IUPAC source documents

Choose from the following topics a concept/topic for your video!

BASIC POLYMER CONCEPTS	ADVANCED POLYMER CONCEPTS
Polymer (monomer, macromolecule) Plastics Plastic lifecycle Polymer degradation Polymer recycling Polymerization reactions Crosslinking in polymers Mechanical properties of polymers Thermal properties of polymers The role of polymers in modern society Polymers in energy Polymers in health Polymers and the environment	Polymerization mechanisms – chain vs STEP dilemma Reversible addition–fragmentation chain transfer (RAFT) polymerization Atom transfer radical polymerization (ATRP) Ring opening polymerization Polymerization-induced self-assembly (PISA) Thermodynamic principles of polymerization Physical crosslinking versus chemical crosslinking Polymerization kinetics NMR spectroscopy in polymer Science Dispersity and molar mass Size exclusion chromatography (SEC) Thermal and thermomechanical properties of polymers Crystallinity in polymers Polymer microstructure Rheology of polymers Glass transition temperature

LIST of IUPAC documents for reference

Please use these documents as the main source material for your videos, if there is no IUPAC document available for the topic you have selected, let us know so that we can address this at a later time.

BASIC POLYMER CONCEPTS	Document reference + link
Polymer (monomer, macromolecule) The role of polymers in modern society	**The IUPAC Polymer Education website** https://iupac.org/polymer-edu/
Plastics Plastic lifecycle Polymer degradation Polymer recycling	**Polymer degradation: a short review,** Chemistry Teacher International, vol. 3, no. 2, 2021, pp. 213-220. https://doi.org/10.1515/cti-2020-0015
Polymer Nomenclature	**A Brief Guide to Polymer Nomenclature** https://iupac.org/wp-content/uploads/2019/07/140-Brief-Guide-to-Polymer-Nomenclature-Web-Final-d.pdf

Polymerization mechanisms	**Reconsidering terms for mechanisms of polymer growth: the "step-growth" and "chain-growth" dilemma**, *Polym. Chem*., 2022,*13*, 2262-2270, https://doi.org/10.1351/pac199466122483 **A brief guide to polymerization terminology (IUPAC Technical Report),** *Pure and Applied Chemistry*, vol. 94, no. 9, 2022, pp. 1079-1084. https://doi-org.inc.bib.cnrs.fr/10.1515/pac-2021-0115
Mechanical properties of polymers Thermal properties of polymers	**Glossary of terms relating to thermal and thermomechanical properties of polymers (IUPAC Recommendations 2013)** *Pure and Applied Chemistry*, vol. 85, no. 5, 2013, pp. 1017-1046. https://doi.org/10.1351/PAC-REC-12-03-02
IUPAC and Polymer Science Education	**The Contribution of IUPAC to Polymer Science Education** *J. Chem. Educ.* 2017, 94, 11, 1618–1628 https://doi.org/10.1021/acs.jchemed.6b00800

ADVANCED POLYMER CONCEPTS	(IUPAC) Document reference + link
Radical Polymerization	**Educational Workshop in Polymer Sciences 2016 (IUPAC project** https://iupac.org/project/2015-057-1-400) Workshop slides: Part 1: https://iupac.org/wp-content/uploads/2017/03/IUPAC_PolymEdu_EduWorkshop_PPT_Shipp1.pdf) Part 2: https://iupac.org/wp-content/uploads/2017/03/IUPAC_PolymEdu_EduWorkshop_PPT_Shipp2.pdf
Reversible addition–fragmentation chain transfer (RAFT) polymerization	**Fundamentals of reversible addition–fragmentation chain transfer (RAFT),** Chemistry Teacher International, vol. 3, no. 2, 2021, pp. 3-17. https://doi.org/10.1515/cti-2020-0026 **Reversible-Deactivation Radical Polymerisation: chain polymerisation made simple**, Chemistry Teacher International, vol. 3, no. 2, 2021, pp. 19-32 . https://doi.org/10.1515/cti-2020-0025
Chain polymerization	**Terminology for chain polymerization (IUPAC Recommendations 2021)** *Pure and Applied Chemistry*, vol. 94, no. 9, 2022, pp. 1093-1147. https://doi.org/10.1515/pac-2020-1211
Ring opening polymerization	**Ring-opening polymerization**, Chemistry Teacher International, vol. 3, no. 2, 2021, pp. 33-57. 10.1515/cti-2020-0028
Polymerization-Induced Self-Assembly (PISA)	**Polymerization Induced Self-Assembly (PISA): Experimental Approaches to Preparing Polymer Nano-objects using PISA**, Simon Harrison, Educational Workshop MACRO 2022 Workshop slides: https://www.macro2022.org/wp-content/uploads/2022/07/MACRO-2022-Education-Workshop-Simon-Harrison-Slides.pdf Workshop video: https://youtu.be/MIdmjKH30jI

