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2.1.5 Classification of Forces; 2.2 Rheology of Soft Jammed Systems (Pastes); 2.2.1 Solid Regime: Viscoelasticity; 2.2.2 Solid-Liquid Transition: Yielding; 2.2.3 Liquid Regime: Flow
2.2.4 Time Effects: Thixotropy2.2.5 Synthesis; 2.3 Rheology of Granular Materials; 2.3.1 Frictional Regime; 2.3.2 Collisional Regime; 2.3.3 Frictional-Collisional Regime Transition; 2.4 Rheology of Granular Pastes; 2.4.1 Frictional Regime; 2.4.2 Lubricational Regime; 2.4.3 Frictional-Lubricational Regime Transition; References; 3 EXPERIMENTAL PROCEDURES AND PROBLEMS IN PASTE VISCOMETRY; 3.1 Experimental Procedures; 3.1.1 Setup of the Material; 3.1.2 Viscoelasticity in the Solid Regime; 3.1.3 Yielding: Solid-Liquid Transition; 3.1.4 Flow Curve; 3.1.5 Thixotropy
3.1.6 Effect of Heterogeneity in Shear Rate3.2 Wall Slip; 3.2.1 Physical Origin; 3.2.2 General Mechanical Characteristics; 3.2.3 Couette Flow; 3.2.4 Parallel Disks; 3.2.5 Cone-Plate Flow; 3.2.6 Capillary Flows; 3.2.7 Wall Slip, Yielding, and Fracture; 3.2.8 How to Avoid Wall Slip; 3.3 Shear Localization; 3.3.1 Plateau in Flow Curve and Viscosity Bifurcation; 3.3.2 Modeling; 3.3.3 Shear Banding; 3.3.4 Implications for Paste Rheometry in the Continuum Regime; 3.3.5 Paste Rheometry in the Discrete Regime; 3.4 Surface Tension Effects; 3.4.1 Surface Tension in Simple Liquids
3.4.2 Surface Tension for Non-Newtonian Liquids3.5 Drying; 3.5.1 Evaporation; 3.5.2 Drying Regimes; 3.5.3 Drying Rates during Rheometrical Tests; 3.5.4 Effect of Drying on Rheometry; 3.5.5 Countermeasures; 3.6 Phase Separation; 3.6.1 Sedimentation; 3.6.2 Migration; 3.6.3 Segregation; 3.6.4 Consequences in Rheometry; 3.7 Cracking; 3.8 Temperature Effects; 3.9 Inertia Effects and Turbulence; 3.9.1 "Macroscopic" Inertia Effects; 3.9.2 Turbulence; References; 4 LOCAL RHEOMETRY; 4.1 Techniques for Measuring the Velocity Field in Fluids; 4.1.1 Principles of NMR; 4.1.2 Principles of MRI
4.1.3 Principles of MRI Velocimetry

Sommario/riassunto

A comprehensive examination of rheometry theory and its practical applicationsThis publication enables readers to understand and characterize the flow properties of complex fluids and, with this knowledge, develop a wide range of industrial and consumer products. The author fills a gap in the current literature by presenting a comprehensive description of the rheological behavior of pastes, suspensions, and granular materials and by offering readers the rheometrical techniques needed to effectively characterize these materials.With his extensive experience in both academic and