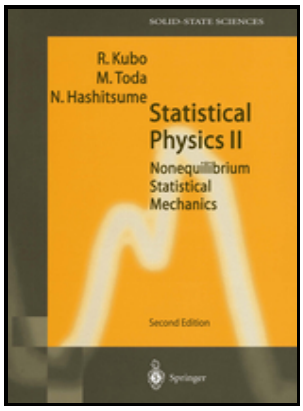
Nonequilibrium statistical mechanics of open and closed systems

VCH Publishers - [2005.08627v1] Classical non



Description: -
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Law -- History.
Law -- Canada -- History.
Chemistry, Physical and theoretical.
Nonequilibrium statistical mechanics.
Open systems (Physics)nonequilibrium statistical mechanics of open and closed systems
-nonequilibrium statistical mechanics of open and closed systems
Notes: Includes bibliographical references (p. 418-431).
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Tags: #Non

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When these 'cells' are defined, one admits that matter and energy may pass freely between contiguous 'cells', slowly enough to leave the 'cells' in their respective individual local thermodynamic equilibria with respect to intensive variables. Modern Thermodynamics: From Heat Engines to Dissipative Structures.

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This is the extended Massieu potential.

Non

Entropy and the Time Evolution of Macroscopic Systems. Consequently, this approach can deal with only a very limited range of phenomena.

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This approach assumes spatial and temporal continuity and even differentiability of locally defined intensive variables such as temperature and internal energy density.

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The approximation that constitutes classical irreversible thermodynamics is built on this metaphoric thinking. If free energies are very useful in equilibrium thermodynamics, it must be stressed that there is no general law defining stationary non-equilibrium properties of the energy as is the second law of thermodynamics for the in equilibrium thermodynamics. Another top expert offers an extensive discussion of the possibilities for principles of extrema of entropy production and of dissipation of energy: Chapter 12 of Grandy 2008 is very cautious, and finds difficulty in defining the 'rate of internal entropy production' in many cases, and finds that sometimes for the prediction of the course of a process, an extremum of the quantity called the rate of dissipation of energy may be more useful than that of the rate of entropy production; this quantity appeared in

Onsager's 1931 origination of this subject.

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For classical non-equilibrium studies, we will consider some new locally defined intensive macroscopic variables. Field Theory and Variational Principles, translated from the Hungarian 1967 by E. The Unity of Science and Economics: A New Foundation of Economic Theory.

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If these two relaxation times are not well separated, then the classical non-equilibrium thermodynamical concept of local thermodynamic equilibrium loses its meaning and other approaches have to be proposed, see for instance. Then it strictly obeys Kirchhoff's law of equality of radiative emissivity and absorptivity, with a black body source function. This article is an attempt to sketch some approaches to it and some concepts important for it.

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Shepherd, New York, Consultants Bureau. Statistical Thermodynamics of Nonequilibrium Processes, Springer-Verlag, New York,.

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