IUPAC- Polymer Division IV

Subcommittee on Polymer Terminology

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CHAIR : Patrick Theato

SECRETARY: John B. Matson

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

INTRODUCTION

In 1952, the Sub-commission on Nomenclature to the **IUPAC Commission on Macromolecules** published its first recommendations. In 1968 IUPAC formally established the Commission on Macromolecular Nomenclature (Commission IV.1), which became the leading nomenclature body in the field of polymers. In 2002 the Commission became the Subcommittee on Macromolecular Terminology, and in 2005 was renamed the **Subcommittee on Polymer Terminology**.

As well as being tasked with establishing **terminological rules and definitions**, the Subcommittee also advises the **Chemical Nomenclature and Structure Representation Division (VIII)** on the development of polymer nomenclature.

As the former Commission, rules were developed for naming regular single-strand macromolecules, copolymer molecules, irregular macromolecules, ladder and spiro macromolecules, and nonlinear and network polymers. Rules for representing the structures of macromolecules were also developed. Latterly, while still addressing issues of **polymer nomenclature**, the Subcommittee has worked to **standardize** the **terminology** used in polymer science. Amongst other topics, it has developed a glossary of basic terms, and made recommendations concerning the terminology of assemblies of polymer molecules and non-linear macromolecules, polymer solutions, polymer crystals, types of polymerization, kinetics and thermodynamics of polymerization, degradation and aging of polymers, and the mechanical behavior of polymers.

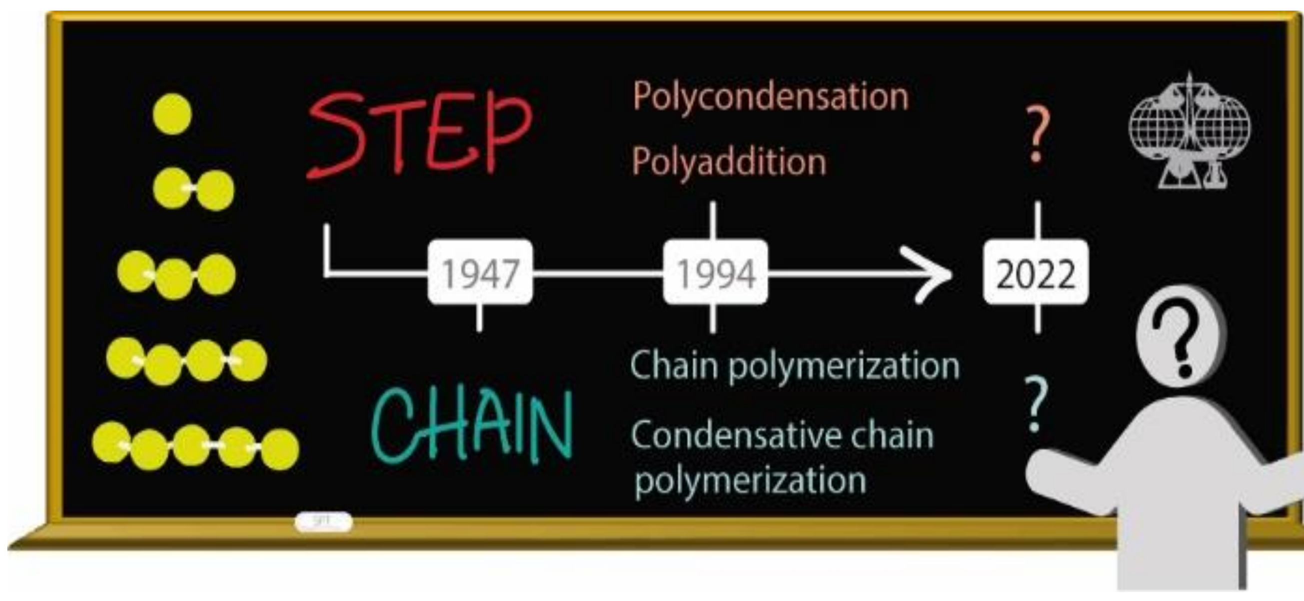
Since its inception, the Subcommittee has attracted the participation of exceptional scientists from **academia**, **publishing houses**, and the **polymer industry**.

