

Preface

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Celebrating a centenary of macromolecules

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It was in 1919 in Zurich when Staudinger first mentioned substances composed of covalently linked chain-like molecules with a high chain length and hence a high molecular mass. In 1920, he published his landmark paper entitled “Über Polymerisation”, where he presented an extension version of the concept of covalent long chain molecules. Therefore, we celebrated 100 years of polymer science in 2020, although the first reports of polymers (natural) rubber date back to ancient civilizations in Mexico and Central America. To commemorate this centenary in style, the IUPAC Polymer Division has collected a number of papers on polymer science.

The IUPAC Polymer Division turned 50 in 2017 and is concerned with the science and technology of macromolecules and polymers. Its aim is to promote macromolecular and polymer science at international level and define terminology and standards in this area. While the first commercial plastics brought a revolution in the field, there has been a gradual shift in perception when plastic debris was first discovered in the oceans and there are growing concerns around environmental pollution. Anecdotally, in the movie “The Graduate” Dustin Hoffman’s character was urged by an older acquaintance to make a career in plastics since the industry at the time was a symbol of cheap conformity and superficiality. Therefore, there is a role of the Division to demonstrate the central role polymers play in our society and how they have transformed our life for the better. Nonetheless, we will also address apprehensions about the use of plastics and sustainability and critically review challenges ahead.

For this special issue, we have collected seven papers that embody the spirit of Celebrating the Centenary in Polymer Science. We hope you enjoy reading them.

The issue consists of two historical perspectives, one on Staudinger and his journey to getting the structure of polymers accepted by the scientific community, and one on elucidating the spatial organizations and interactions of cellulose via spectroscopic methods. There are two review papers on polymers one reviewing natural rubber latex preservation systems and the other one on polymer bioelectronics. There is also a number of original scientific papers looking at the development of anti-fouling coatings inspired by nature, dielectric properties of food, and influence of thermal treatment of the properties of natural rubber-salt systems. Finally, we have two perspective pieces one addressing equality, diversity, and inclusion in polymer science and one on the history and future of the IUPAC Subcommittee on Polymer Technology.

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