and Flag Handover

The Congress concluded on 27 June 2025 with a memorable closing ceremony, which included the presentation of Oral

and Poster Awards to outstanding contributors. A key highlight of the event was the FACS Flag Transfer Ceremony, symbolising the handover of responsibilities for the next Congress to Institut Kimia Malaysia (IKM), the official host of the 21st Asian Chemical Congress (ACC2027). Earlier during the General Assembly in 2023, Datuk ChM Dr. Soon Ting Kueh, representing IKM, successfully secured Malaysia's bid to host ACC2027.

The upcoming Congress in 2027 will hold special significance for IKM, as it will also mark the 60th Anniversary of the institution—an occasion that promises to celebrate both scientific excellence and the enduring legacy of IKM in advancing the chemical sciences.

#### 6. Conclusion

ACC2025 and the 22nd FACS General Assembly have set a new benchmark in fostering scientific excellence, regional collaboration, and policy dialogue in the chemical sciences. The event underscored the commitment of Asian chemical communities to work collectively toward a more sustainable future. IKM looks forward to welcoming the region's scientific community to Malaysia in 2027 for another impactful gathering.



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# Reframing Polymer Chemistry Education in Malaysia in the Context of Evolving Public Perceptions of Plastics: A Perspective

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## Abstract

This perspective article explores the pedagogical implications of growing anti-plastic campaign on the teaching and learning of polymer chemistry in Malaysia. Amid heightened public discourse linking plastics with environmental problems, undergraduate students increasingly enter classrooms with common beliefs that affect engagement and perception of the discipline. This paper identifies these perceptual barriers, outlines contextually relevant teaching strategies, and advocates for a reorientation of polymer education toward sustainability. We argue that this tension presents not only a challenge but also a timely opportunity to nurture a generation of polymer educators who are both scientifically competent and environmentally conscious.

**Keywords:** *polymer chemistry education, Malaysia, anti-plastic campaign, sustainability, green chemistry, undergraduate teaching*

## Introduction

Polymer chemistry remains a cornerstone of modern materials science, underpinning innovations in fields as diverse as packaging, electronics, automotive engineering, biotechnology, medical sciences, agriculture, and renewable energy. The ubiquitous nature of polymer-based materials reflects their versatility and adaptability. However, this scientific success has been met with increasing environmental scrutiny, particularly in Malaysia and other rapidly developing nations facing the dual pressures of industrial growth and environmental sustainability [1]. Malaysia, known for its petrochemical industry and its role as a regional hub for plastic manufacturing, has also become a focal point in discussions about plastic waste, marine pollution, and sustainable development [2]. This tension between industrial relevance and environmental impact has found its way into the classroom, where polymer chemistry—an already abstract and challenging topic—now carries social and ethical baggage. Undergraduate students often enter chemistry programs with preconceived beliefs shaped by anti-plastic media campaigns and governmental policies promoting plastics [3-4]. This article explores these evolving perceptions and their impact on teaching and learning in universities. It also proposes pedagogical interventions aimed at reframing polymer education in a more balanced and constructive light.

## The Emerging Pedagogical Challenge

Public campaigns promoting plastic reduction have achieved much in raising awareness about the environmental consequences of plastic waste. However, these campaigns at times present a simplistic, monolithic view of plastics, lacking clarity in distinguishing between different types of

polymers, their functions, and the complex factors influencing waste management [5]. This oversimplified messaging can inadvertently stigmatize the entire discipline of polymer science. Polymer educators may find increasing difficulty in motivating students during polymer-related modules. Some students express concern about the moral legitimacy of studying or working in a field that they perceive as environmentally damaging. Others lose interest entirely, failing to see the relevance of polymer science in a future where they believe plastics will become obsolete [4, 6, 7]. These challenges are compounded by the inherently abstract and interdisciplinary nature of polymer chemistry itself, which requires knowledge in organic synthesis, thermodynamics, material science, and analytical techniques. A combination of reduced receptiveness and cognitive load may result in a less conducive learning environment, especially among students with insufficient grounding in basic chemistry concepts.

## Contextual Teaching Approaches

To navigate these barriers, polymer chemistry educators must adopt innovative, context-sensitive strategies that align with both educational goals and broader sustainability imperatives. The following approaches are worth considering:

### *Integrating Green Chemistry and Sustainability Frameworks*

Embedding the principles of green chemistry and sustainable design within the curriculum is no longer optional. Students must be taught that polymer science is not antithetical to sustainability but can in fact drive environmental solutions [8-10, 11]. This includes exposing students to concepts such as:

- Biodegradable polymers and compostable materials
- Life cycle assessment (LCA)
- Recycling technologies and upcycling strategies
- Renewable feedstocks for polymer synthesis

Courses can be restructured to culminate in student-led projects focused on developing greener alternatives to conventional polymers, fostering both critical thinking and creativity.