Dispersity and molar mass	**Dispersity in polymer science** (IUPAC Recommendations 2009), *Pure and Applied Chemistry*, vol. 81, no. 2, 2009, pp. 351-353. https://doi.org/10.1351/PAC-REC-08-05-02 **Dispersity, Distributions & self-assembly**, Educational Workshop MACRO 2022 Workshop slides: https://iupac.org/wp-content/uploads/2022/08/IUPAC_PolymEdu_EduWorkshop2022_PPT_Cunningham.pdf Workshop video: https://youtu.be/lUK6nQmaqhI
Size exclusion chromatography (SEC)	**Size-exclusion chromatography as a useful tool for the assessment of polymer quality and determination of macromolecular properties**, *Chemistry Teacher International*, vol. 3, no. 2, 2021, pp. 77-103. https://doi.org/10.1515/cti-2020-0024
Thermal Analysis	**Thermal analysis: basic concept of differential scanning calorimetry and thermogravimetry for beginners**, *Chemistry Teacher International*, 2021, *3*, 2, 59-75 https://doi.org/10.1515/cti-2020-0010 Workshop slides: https://iupac.org/wp-content/uploads/2017/12/IUPAC_PolymEdu_Shortcourse_2ppt_JeanMarcSaiter.pdf
X-ray Scattering	**Education program for controversial defect of recent X-ray instrument termed as a simultaneous small angle X-ray scattering and wide-angle X-ray diffraction measuring instrument** *Pure and Applied Chemistry*, vol. 90, no. 6, 2018, pp. 969-987. https://doi.org/10.1515/pac-2017-0801 Workshop slides: https://iupac.org/wp-content/uploads/2017/12/IUPAC_PolymEdu_Shortcourse_4ppt_MasaruMatsuo.pdf **Determination of thermodynamic and structural quantities of polymers by scattering** techniques *Pure and Applied Chemistry*, vol. 90, no. 6, 2018, pp. 955-968. https://doi.org/10.1515/pac-2017-1101 Workshop slides: https://iupac.org/wp-content/uploads/2017/12/IUPAC_PolymEdu_Shortcourse_5PPT_VolkerAbetz.pdf
Ceiling Temperature Rheology of polymers Glass transition temperature	**Basic principle and good practices of rheology for polymers for teachers and beginners**, *Chemistry Teacher International*, vol. 4, no. 4, 2022, pp. 307-326. https://doi.org/10.1515/cti-2022-0010

Electrochemical characterization of polymer electrolytes	**Basics of teaching electrochemical impedance spectroscopy of electrolytes for ion-rechargeable batteries – part 1: a good practice on estimation of bulk resistance of solid polymer electrolytes,** *Chemistry Teacher International*, vol. 3, no. 2, 2021, pp. 105-115. https://doi.org/10.1515/cti-2020-0011 Workshop slides: https://iupac.org/wp-content/uploads/2017/12/IUPAC_PolymEdu_Shortcourse_1ppt_ChinHanChan.pdf
Nomenclature	**A concise guide to polymer nomenclature for authors of papers and reports in polymer science and technology (IUPAC Technical Report)**, *Pure Appl. Chem.*, ***92(5)***, 797 (2020) https://doi.org/10.1515/pac-2018-0602 **Terminology and structure-based nomenclature of dendritic and hyperbranched polymers (IUPAC Recommendations 2017)**, *Pure & Appl. Chem.*, ***91(3)***, 523 (2019) https://doi.org/10.1515/pac-2016-1217 **Preferred names of constitutional units for use in structure-based names of polymers (IUPAC Recommendations 2016)**, *Pure Appl. Chem*., **89**, 1695 (2017) https://doi.org/10.1515/pac-2016-0502 **Source-based nomenclature for single-strand homopolymers and copolymers (IUPAC Recommendations 2016**), *Pure Appl. Chem.*, **88**, 1073 (2016) https://doi.org/10.1515/pac-2015-0702 **Abbreviations of polymer names and guidelines for abbreviating polymer names (IUPAC Recommendations 2014)**, *Pure Appl. Chem*., **86**, 1003 (2014). https://doi.org/10.1515/pac-2012-1203 **Structure-based nomenclature for cyclic organic macromolecules (IUPAC Recommendations 2008)**. *Pure Appl. Chem*., **80**, 201 (2008). https://doi.org/10.1351/pac200880020201