Induction of 86th President and Annual Dinner of the Institute of Chemistry

Message from the 86th President

Chemical Science for Technological Advancement: Empowering the Future

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"Technology is a gift of God. After the gift of Life, it is perhaps the greatest of God's gifts. It is the mother of civilization of Arts and of Sciences. Technology continues to grow to liberate mankind from the constraints of the past. The most revolutionary aspect of technology is its mobility. Anybody can learn it. It jumps easily over barriers of race and language. And its mobility is still increasing."

Prof. Freeman J. Dyson,
Institute of Advanced Studies, Princeton, USA.

The global middle class is expected to grow approximately by a factor of three by 2023 as compared to the situation in 2009. Much of this would occur in developing countries where 70% of global economic activity will emerge by 2050. This growth would require a significant demand for various resources, especially, energy, infrastructure and consumer goods, which will be a challenge to be faced by the society. Science and technology would be able to provide solutions for these challenges. In fact "science and technology" are key drivers to development, because technological and scientific revolutions support economic advances, and improvements in health systems, education and infrastructure. The inherent mobile nature of science and technology has become the major revolutionary aspect to provide solutions for the issues of ever-changing dynamic world. For instance, technological revolutions of the 21st century, with digital revolution, are emerging from many sectors; namely, micro-processors, telecommunications, biotechnology, nanotechnology, quantum computing, etc.

Advanced technology has enabled chemical manufacturers to undertake many aspects; production of new types of material with unique and desirable characteristics, automation of industrial processes, reduction of pollution aspects through cleaner production and improvement of safety standards are some examples. Chemical technology is an ever expanding industry, and chemistry being the central science, chemical technologists collaborate with other scientists to solve global problems in diversified areas, such as climate change, production of new drugs, and even improvement of life expectancy of humans.

The International Union of Pure and Applied Chemistry (IUPAC), having identified the role of chemical science in finding and implementing innovative solutions that enable a more sustainable future. It has identified 'Top Ten Emerging Technologies in Chemistry 2022', as listed below:

- Aerogels
- Fibre batteries
- Film-based fluorescent sensors
- Liquid solar fuel synthesis
- Nanoparticle mega libraries
- Nanozymes
- Rational vaccines with spherical nucleic acids (SNAs)
- Sodium-ion batteries
- Textile displays
- Virtual reality (VR)-enable interactive modeling

These top technologies are connected to the

transition to a green economy and a more sustainable world, in line with the United Nations' Sustainable Development Goals (SDGs). More importantly, these technologies lead to productive use of resources, favour more efficient transformations, and provide more sustainable solutions, leading to future applications in energy sector, sensing technology on earth and space, clinical and medical technology, and so on.

The Institute of Chemistry Ceylon (IChemC) should therefore expand its activities contributing to technological advancement from the point of chemical science, thereby empowering the future, as per its Vision: "To uplift the quality of life for a better world through the advancement of Chemical Sciences"; and Mission: "To be the center of excellence in Chemical Sciences for the socio-economic development through education, research and innovation". Strengthening the IChemC through human resource development, infrastructure development, development of new academic programmes and quality control of academic programmes shall be some initial steps necessary in this regard. The content of the 2nd international conference on Frontiers in Chemical Technology (FCT) to be held in June 2024 will also be parallel to the top 10 technologies of IUPAC and global sustainable development goals. This conference is sub-themed under eight multidisciplinary topics:

- Energy: Chemistry, Technology and Engineering
- Food: Security, Safety and Quality
- Environment: Science, Technology and Green Chemistry
- Industry: Challenges and Advances
- Measurements: Data Processing and Sensing
- Medicine: Chemistry and Pharmaceutical Technology
- Separations: Processes and Technological Advances
- Waste: Management, Value Addition and Circular Economy

Another aspect to be considered is changes of human lifestyle and human requirements in the digital era we live. The digital revolution continues to reshape industries across the globe, and further acceleration of the digital transformation would soon happen. Industry 4.0 technologies, such as artificial intelligence (AI), machine learning, big data analytics, and the Internet of Things (IoT), will enable the chemist to optimize processes, further improve the sensitivity of detection of analytes, improve efficiency of cleaner production, and arrive at data-driven decisions. Advanced simulation tools would also enhance process design, allowing for virtual testing and optimization of chemical processes, demonstrating the vital nature of chemical science technological advancement.

Prof. Namal Priyantha *obtained his BSc Honours in Chemistry from the University of Peradeniya, Sri Lanka in 1982, followed by a PhD in 1990 from the University of Hawaii in USA. His research interests include the construction of low-cost electrodes for field measurements, Treatment of industrial effluents, electrochemical sensors and electrochemical detection of pesticides. He served as a senior Lecturer at the University of Peradeniya, from 1993 to 2001, and a visiting lecturer at many universities in Sri Lanka, including the College of Chemical Sciences, Institute of Chemistry Ceylon. Prof. Namal Priyantha currently serves as a Senior Professor at the Department of Chemistry, University of Peradeniya*

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The September issue of Chemistry in Sri Lanka of the year 2023 is dedicated to the theme of the year 2023 – 2024 "Chemical Science for Technological Advancement: Empowering the Future". Coconut shell based activated carbon is one of the industries earning foreign exchange for Sri Lanka. They achieved technological advancement that made it easy to synthesize activated carbon at a low cost, making it an attractive tool for remedial applications in fertilizer, vehicle, petroleum, pharmaceutical, cosmetic, and textile industries among many others. (*image: www.freepik.com*)