Journal of Polymer Science & Applications

Editorial A SCITECHNOL JOURNAL

Polymer Degradation and Stability

Alexander Klibanov *

There has been and still is considerable confusion concerning the classification of polymers. This is often especially the case for the start student who must appreciate that there's no single generally accepted classification that's unambiguous. During the event of polymer science, two sorts of classifications have inherited use. One classification is predicated on polymer structure and divides polymers into condensation and addition polymers. The opposite classification is predicated on polymerization mechanism and divides polymerizations into step and chain polymerizations. Confusion arises because the 2 classifications are often used interchangeably without careful thought. The terms condensation and step are often used synonymously, as are the terms addition and chain. Although these terms may often be used synonymously because most condensation polymers are produced by step polymerizations and most addition polymers are produced by chain polymerizations, this is often not always the case. The condensation–addition classification is predicated on the composition or structure of polymers. The step–chain classification is predicated on the mechanisms of the polymerization processes.

In addition to the structural and compositional differences between polymers, Flory [1953] stressed the very significant difference within the mechanism by which polymer molecules are built up. Although Flory continued to use the terms condensation and addition in his discussions of polymerization mechanism, the newer terminology classifies polymerizations into step and chain polymerizations. Chain and step polymerizations differ in several features, but the foremost important difference is within the identities of the species which will react with one another. Another difference is that the manner during which polymer molecular size depends on the extent of conversion. Step polymerizations proceed by the stepwise reaction between the functional groups of reactants as in reactions like those described by Eqs. 1-1 through 1-3 and Eqs. 1-6 through 1-8. the dimensions of the polymer molecules increases at a comparatively slow pace in such polymerizations. One proceeds from monomer to dimer, trimer, tetramer, pentamer, then on Monomer monomer dimer + Dimer monomer trimer + Dimer dimer tetramer + Trimer monomer tetramer + Trimer dimer pentamer + Trimer trimer hexamer + 6 INTRODUCTION Tetramer monomer pentamer + Tetramer dimer hexamer + Tetramer trimer heptamer + Tetramer tetramer octamer etc. until eventually large-sized polymer molecules are formed. The characteristic of step polymerization that distinguishes it from chain polymerization is that reaction occurs between any of the different-sized species present within the reaction system. things is sort of different in chain polymerization where an initiator is employed to supply an initiator species R* with a reactive center. The reactive center could also be a radical, cation, or anion. Polymerization occurs by the propagation of the reactive center by the successive additions of huge numbers of monomer molecules during a chain reaction. The peculiarity of chain polymerization is that polymer growth takes place by monomer reacting only with the reactive center. Monomer doesn't react with monomer and therefore the different-sized species like dimer, trimer, tetramer, and n mer don't react with one another. Initiation involves the acquisition of a lively site by the monomer.

Author Affiliation Top

Department of Chemistry & Biochemistry, Texas State University, USA

***Corresponding author:** Alexander Klibanov Department of Chemistry and Bioengineering, The Massachusetts Institute of Technology, USA, Tel: (617) 253-0630 E-mail: klibanov@mit.edu

Received: November 2, 2020 **Accepted:** November 17, 2020 **Published:** November 17, 2020