ONGOING PROJECTS

Project number	Acronym	TGL	Project title
2023-007-1-400	MASSIVE	Keddie	Clarifications of Definitions for Polymer Molar Mass Averages
2022-006-2-400	R-BGN	Hiorns	Revision of the Brief Guide to Polymer Nomenclature
2020-024-3-400	SUPRA	Gosecka	Nomenclature and terminology for supramolecular polymers
2019-043-2-400	GOLDEN	dos Santos	Gold Book Updates for Polymers
2019-041-3-400	SEQ	Theato	Nomenclature of Sequence-Controlled Polymers
2019-036-1-800	STARS2	Chen	Structure-based nomenclature for irregular linear, star, comb and brush polymers with different types of constitutional repeating units (CRU)
2019-027-1-400	OVER	Matson	Basic classification and definitions of polymerization reactions
2019-010-2-400	AGGREGATES	Nakano	Terminology of Polymer Aggregates
2018-033-1-400	ADDIPLAST	(Malinconico) Giuntini	Additives intended to promote the degradation of polyolefin-based thermoplastic materials
2016-050-3-400	µSTRUCTURE	Stingelin	Definition of Terms Pertaining to Polymers in the Solid State: Molecular Arrangement from the Nano- to the Micrometer Scale
2017-039-2-800	GRAPHIC	Theato	Graphical Representation of Polymer Structures
2015-050-1-400	ULTIMATE	Adhikari	Definition of Terms Relating to the Ultimate Mechanical Properties of Polymers
2015-049-1-400	CHAR	Topham	Brief Guide to the Characterisation of Polymers
2015-032-2-400	WIKI	Hess	Synchronizing Wikipedia: Polymer Definitions and Terminology
2015-014-1-400	SEMIS	Walter	Guide (and Brief Guide) to Polymer Semiconductors
2014-014-1-400	MODSIM	Meille	Terminology for Modeling and Simulation of Polymers
2013-049-1-400	SEPARATION	Hess	Terminology on the separation of macromolecules
2011-035-1-800	TINCOPS	Jones	Terminology and nomenclature of inorganic and coordination polymers – a extended revision of Nomenclature for regular single-strand and quasi-single-strand inorganic and coordination polymers (1984)

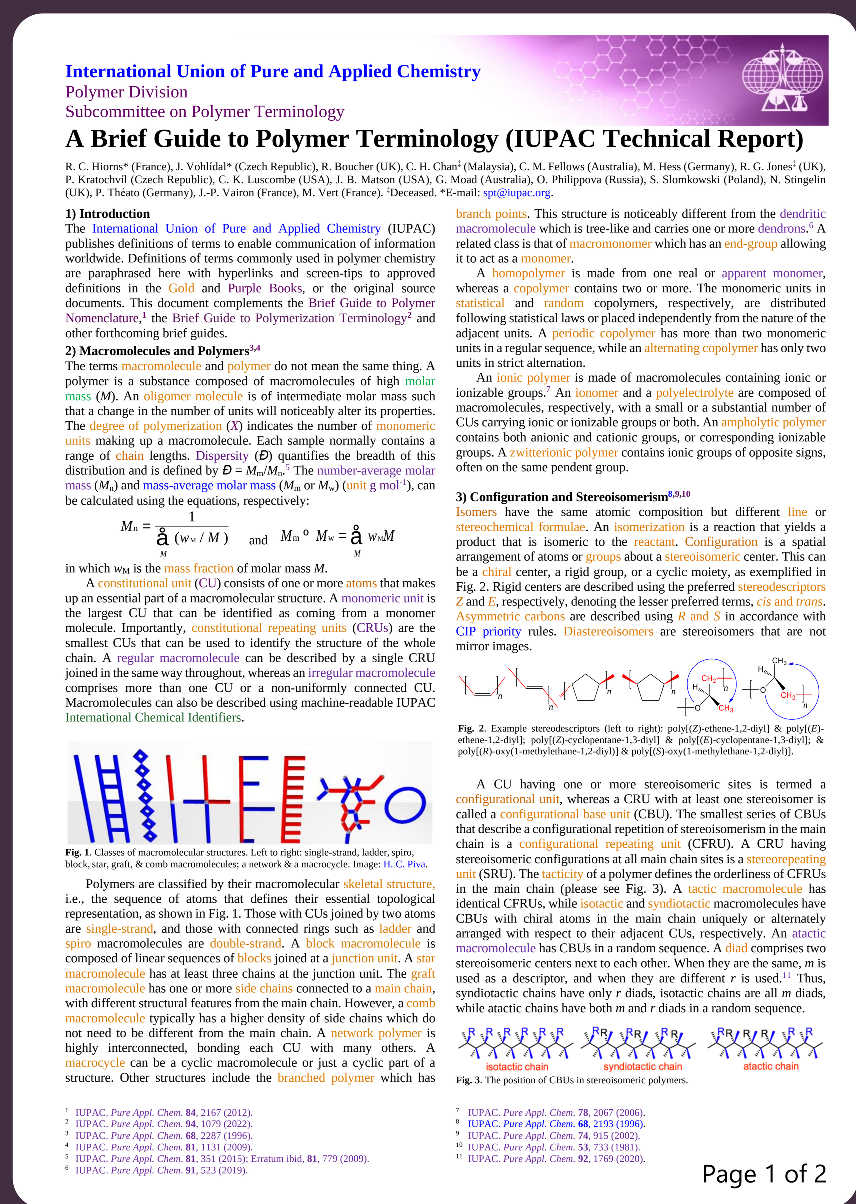
Reconsidering Terms for Mechanisms of Polymer Growth: The "Step-Growth" and "Chain-Growth" Dilemma

