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Autore	Petsev D. N (Dimiter Nikolov), <1962->
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Nota di contenuto	1. Introduction : a historical overview -- 1.1. Charges and fields -- 1.2. Electrostatics of systems with distributed charges -- 1.3. The concept of electric double layer part I. Theory. 2. The origin of charge at interfaces involving electrolyte solutions -- 2.1. Effects of the surface chemical reactions and the charge regulation model -- 2.2. Effects due to physical adsorption -- 2.3. Structural effects on the ionic and solvent concentration at the interface 3. Continuum models of the electric double layers -- 3.1. The Poisson-Boltzmann equation -- 3.2. Electric double layer models based on the Poisson-Boltzmann equation : exact and approximate solutions -- 3.3. Beyond the Boltzmann distribution : the semiconductor-electrolyte interface -- 3.4. Electrokinetic phenomena -- 3.5. Deficiencies of the continuum approach 4. Integral equation theory -- 4.1. Background -- 4.2. Percus-Yevick closure -- 4.3. The hypernetted-chain closure -- 4.4. The mean spherical approximation (MSA) -- 4.5. Hard sphere mixtures -- 4.6. The Ornstein-Zernike equations approach to studying electric double layers

Sommario/riassunto

The electrical double layer describes charge and potential distributions that form at the interface between electrolyte solutions and the surface of an object, and they play a fundamental role in chemical and electrochemical behaviour. Colloid science, electrochemistry, material science, and biology are a few examples where such interfaces play a crucial role. The focus of this book is on the application of modern liquid state theories to the properties of electric double layers, where it demonstrates the ability of statistical mechanical approaches, such as

the classical density functional theory, to provide insights and details that will enable a better and more quantitative understanding of electric double layers. The book will be essential reading for advanced students and researchers in interfacial science and its numerous applications.