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Nota di contenuto	Contents ; Preface ; 0.1 Who is addressed and why ; 0.2 A necessary clarification ; 0.3 Acknowledgment ; Chapter 1 Introduction ; 1.1 Phase transitions and thermodynamics in ""Small"" Systems ; 1.2 Boltzmann gives the key 1.3 Micro-canonical Thermodynamics describes non-extensive systems 1.4 Some realistic systems: Nuclei and atomic clusters ; 1.5 Plan of this book ; Chapter 2 The Mechanical Basis of Thermodynamics: ; 2.1 Basic definitions ; 2.2 The thermodynamic limit the global concavity of s(e n) 2.3 Phase transitions micro-canonically 2.4 Second Law of Thermodynamics and Boltzmann's entropy ; Chapter 3 Micro-canonical thermodynamics of Phase Transitions studied in the Potts model ; 3.1 Introduction ; 3.2 The surface tension in the Potts model. [GEZ50] 3.3 The topology of the entropy surface S(E N) for Potts lattice gases [GV99] 3.4 On the origin of isolated critical points and critical lines

; Chapter 4 Liquid-gas transition and surface tension under constant pressure ; 4.1

Andersen's constant pressure ensemble ;

4.2 Micro-canonical ensemble with given pressure

The enthalpy

4.3 Liquid-

gas transition in realistic metal systems

; 4.4 The relation to the method of the Gibbs-ensemble

; 4.5 Alternative microscopic methods to calculate the surface tension

; 4.6 Criticism and necessary improvements of the computational method

4.7 Conclusion

Sommario/riassunto

Boltzmann's formula $S = \ln[W(E)]$ defines the microcanonical ensemble. The usual textbooks on statistical mechanics start with the microensemble but rather quickly switch to the canonical ensemble introduced by Gibbs. This has the main advantage of easier analytical calculations, but there is a price to pay - for example, phase transitions can only be defined in the thermodynamic limit of infinite system size. The question how phase transitions show up from systems with, say, 100 particles with an increasing number towards the bulk can only be answered when one finds a way
