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Nota di contenuto	Introduction to Polymer Rheology; Contents; 1. INTRODUCTION; A. Polymers and the importance of rheology; B. Rheology in its simplest form; Problems; Suggested references, with commentary; 2. STRESS; A. Stress and pressure; B. Organization of the stress components; C. Coping with subscripts; D. Typical stress tensors; Appendix 2-1: Compilation of equations of motion (ssc); Appendix 2-2: Equations of motion-curvilinear quick list (ssc); Problems; References; 3. VELOCITY, VELOCITY GRADIENT AND RATE OF DEFORMATION; A. Why velocity is simpler than location-Speedometers vs. GPS B. Velocity gradientsC. Rate of deformation; Appendix 3-1: Components of the rate-of-deformation tensor; Appendix 3-2: Components of the continuity equation; Appendix 3-3: Nomenclature and sign conventions used in popular rheology texts; Problems; References; 4. RELATIONSHIP BETWEEN STRESS AND RATE OF DEFORMATION: THE NEWTONIAN FLUID; A Material idealizations in rheology; B. The Newtonian fluid; Problems; References; 5. GENERALIZED NEWTONIAN FLUIDS-A SMALL BUT IMPORTANT STEP TOWARD A DESCRIPTION OF REAL BEHAVIOR FOR POLYMERS A. Reasons for inventing generalized Newtonian fluids-behavior of

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F. Transient rheological functionsD. Temperature effects and superposition of steady-flow data; Problems; References; 7. EXPERIMENTAL METHODS; A. Measurement of viscosity; B. Normal stresses from shearing flows; C. Extensional rheology; D. Specialized geometries; E. Flow visualization and other rheo-optical methods; F. Micro and nano rheology; Appendix 7-1: Numerical derivatives; Appendix 7-2: Velocity-profile correction for non-Newtonian fluids; Appendix 7-3: Incorporation of slip into the velocity-profile correction-the Mooney correction
Appendix 7-4: Normal stresses using the cone-and-plate geometryAppendix 7-5: Desktop rheo-optical experiment; Problems; References; 8. STRAIN, SMALL AND LARGE; A. Displacement; B. Infinitesimal strain; C. Hookean solids; D. Finite strain; E. The Lodge elastic fluid and variants; F. The Cauchy strain measure; G. Fixing up integral equations based on C and C-1; Appendix 8-1: The relaxation function; Appendix 8-2: Constant-rate extension of the LEF; Problems; References; 9. MOLECULAR ORIGINS OF RHEOLOGICAL BEHAVIOR; A. Description of polymer molecules
B. The Rouse chain-a limited description of polymer behavior

Sommario/riassunto

"Providing new students and practitioners with an easy-to-understand introduction to the theory and practice an often complicated subject, Introduction to Polymer Rheology incorporates worked problems and problems with appended answers to provide opportunities for review and further learning of more advanced concepts. By limiting the use of mathematics within an approachable format, this introductory overview ensures practicing scientists and engineers understand the concepts underlying the flow behavior of polymer melts, solutions, and suspensions, and are able to interpret experimental data correctly and provide additional insight on a process"--