

PoDiv101: A Brief Guide to the Polymer Division



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When all is said and done, the IUPAC Polymer Division is a group of people. So here we all are, well, a good number of us anyway.

This photo above was taken at our most recent get-together, which was at the just completed IUPAC General Assembly and World Chemistry Congress in São Paulo [1]. We have a grand meeting like this precisely once per year. In odd years (*i.e.*, 2017, 2015, ...) the meeting is at the GA/WCC of that year. In so-called off years, which are actually even years (*i.e.*, 2016, 2014, ...), the meeting is at the World Polymer Congress (a.k.a. MACRO conference) of that year. Most people pay most of their own way to attend these meetings. That's what camaraderie and noble endeavor can inspire. Truly we do this for love, not money.

Each meeting spans six days. Two of these are devoted to the overarching Polymer Division, the other four to the deep cogitations of the Subcommittee on Polymer Terminology. Other Subcommittees and groupings meet furtively as time allows. Everyone leaves with a deep conviction that IUPAC has an important place in the world of polymers.

The overall goal of the Polymer Division is to promote the science and technology of macromolecules and polymers (yes, there is a difference! [2]) at the international level by facilitating international scientific exchanges, by cooperating with international organizations for activities such as education and conferences, and by defining terminology and standards related to macromolecules and polymers. Mostly this is achieved via projects that are run by Task Groups,

and mostly these are set up within the four Subcommittees of the Division:

Subcommittee on Polymer Terminology (SPT):

Currently headed by Roger Hiorns, SPT develops terminological rules and definitions related to polymers, while also working with Division VIII (Chemical Nomenclature and Structure Representation Division) to provide recommendations on polymer nomenclature. It is a highly active group.

Subcommittee on Modeling of Polymerization Kinetics and Processes: This Subcommittee aspires to promote the science and technology of macromolecules and polymers by organizing studies that aim to create uniform standards related to polymerization kinetics. While many individual research groups around the world have reported kinetic parameters related to polymerizations, these parameters frequently differ from group to group because of different assumptions that have been made in the mechanistic models used. The members of this subcommittee are rectifying this situation through international collaboration.

Subcommittee on Polymer Education: The goal of SPED is to provide support towards recurrent educational activities for students in underdeveloped countries. With this in mind, one of the major activities of this Subcommittee has been to maintain a polymer education website in the name of IUPAC [3]. This website has become so popular that when one searches for "What is a polymer?" in Google, it appears as the top suggestion. Additionally, the Subcommittee has organized education sessions at MACRO World Polymer Congresses so that speakers can share best practices in polymer education from their respective countries.

Subcommittee on Structure and Properties of Commercial Polymers: Begun in 1963, this

Subcommittee is dedicated towards obtaining and reporting accurate information about commercial polymers. It consists of a large and financially self-supporting membership from both academia and industry. It has produced nearly one hundred refereed scientific publications, and it continues to roll them out at a rate of two per year, a remarkable record of sustained achievement in the name of IUPAC.

Different to others, the Polymer Division puts all its eggs in the one basket when it comes to conferences: every two years we preside over a MACRO World Polymer Congress. Recent venues have been Istanbul (2016), Chiang Mai (2014), Blacksburg VA (2012), Glasgow (2010), Taipei (2008), Rio de Janeiro (2006) and Paris (2004). In the future, we look forward to Cairns (2018), Jeju Island (2020), and Winnipeg (2022). The love is spread around!

Additionally, the Polymer Division grants IUPAC endorsement to approximately ten conferences per year, which is about one third of the IUPAC total.

The Polymer Division is privileged to offer four prestigious prizes on a biennial basis, all conferred at MACRO World Polymer Congresses. There is the DSM Materials Award for innovative research in materials sciences, the *Polymer International*-IUPAC Award for creativity in applied polymer science or polymer technology, and

the Hanwha Total-IUPAC Award for the most promising young polymer scientist from any country. We are sincerely grateful to these three organizations for their generous patronage. Most recently we have instituted the Bob Stepto Plenary Lecture Award in memory of our late and much admired ex-President [4].

As we look towards the next 50 years for the Polymer Division, the Subcommittees are focusing on efforts that will allow us to disseminate information more easily, so that we can increase our international impact and global reach. One such example is the Wikipedia project, in which task group members from SPT are working with Wikipedia to update polymer-related entries with IUPAC recommended definitions [5]. Another example is the Multilingual Project, in which basic polymer science terms are being translated into languages including Spanish, Japanese, Chinese and Russian in order to ensure that uniform standards exist in non-English languages as well. Finally, SPT has been preparing Brief Guides. These are shorter, pamphlet-like documents that are intended for a more general audience, thus achieving wider dissemination of IUPAC gospel. "A brief guide to polymer nomenclature" has already been published [6] and has gained traction amongst a number of publishers. Currently there are several other brief guides in preparation: to polymer terminology, to polymerization, and to polymer semiconductors. Their launchings will be trumpeted by the Division's nascent Twitter page!

In these and other ways we hope that our large, vibrant Division of IUPAC will remain large, vibrant and relevant. 🌐

References

1. IUPAC Congress July 2017; www.iupac2017.org
2. A.D. Jenkins, P. Kratochvil, R.F.T. Stepto and U.W. Suter, *Pure Appl. Chem.*, **68**:2287-2311 (1996).
3. IUPAC Polymer Education website; iupac.org/polymer-edu
4. R.G. Jones, *Chem. Int.*, **38** (1):21-22 (2016)
5. IUPAC recommended definitions on Wikipedia; e.g., en.wikipedia.org/wiki/Dispersity, en.wikipedia.org/wiki/Copolymer
6. R.C. Hiorns *et al.*, *Pure Appl. Chem.*, **84**:2167-2169 (2012)



Mosques, minarets and the current Officers of the Polymer Division: Michael Walter (left; Division Secretary), Greg Russell (3rd; Division President) and Christine Luscombe (4th; Division Vice-President) link arms in the fashion of a macromolecule. Second to the left is Natalie Stingelin (Titular Member).

Greg Russell is at the University of Canterbury (New Zealand) and is President of the IUPAC Polymer Division. Christine K. Luscombe is at the University of Washington (USA) and is Vice-President of the Polymer Division. Chris Fellows is at the University of New England (Australia) and is Secretary of the Subcommittee on Polymer Education, as well as being the super-domestique of the Polymer Division. They enjoy each other's company.