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Integral Analysis; 2.9.2 Point Analysis; 2.10 Summary; 2.11 Exercises; Bibliography; 3 Flow Equations; 3.1 Introduction
3.2 Darcy's Experiments3.3 Fluid Properties; 3.4 Equations of State for Fluids; 3.4.1 Mass Fraction; 3.4.2 Mass Density and Pressure; 3.4.3 Fluid Viscosity; 3.5 Hydraulic Potential; 3.5.1 Hydrostatic Force and Hydraulic Head; 3.5.2 Derivatives of Hydraulic Head; 3.6 Single-Phase Fluid Flow; 3.6.1 Darcy's Law; 3.6.2 Hydraulic Conductivity and Permeability; 3.6.3 Derivation of Groundwater Flow Equation; 3.6.4 Recapitulation of the Derivation; 3.6.5 Initial and Boundary Conditions; 3.6.6 Two-Dimensional Flow; 3.7 Two-Phase Immiscible Flow; 3.7.1 Derivation of Flow Equations
3.7.2 Observations on the p(c)-s(w) Relationship3.7.3 Formulas for the p(c)-s(w) Relationship; 3.7.4 Observations of the k()(rel)-s(w) Relationship; 3.7.5 Formulas for the k()(rel)-s(w) Relation; 3.7.6 Special Cases of Multiphase Flow; 3.8 The Buckley-Leverett Analysis; 3.8.1 Fractional Flow; 3.8.2 Derivation of the Buckley-Leverett Equation; 3.8.3 Solution of the Buckley-Leverett Equation; 3.9 Summary; 3.10 Exercises; Bibliography; 4 Mass Transport Equations; 4.1 Introduction; 4.2 Velocity in the Species Transport Equations; 4.2.1 Direct Approach; 4.2.2 Rigorous Approach
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5.2.1 Primary DNAPL Imbibition in Homogeneous Soil

Sommario/riassunto

Learn the fundamental concepts that underlie the physics of multiphase flow and transport in porous media with the information in Essentials of Multiphase Flow in Porous Media, which demonstrates the mathematical-physical ways to express and address multiphase flow problems. Find a logical, step-by-step introduction to everything from the simple concepts to the advanced equations useful for addressing real-world problems like infiltration, groundwater contamination, and movement of non-aqueous phase liquids. Discover and apply the governing equations for application to these and other p