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3.4 Useful Relations for Material Functions3.4.1 Effect of Molecular Weight; 3.4.2 Relations Between Linear Viscoelastic Properties and Viscometric Functions; 3.4.3 Branching; 3.5 Rheological Measurements and Polymer Processability; 3.6 Solution to Design Problem II; Problems; References; 4 Diffusion and Mass Transfer; DESIGN PROBLEM III DESIGN OF A DRY-SPINNING SYSTEM; 4.1 Mass Transfer Fundamentals; 4.1.1 Definitions of Concentrations and Velocities; 4.1.2 Fluxes and Their Relationships; 4.1.3 Ficks First Law of Diffusion; 4.1.4 Microscopic Material Balance
4.1.5 Similarity with Heat Transfer: Simple Applications4.2 Diffusivity, Solubility, and Permeability in Polymer Systems; 4.2.1 Diffusivity and Solubility of Simple Gases; 4.2.2 Permeability of Simple Gases and Permachor; 4.2.3 Moisture Sorption and Diffusion; 4.2.4 Permeation of Higher-Activity Permeants; 4.2.5 Polymer-Polymer Diffusion; 4.2.6 Measurement Techniques and Their Mathematics; 4.3 Non-Fickian Transport; 4.4 Mass Transfer Coefficients; 4.4.1 Definitions; 4.4.2 Analogies Between Heat and Mass Transfer; 4.5 Solution to Design Problem III; Problems; References
5 Nonisothermal Aspects of Polymer ProcessingDESIGN PROBLEM IV CASTING OF POLYPROPYLENE FILM; 5.1 Temperature Effects on Rheological Properties; 5.2 The Energy Equation; 5.2.1 Shell Energy Balances; 5.2.2 Equation of Thermal Energy; 5.3 Thermal Transport Properties; 5.3.1 Homogeneous Polymer Systems; 5.3.2 Thermal Properties of Composite Systems; 5.4 Heating and Cooling of Nondeforming Polymeric Materials; 5.4.1 Transient Heat Conduction in Nondeforming Systems; 5.4.2 Heat Transfer Coefficients; 5.4.3 Radiation Heat Transfer; 5.5 Crystallization, Morphology, andOrientation
5.5.1 Crystallization in the Quiescent State

Sommario/riassunto

Emphasizing fundamental concepts that allow a student, novice, or practicing engineer to carry out practical design decisions, Polymer Processing: Principles and Design provides the numerical methods required to solve the equations using a computer and easy-to-use IMSL numerical subroutines, ensuring a solid foundation in the principles underlying the design of polymer processing techniques. Presenting the background required to design processes for thermoplastics, this thoroughly updated second edition adds a ""Green Engineering"" component and a CD with numerical subroutines guidance

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Autore	Shames Lisa
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