### *Myth-Busting and Scientific Communication*

Early in the course, instructors should dedicate time to addressing clear conceptions about plastics. A discussion-based session can differentiate between types of plastics (thermoplastics vs. thermosets, single-use vs. durable polymers) and explain that problems arise more from misuse and poor policy than from the material itself. This also offers an opportunity to discuss how misinformation spreads and



how scientists can act as public educators [12-13].

### ***Incorporating Local and Regional Innovations***

Students are more likely to appreciate polymer chemistry when they see its relevance to their own society [14-15]. Educators can introduce case studies from Malaysia and Southeast Asia, such as:

- Palm oil-based polyols used in polyurethane foams
- Cassava- or sago-based bioplastics
- Research on plastic pyrolysis for fuel recovery

Highlighting regional research efforts not only builds pride in local innovation but also counteracts narratives that associate plastics only with environmental harm.

### ***Interdisciplinary and Stakeholder Engagement***

Inviting professionals from industry, environmental NGOs, and government agencies to speak with students can present a more balanced and nuanced picture of the issues. These interactions allow students to hear diverse perspectives, ask critical questions, and consider career paths that integrate polymer chemistry with sustainability [16-17]

### ***Visual Tools and Active Learning***

Given the abstract nature of macromolecules and polymerization mechanisms, the use of visual simulations, modelling kits, and virtual labs can make concepts more tangible. Problem-based learning, flipped classrooms, and design thinking challenges are particularly effective in engaging millennial and Gen Z learners [18-21].

### ***Addressing Curriculum and Policy Gaps***

Curriculum reform is essential to ensure polymer chemistry education remains current and aligned with societal expectations [22]. Malaysian universities may consider:

- Offering electives in Sustainable Materials Chemistry or Sustainable Polymers
- Integrating polymer modules into interdisciplinary programs such as environmental science, food technology, or textile science
- Encouraging final-year projects or internships focused on circular economy initiatives.

Furthermore, national education policies should recognize the evolving role of chemistry in sustainable development. Institutional support is needed for training educators in green pedagogy, developing localized teaching materials, and fostering research in sustainable polymers [23-25].

### ***Embracing the Opportunity***

Rather than viewing the rise of anti-plastic campaign as a threat, educators can embrace this moment as an inflection point. The controversy surrounding plastics offers a powerful entryway for critical discussions, ethical reflection, and societal relevance. Polymer chemistry, when taught within a sustainability framework, can become a vehicle for

inspiring students to innovate responsibly. By positioning students not merely as passive learners but as future solution providers, we can cultivate a generation of polymer scientists who are technically proficient and socially conscious. This reframing aligns with the evolving vision of Malaysian education, which seeks to produce graduates who are global citizens capable of addressing complex challenges [26].

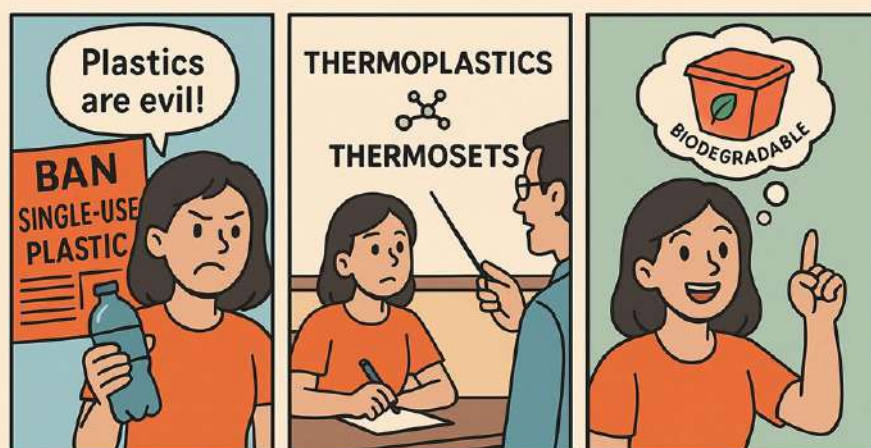
### ***Conclusion***

Polymer chemistry education in Malaysia is undergoing a period of transition — balancing its rich legacy of innovation with the need to address growing environmental considerations. The tension between these forces demands a pedagogical response that is both scientifically rigorous and socially responsive. Through curricular reform, inclusive dialogue, and a commitment to sustainability, educators can reposition polymer chemistry as a forward-looking discipline essential to addressing the very problems it is often accused of creating. The result will be a more engaged student body, a more resilient curriculum, and a more informed public understanding of science.

