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Titolo	Non-Equilibrium Thermodynamics in Multiphase Flows // by Roberto Mauri
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ISBN	94-007-5461-2
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (271 p.)
Collana	Soft and Biological Matter, , 2213-1736
Disciplina	536.7
Soggetti	Thermodynamics Physical chemistry Amorphous substances Complex fluids Fluid mechanics Statistical physics Dynamical systems Polymers Physical Chemistry Soft and Granular Matter, Complex Fluids and Microfluidics Engineering Fluid Dynamics Complex Systems Polymer Sciences
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	From the Contents: Microscopic reversibility -- The Langevin equation -- The Fokker-Planck equation -- Stochastic differential calculus -- The path integral -- Balance equations -- The constitutive relations -- Multiphase Flows -- Effective constitutive relations -- Multiple scale analysis.
Sommario/riassunto	Non-equilibrium thermodynamics is a general framework that allows the macroscopic description of irreversible processes. This book introduces non-equilibrium thermodynamics and its applications to the rheology of multiphase flows. The subject is relevant to graduate students in chemical and mechanical engineering, physics and material

science. This book is divided into two parts. The first part presents the theory of non-equilibrium thermodynamics, reviewing its essential features and showing, when possible, some applications. The second part of this book deals with how the general theory can be applied to model multiphase flows and, in particular, how to determine their constitutive relations. Each chapter contains problems at the end, the solutions of which are given at the end of the book. No prior knowledge of statistical mechanics is required; the necessary prerequisites are elements of transport phenomena and on thermodynamics. "The style of the book is mathematical, but nonetheless it remains very readable and anchored in the physical world rather than becoming too abstract. Though it is up-to-date and includes recent important developments, there is a lot of classical material in the book, albeit presented with unprecedented clarity and coherence. The first six chapters are actually a very good introduction to the theory underlying many phenomena in soft matter physics, beyond the focus on flow and transport of the later chapters of the book." Prof Richard A.L. Jones FRS, Pro-Vice-Chancellor for Research and Innovation, University of Sheffield.
