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Nota di contenuto	Cover; Title Page; Copyright Page; Contents; Principal Symbols; 1. Mechanical Molecular Models; 1.1 Introduction; 1.2 Molecular mechanics; 1.3 Capillary phenomena; 1.4 The internal energy of a liquid; 1.5 The continuous surface profile; 1.6 The mean molecular field; 2. Thermodynamics; 2.1 Thermodynamics and kinetic theory; 2.2 The thermodynamics of the surface; 2.3 Surface functions; 2.4 The spherical surface; 2.5 Quasi-thermodynamics-a first look; 3. THE THEORY OF VAN DER WAALS; 3.1 Introduction; 3.2 The surface tension; 3.3 Independently variable densities 3.4 Gibbs adsorption equation in the van der Waals theory3.5 Constraints on the range of fluctuations; 4. Statistical Mechanics of the Liquid-Gas Surface; 4.1 Introduction; 4.2 Distribution and correlation functions; 4.3 The pressure tensor; 4.4 The virial route to the surface tension; 4.5 Functionals of the distribution functions; 4.6 The surface tension from the direct correlation function; 4.7 Equivalence of the two expressions for the surface tension; 4.8 The spherical surface; 4.9 Density fluctuations and their correlation; 4.10 Local thermodynamic

functions

5. Model Fluids in the Mean-Field Approximation 5.1 Introduction: mean-field theory of a homogeneous fluid of attracting hard spheres; 5.2 Liquid-gas interface in the model of attracting hard spheres; 5.3 Lattice-gas model: one component; 5.4 Lattice-gas model: two components; 5.5 Penetrable-sphere model: theory; 5.6 Penetrable-sphere model: applications; 5.7 Penetrable-sphere model: spherical surfaces; 6. Computer Simulation of the Liquid-Gas Surface; 6.1 The experimental background; 6.2 The methods of computer simulation; 6.3 The density profile; 6.4 The surface tension; 6.5 Further work 7. Calculation of the Density Profile 7.1 Introduction; 7.2 Solution of the YBG equation; 7.3 Approximations for the direct correlation function; 7.4 Modified van der Waals theories; 7.5 Perturbation theories; 7.6 Surface tension; 8. Three-Phase Equilibrium; 8.1 Introduction; 8.2 Contact angles and Neumann's triangle; 8.3 Spreading and Antonow's rule; 8.4 The Interface; 8.5 Phase transitions in interfaces. The Cahn transition; 8.6 Three-phase line and line tension; 9. Interfaces Near Critical Points; 9.1 Introduction: mean-field approximation 9.2 Digression on the Ornstein-Zernike theory of the pair-correlation function 9.3 Digression on critical-point exponents; 9.4 Van der Waals theory with non-classical exponents; 9.5 Tricritical points; 9.6 Non-critical interface near a critical endpoint; 9.7 Renormalization-group theory; field-theoretical models; Appendix 1 Thermodynamics; Appendix 2 Dirac's delta-function; Name Index; Subject Index

Sommario/riassunto

<DIV> <DIV>History of thought on molecular origins of surface phenomena offers a critical and detailed examination and assessment of modern theories, focusing on statistical mechanics and application of results in mean-field approximation to model systems. Emphasis on liquid-gas surface, with a focus on liquid-liquid surfaces in the final chapters. 1989 edition.</DIV></DIV>