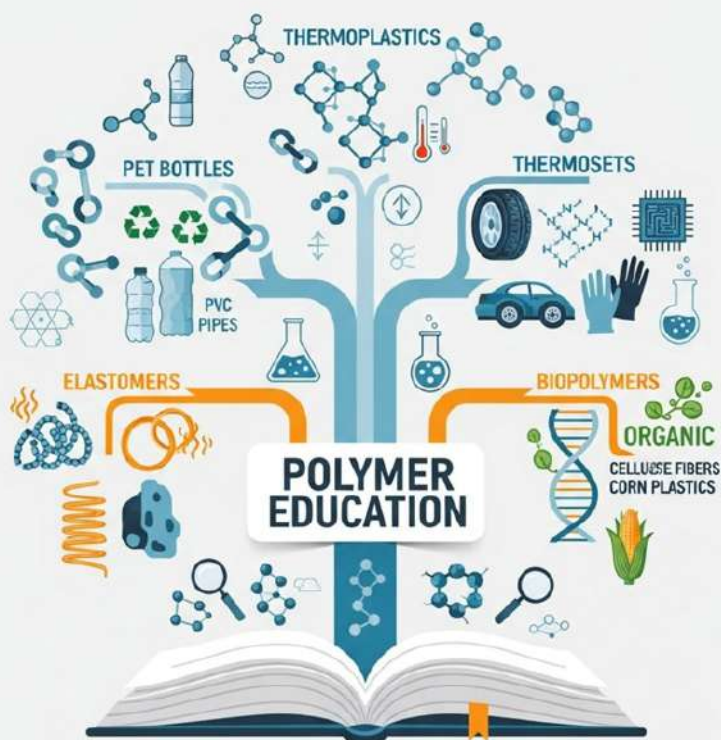
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## From Emissions to Solutions: CCDCU Technical Visit Showcases CO<sub>2</sub> Innovation at Sunway University

Mohd Azlan Kassim, Azizul Hakim Lahuri, Phang Sook Wai

On 20<sup>th</sup> June 2025, the Centre for Carbon Dioxide Capture and Utilisation (CCDCU) at Sunway University welcomed members and chairperson (Prof. ChM. Dr. Phang Sook Wai) of the Division for Physical and Theoretical Chemistry, IKM for an exclusive technical visit themed “From Emissions to Solutions: Exploring CO<sub>2</sub> Capture and Utilisation at Sunway University.” The visit was led by ChM Dr Mohd Azlan Kassim and ChM Dr Azizul Hakim Lahuri to provide participants with a first-hand look at the centre’s pioneering research, advanced facilities, and collaborative projects aimed at tackling one of the most pressing challenges of our time—*climate change*. The event served a dual purpose: to introduce the public, and specifically IKM members, to the research conducted at CCDCU, and to profile Sunway University’s extensive research capabilities.

This technical visit was a direct reflection of Sunway University’s mission to be a leader in carbon capture and utilisation (CCU) research. CCDCU’s work focuses not only on advancing scientific understanding of CO<sub>2</sub> capture technologies but also on converting emissions into valuable products that can be integrated into the economy. Through live demonstrations, technical discussions, and networking opportunities, the event underscored the university’s commitment to knowledge transfer and industry collaboration. The focus on transforming CO<sub>2</sub> from a waste product into a resource aligns with several United Nations Sustainable Development Goals, particularly affordable clean energy (SDG 7), industry innovation and infrastructure (SDG 9), responsible consumption and production (SDG 12), and climate action (SDG 13). The visit was organised by the DPTC under IKM in collaboration with CCDCU. This partnership reflects a shared commitment to advancing Malaysia’s capacity in green technology research and bridging the gap between laboratory innovation and real-world implementation. The highlight of the morning session was the keynote presentation by Prof. Mohamed Kheireddine Aroua, Head and Distinguished Professor at CCDCU, Faculty of Engineering and Technology, Sunway University. Prof. Aroua is an internationally recognised authority in CO<sub>2</sub> capture and utilisation, with more than 30 years of experience in physical chemistry, separation processes, and sustainable engineering. Prof. Aroua’s keynote, “Introduction to CO<sub>2</sub> Research,” set the tone for the visit. The presentation began with an overview of the climate crisis,