Chin Han Chan, Jiun-Tai Chen, Wesley S. Farrell, Christopher M. Fellows, Daniel J. Keddie, Christine K. Luscombe, John B. Matson, Jan Merna, Graeme Moad, Gregory T. Russell, Patrick Théato, Paul D. Topham, Lydia Sosa-Vargas



We do not recommend new terms here. Instead, members of SPT detail our concerns with these terms and seek suggestions from the community on how to provide **clear**, **simple**, and **consistent** terms to describe the **two major mechanisms** of polymer growth.

Reference. *Polym. Chem.* **2022**, *13*, 2262–2270. doi: 10.1039/d2py00086e


International Union of Pure and Applied Chemistry
Polymer Division
Subcommittee on Polymer Terminology
A Brief Guide to Polymer Terminology (IUPAC Technical Report)
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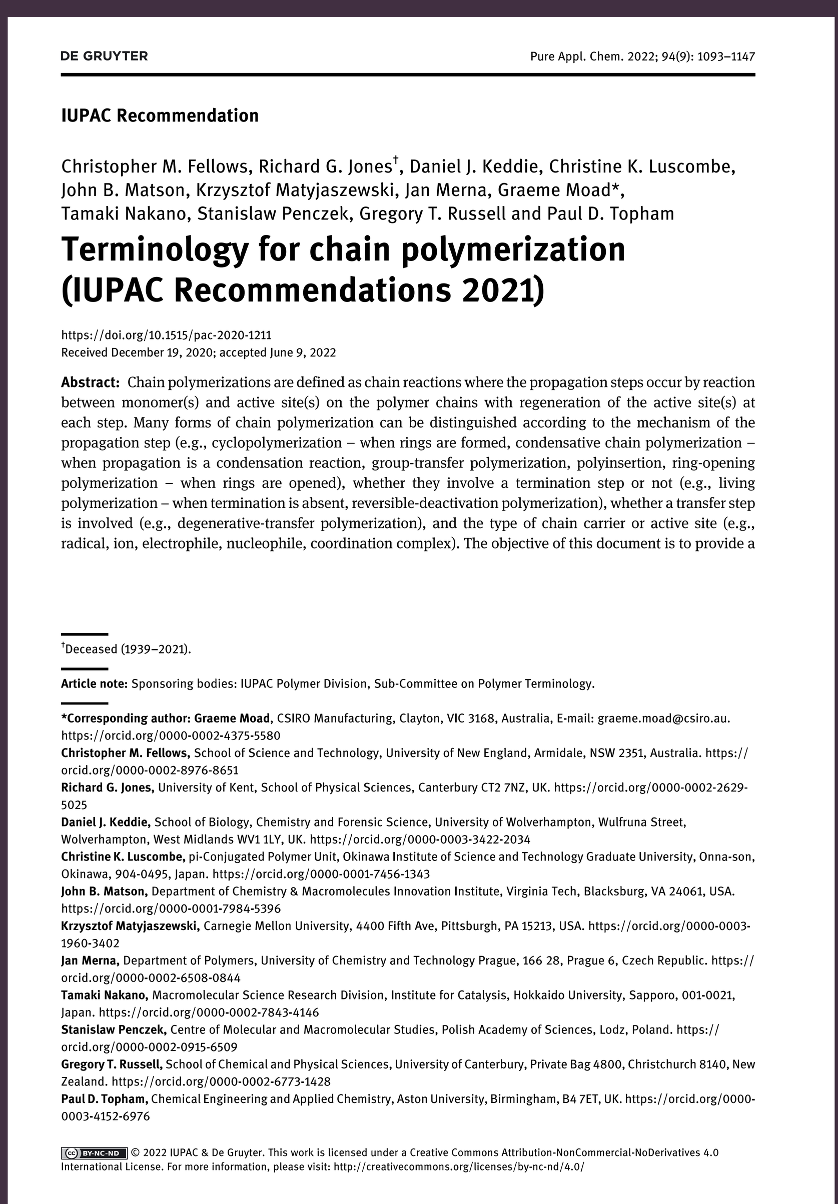
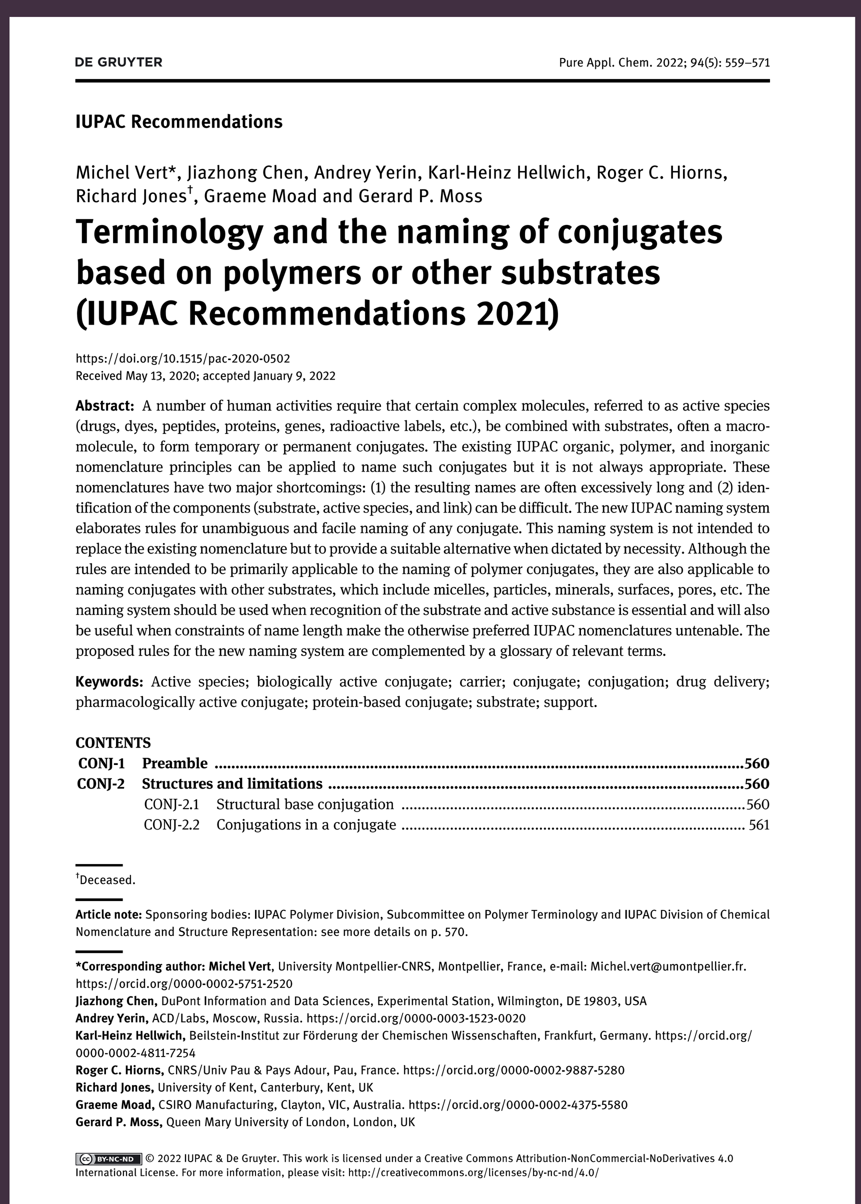
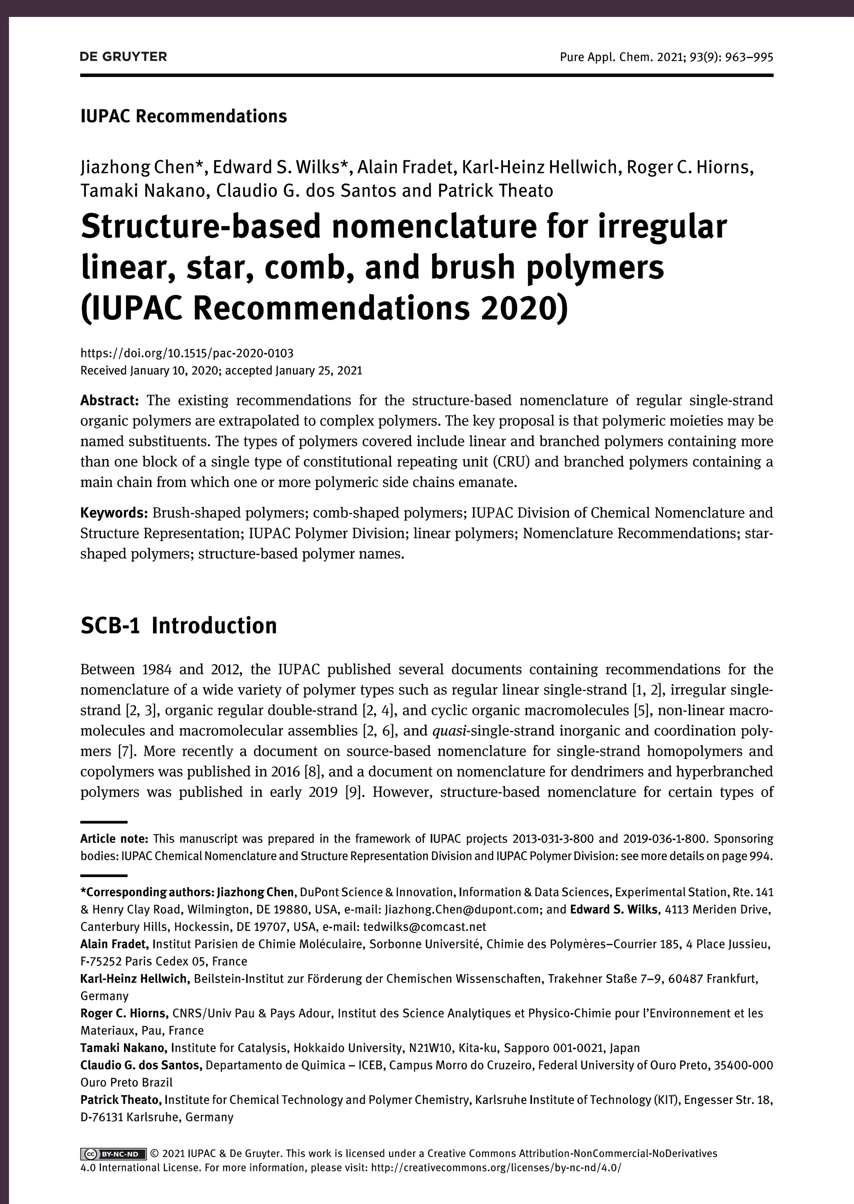
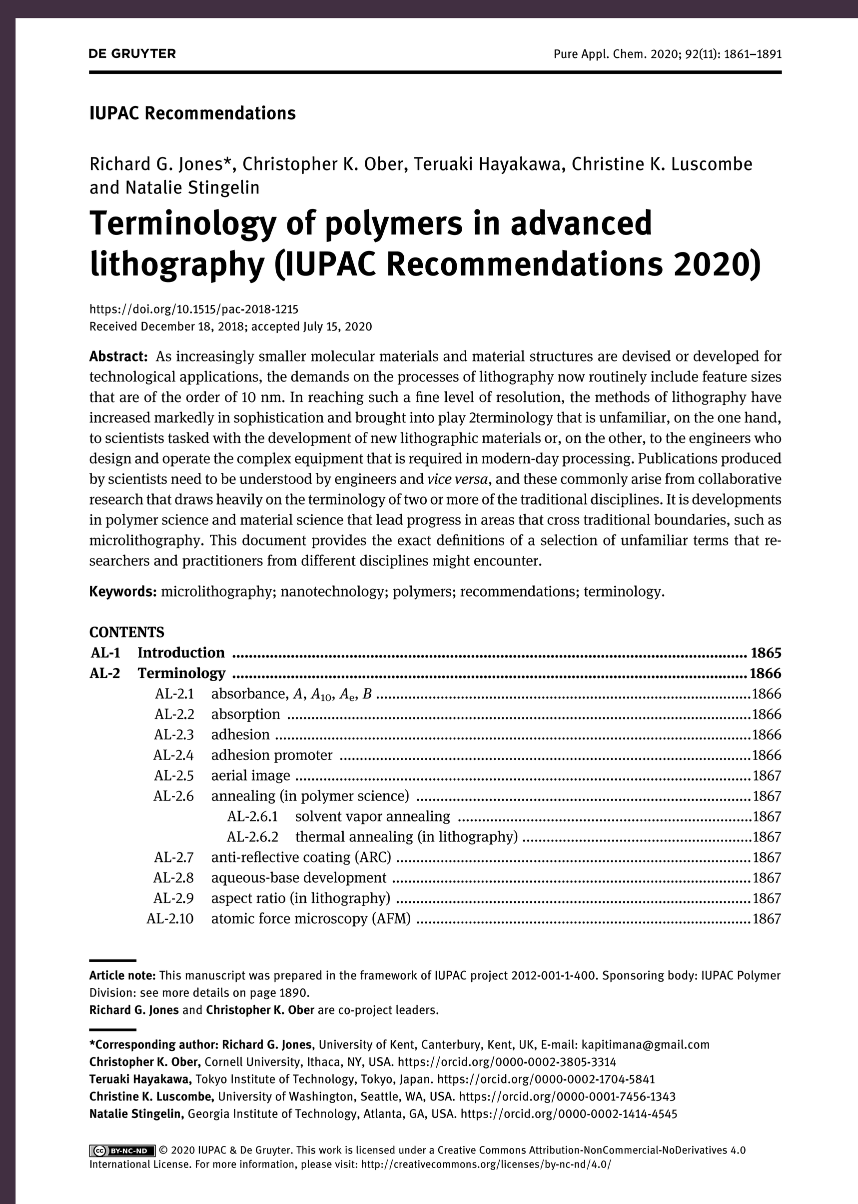
RECENT PUBLICATIONS


