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Summary of Electrostatic Equations in Free Space; 3.2.1 Integral Form; 3.2.2 Differential Form; 3.3 Electrostatic Classification of Materials; 3.4 Basic Electrostatics in Dielectrics; 3.5 Boundary Conditions for Electrostatic Equations
3.6 Maxwell Stress for a Linear Dielectric3.7 Maxwell's Equations of Electromagnetism; 3.8 Nomenclature; 3.9 References; CHAPTER 4 APPLICATION OF ELECTROSTATICS; 4.1 Two-Dimensional Dielectric Slab in an External Electric Field; 4.1.1 Electric Potential and Field Strength; 4.1.2 Polarization Surface Charge Density; 4.1.3 Maxwell Electrostatic Stress; 4.2 A Dielectric Sphere in an External Electric Field; 4.2.1 Electric Potential and Field Strength; 4.2.2 Polarization Surface Charge Density; 4.2.3 Maxwell Electrostatic Stress on the Dielectric Sphere
4.3 A Conducting Sphere in an External Electric Field4.3.1 Electric Potential and Field Strength for a Conducting Sphere; 4.3.2 Surface Charge Density for a Conducting Sphere; 4.3.3 Maxwell Electrostatic Stress on the Conducting Sphere; 4.4 Charged Disc and Two Parallel Discs in a Dielectric Medium; 4.5 Point Charges in a Dielectric Medium; 4.6 Nomenclature; 4.7 Problems; 4.8 References; CHAPTER 5 ELECTRIC DOUBLE LAYER; 5.1 Electric Double Layers at Charged Interfaces; 5.1.1 Origin of Interfacial Charge; 5.1.2 Electrical Potential Distribution Near an Interface
5.1.3 The Boltzmann Distribution5.2 Potential for Planar Electric Double Layer; 5.2.1 Gouy-Chapman Analysis; 5.2.2 Debye-Huckel Approximation; 5.2.3 Surface Charge Density; 5.2.4 Ionic Concentrations in Electric Double Layers; 5.2.5 High Surface Potentials and Counterion Analysis; 5.3 Potential for Curved Electric Double Layer; 5.3.1 Spherical Geometry: Debye-Huckel Approximation; 5.3.2 Cylindrical Geometry: Debye-Huckel Approximation; 5.4 Electrostatic Interaction between Two Planar Surfaces; 5.4.1 Force between Two Charged Planar Surfaces
5.4.2 Surface Charge Density for Planar Surfaces: Overlapping Double Layers

Sommario/riassunto

A new, definitive perspective of electrokinetic and colloid transport processesResponding to renewed interest in the subject of electrokinetics, Electrokinetic and Colloid Transport Phenomena is a timely overview of the latest research and applications in this field for both the beginner and the professional. An outgrowth of an earlier text (by coauthor Jacob Masliyah), this self-contained reference provides an up-to-date summary of the literature on electrokinetic and colloid transport phenomena as well as direct pedagogical insight into the development of the subject over the past se