emphasising CO<sub>2</sub>’s role as the leading greenhouse gas and the importance of CCU even in a fully renewable energy future. He detailed the science behind CO<sub>2</sub> capture, explaining the fundamentals of amine-based absorption/desorption processes, thermodynamics, and reaction kinetics. The audience gained insights into speciation chemistry, mass transfer processes, and the engineering challenges of scaling up capture systems while reducing cost and energy intensity. Participants were particularly engaged by the presentation of recent research breakthroughs, including the long-term stability of waste-derived adsorbents, successful patent applications, and high-TRL (Technology Readiness Level) prototypes ready for industrial testing. The visit attracted approximately 35 participants from academia, industry, and research organisations. Academic attendees included representatives from UM, UKM, UPM, and Tunku Abdul Rahman University of Management and Technology (TARUMT). From industry, Pantherlab Sdn Bhd and PETRONAS added commercial perspectives, while specialised research entities such as NANOCAT and FMLS enriched discussions with their technical expertise. The mix of seasoned researchers, industry practitioners, and enthusiastic students created an environment conducive to meaningful knowledge exchange. Following the keynote, participants embarked on a structured lab tour designed to offer a comprehensive look at Sunway University’s research capabilities. Attendees were divided into three groups, rotating between key research centres: Centre for Carbon Dioxide Capture and Utilisation (CCDCU), Research Centre for Nano-Materials and Energy Technology (RCNMET) and Sunway Centre for Electrochemical Energy and Sustainable Technology (SCEEST).

This tour allowed participants to witness first-hand the breadth of Sunway University’s instrumentation, supporting research from fundamental science to applied technology development. The final segment of the programme included a Q&A session and informal networking. Discussions covered potential research collaborations, student training opportunities, and pathways for scaling up laboratory innovations to industrial scale. Several participants expressed interest in joint grant applications and technology trials, demonstrating the event’s success in fostering new professional connections. The CCDCU Technical Visit achieved its goal of introducing IKM members to Sunway University’s leadership in CO<sub>2</sub> capture and utilisation research. Beyond technical knowledge, participants left with a deeper appreciation of how interdisciplinary collaboration and innovative thinking can drive solutions to global environmental challenges.







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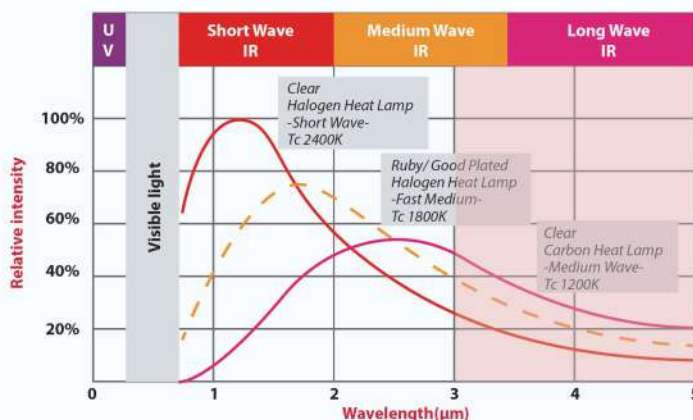
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Muhammad Nurhakimie Bin Roslan, ChM L/3888/11395/25	Amelia A/K Jacob, ChM M/7140/9739/22/25	
Muhammad Ridhwan Bin Mohd Nasir, ChM L/3873/11335/25	Johnson Lee Tian Qing, ChM M/7137/10312/23/25	
Muhammad Shamirul Bin Khairul Lail, ChM L/3895/11435/25	Norulhuda Binti Yusof, ChM M/7136/6595/13/25	
Nazrul Bin Mohammad Hamdi, ChM L/3875/11344/25	Nur Izzah Atirah Binti Rose Man, ChM M/7143/9220/21/25	
Noor Fazleen Binti Mohamad Fauzi, ChM L/3883/11363/25	Nur Sabrina Binti Mohd Nooh, ChM M/7142/10175/23/25	
Nornatasafaziana Binti Mohd Zulkifly, ChM L/3870/11218/25	Nurin Lammert Binti Mohd Adlan Lammert, ChM M/7134/8744/20/25	
Nur Amira Aqilah Binti Sulaiman, ChM L/3892/11425/25	Nurul Afifah Binti Azlyzan, ChM M/7141/10543/24/25	
Nur Husna Izzati binti Shafeai, ChM L/3887/11384/25	Sharon Ng Ee Lynn, ChM M/7135/6301/12/25	
Nur Izzati Binti Mohd Idris, ChM L/3872/11332/25	Teoh Jay Kee, ChM M/7138/9639/22/25	
Nur Nadia Adha Binti Mohd Yusof, ChM L/3882/11362/25		
Nurul Alina Binti Muhamad Suhaini, ChM L/3897/11438/25		





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