DE GRUYTER — Pure Appl. Chem. 2022; 94(9): 1093–1147
IUPAC Recommendation
Christopher M. Fellows, Richard G. Jones*, Daniel J. Keddie, Christine K. Luscombe, John B. Matson, Krzysztof Matyjaszewski, Jan Merna, Graeme Moad*, Tamaki Nakano, Stanislaw Penczek, Gregory T. Russell and Paul D. Topham
Terminology for chain polymerization (IUPAC Recommendations 2021)


DE GRUYTER — Pure Appl. Chem. 2022; 94(5): 559–571
IUPAC Recommendations
Michel Vert*, Jiazhong Chen, Andrey Yerin, Karl-Heinz Hellwich, Roger C. Hiorns, Richard Jones*, Graeme Moad and Gerard P. Moss
Terminology and the naming of conjugates based on polymers or other substrates (IUPAC Recommendations 2021)


DE GRUYTER — Pure Appl. Chem. 2021; 93(9): 963–995
IUPAC Recommendations
Jiazhong Chen*, Edward S. Wilks*, Alain Fradet, Karl-Heinz Hellwich, Roger C. Hiorns, Tamaki Nakano, Claudio G. dos Santos and Patrick Theato
Structure-based nomenclature for irregular linear, star, comb, and brush polymers (IUPAC Recommendations 2020)


DE GRUYTER — Pure Appl. Chem. 2020; 92(11): 1861–1891
IUPAC Recommendations
Richard G. Jones*, Christopher K. Ober, Teruaki Hayakawa, Christine K. Luscombe and Natalie Stingelin
Terminology of polymers in advanced lithography (IUPAC Recommendations 2020)

PERSPECTIVES - List of envisioned projects

- Degradation of Polymers (Gardette)
- Revision of Purple Book (Theato)
- Polymers of Relevance to Human Health (Stingelin)
- Polymers for 3D printing (Walter)
- Terminology for constitutionally-dynamic polymers (Vohlídal)
- Terminology of renewable and recycled polymers (Vairon)
- Electronic Formulae of Polymers (Yerin)
- Drawing of chemical structures of polymeric networks (Theato)
- Sustainable Polymers (Topham)
- Terminology of copolymerization (Moad)
- Polyaddition/polycondensation ...