

pages are descriptions of successful applications of the technology at each step of the scientific research workflow—from the timestamping of ideas to funding, to actual experimentation, to the analysis of research results, and ultimately to the sharing of information and the publication of results. However, not all blockchain use cases have such a successful conclusion. In this white paper you will learn where the technology has not worked—and why—thanks to those interviewed who discussed in detail the lessons that they themselves learned during their own blockchain journey. In addition, the paper highlights the potential future uses of

the technology; the pitfalls to avoid when considering its use; when and how legislation and regulatory policies come into play; and how the technology is evolving and growing stronger (some say that the fourth generation of the blockchain evolution is on the horizon!). The paper also discusses parallel developments in quantum computing, its potential impact on blockchain technology, and what developments are in progress to ensure a stable and provably secure, quantum safe alternative to the existing blockchain approaches.

<https://iupac.org/project/2023-009-1-024/>

Let's celebrate IYQ

The 2025 International Year of Quantum Science and Technology (IYQ) recognizes 100 years since the initial development of quantum mechanics <quantum2025.org>. Joining in the celebrations, IUPAC has prepared a special Issue of *Pure and Applied Chemistry*, containing about 40 invited articles that recognize the impact of quantum science and technology in many branches of chemistry. The Guest Editors are Manuel Yáñez (manuel.yanez@uam.es), Autonomous University of Madrid, Spain and Russell J. Boyd (russell.boyd@dal.ca), Dalhousie University, Canada.



IUPAC Provisional Recommendations

Provisional Recommendations are preliminary drafts of IUPAC recommendations. These drafts encompass topics including terminology, nomenclature, and symbols. Following approval, the final recommendations are published in IUPAC's journal *Pure and Applied Chemistry* (PAC) or in IUPAC books. During the commentary period for Provisional Recommendations, interested parties are encouraged to suggest revisions to the recommendation's author. <https://iupac.org/recommendations/under-review-by-the-public/>

Basic Classification and Definitions of Polymerization Reactions

Corresponding Author: John B. Matson jbmatson@vt.edu

This document provides recommendations addressing the long-standing dilemma of the wide variety of terms that are used to describe the two common classes of polymerization mechanisms in the scientific literature, which includes chemistry and polymer-science textbooks. It is an update of a 1994 IUPAC document on this topic and provides clarification and hierarchical structure regarding the basic classification and terminology describing polymerization reactions. The term step polymerization describes polymerizations in which growth occurs by reactions between monomer, oligomer, or polymer molecules of any length. We clearly denote here the two subclasses

of step polymerization: additive step polymerization (synonym: polyaddition) and condensative step polymerization (synonym: polycondensation). The term chain polymerization describes polymerizations that proceed via a chain reaction with monomer molecules adding to active sites on polymer chains. Subclasses of chain polymerization include additive chain polymerization and condensative chain polymerization. The terms provide a logical and straightforward structure for describing the two common classes of polymerization mechanisms. Previously defined terms relevant to these two classes of polymerization reactions are also replicated in this Recommendation document.

Comments by 30 November 2025

<https://iupac.org/recommendation/basic-classification-and-definitions-of-polymerization-reactions/>