

1. Record Nr.	UNINA9911007486603321
Autore	Hentschke Reinhard
Titolo	A Concise Introduction to Polymer Physics : Theoretical Concepts and Applications / / by Reinhard Hentschke
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	3-031-87324-6
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (377 pages)
Collana	Undergraduate Lecture Notes in Physics, , 2192-4805
Disciplina	530.41
Soggetti	Soft condensed matter Polymers Soft and Granular Matter
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Polymers - Microstructure, Classification, and Mass -- Equilibrium Conformation of Single Chains -- Thermodynamics of Blends, Solutions, and Networks -- Polymer Dynamics -- Selected Topics (Aspects of the Mechanics of Polymers, Filler Effects, Stable and Labile Liquid Crystalline Polymers, Polyelectrolytes) -- Appendix A: Phenomenological Models for Viscoelasticity -- B: Persistence Length from Fluctuation Theory -- C: Teaching and Studying the Material in these Notes.
Sommario/riassunto	This textbook provides a concise and transparently structured one-semester course in polymer physics - the science, in addition to polymer chemistry, behind a class of ubiquitous materials. It covers all major theoretical concepts and their applications in six chapters, including the conformations of chains, the thermodynamics of mixtures, solutions and networks, and the dynamics of polymers. Selected topics highlight aspects of polymer mechanics, the role of particulate fillers, stable and labile liquid crystal polymers, and polyelectrolytes. Solved problems deepen and extend important points that are explained in the main chapters. The emphasis is on the derivation of the results and not on their mere presentation. If a result can be obtained using different theoretical methods or viewed from a different angle, an attempt is made to explain the relationships

between the methods as clearly as possible. In addition, the validation of theoretical results through suitable experiments is always included. All this assumes a certain familiarity with statistical thermodynamics and its mathematics, which means that the text is best suited for upper undergraduate level.
