Introduction of MICS

In March 2003, Mitsui Chemicals hosted a professional forum called the First Mitsui Chemicals International Symposium on Catalysis Science (MICS2003) under the theme: “Advanced Catalysts for Polymers” which 10 world-renowned speakers participated in. In addition to promote a concept and direction of catalysts for a new age through active exchanges of ideas as well as personal interfacing among the speakers and a large number of participants, it was also to commemorate the opening of the new Mitsui Chemicals Catalysis Science Laboratory (CSL) in April 2002.

In March 2005, the Second Mitsui Chemicals International Symposium on Catalysis Science (MICS2005) under the theme: “Green Catalysts for Specialty Chemicals” was held. Fully leveraging on the domestic and international network of scientists it has built up over the years Mitsui Chemicals not only managed to invite world-renowned speakers but also 2001 Nobel Laureate Professor K. Barry Sharpless as well as 2005 Nobel Laureate Professor R. R. Schrock. The “Mitsui Chemicals Catalysis Science Award” and the “Mitsui Chemicals Catalysis Science Award of Encouragement” were also set up to recognize researchers who have made distinguished achievements in catalysis science and at the same time contributing to the sustainable development of chemistry and the chemical industry.

The successes of the MICS2003 and MICS 2005 had led once again to the high profile Third Mitsui Chemicals International Symposium on Catalysis Science (MICS2007) under the theme “Polymerization Catalysis - Current Status and Future Prospects” held in March 2007. This time, the symposium not only had world-renowned speakers but also had the privilege of the attendance of 3 Nobel Laureates. Planetary lectures were given by 1987 Nobel Laureate Prof. J.-M. Lehn as well as 2005 Nobel Laureates, Professor R. R. Schrock and Professor R. H. Grubbs. It was very generous of Mitsui Chemicals to award travel stipends to 3 National University of Singapore (NUS) undergraduates to attend MICS2007. They were Lau Chau Sang, Jian Mingxian and Sim Siang Tze Victor.

To show our gratitude, the three of us have come up with this report of MICS 2007. The following sections will be a summary of the lectures in MICS2007 as well as the cultural exchange that followed from these generous travel stipends that Mitsui Chemicals has sponsored.
Summary of MICS 2007

There were a total of eleven lectures in the course of the two-day symposium. The lectures covered a diverse area of various kinds of research by renowned scientists from all over the world. From the lecture on “The development and use of modern olefin metathesis catalysts for organic and polymer chemistry” by Professor Robert H. Grubbs to the lecture titled “Discovery and development of FI catalysts for olefin polymerization by: Unique catalysis and distinct polymer formation” by Professor Terunori Fujita, all the speakers have captured our attention with the revolutionary ideas that they have proposed. In this report we have chosen to write about the lecture by the Nobel Prize Laureate, Jean-Marie Lehn, that left the greatest impression on us.

Plenary lectures
Speaker: Jean-Marie Lehn
Title of lecture: From Supramolecular Chemistry to Constitutional Dynamic Chemistry

Supramolecular chemistry is currently looking into systems that self-organize into well-defined functional structures based on the molecular information stored in the covalent framework of the components. The behaviour is known as a programmed chemical system as the information is processed through specific interactional algorithms. Supramolecular chemistry is a dynamic chemistry since the interactions concerning the molecular components are labile and the covalent bonds that may form and break are reversible, allowing a continuous change in constitution by reorganization and the exchange of blocks within the molecule. These properties lead to a Constitutional Dynamic Chemistry (CDC) on molecular and supramolecular levels.

CDC introduces a fundamental change with respect to constitutionally static chemistry. Contrary to the latter that produces a target entity by design, CDC allows variation and selection through dynamic diversity. The combination of the properties: information and programmability, dynamics and reversibility, constitution and structural diversity, give rise to a form of adaptive and evolutive chemistry, which is similar in concept to the Darwinian evolution of organisms since the molecule can now adapt to the environment it is in. By introducing self-organization by design, we can programme and exert control over the supramolecular entity. This offers an powerful complement to nano-fabrication or nano-manipulation of materials. Another application of this field of chemistry would be the synthesis of strong, flexible dynamer film (Dynasil) that is water-disintegrative and therefore friendly to the environment. The research in this area is conducted currently under collaboration with Mitsui Chemicals.

Cultural Exchange

Besides the academic exchange, the MISC symposium offered us a chance to interact with the Japanese and gain a better understanding of the Japanese culture and way of life. The section on the cultural exchange is found in the following link. Photos and interesting commentaries on our adventure in Japan can be found in the two links below.

http://www.travelblog.org/Asia/Japan/Tokyo/blog-141774.html
http://www.travelblog.org/Asia/Japan/Kamakura/blog-142029.html
Photos taken during the symposium
We had the honour of meeting many renowned scientists during the dinner banquet of the symposium. Below are two of the photos we took with the Nobel Prize Laureates of 2005, Professor Richard R. Grubbs and Professor R. R. Schrock. We also had the privilege of conversing with them.

Photo with 2005 Nobel Prize Laureate in Chemistry Professor Richard R. Grubbs

Photo with 2005 Nobel Prize Laureate in Chemistry Professor R. R. Schrock

More photos taken at the symposium can be found at the following link http://www.travelblog.org/Asia/Japan/Chiba/blog-141644.html

To sum up, this has been a very fruitful trip where we have not only gained knowledge in catalysis science, but enjoyed the warm hospitality of the Japanese people and experienced the rich culture of Japan. On behalf of the applied chemistry department, we would like to extend our gratitude to Mitsui chemicals. We hope to continue to engage ourselves academically and look forward to future collaboration in the area of research with Mitsui Chemicals.

Report written by: Jian Mingxian
Sim Siang Tze Victor
Lau Chau Sang