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Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Autore	Chilingar George V. <1929->
Titolo	Electrokinetics for petroleum and environmental engineers / / George V. Chilingar, Mohammed Haroun
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Classificazione	SCI024000
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Soggetti	Secondary recovery of oil Electricity in petroleum engineering Petroleum - Electric properties Electrokinetics
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Formato	Materiale a stampa
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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Cover; Half Title page; Title page; Copyright page; Dedication; Foreword; List of Contributors; Chapter 1: Introduction to Electrokinetics; 1 Introduction; 1.1 Factors Influencing Electrokinetic Phenomena; 1.2 Zeta Potential and the Electric Double Layer Interaction; 1.3 Coehn's Rule; 1.4 Combined Flow Rate Equation; 1.5 Dewatering of Soils; 1.6 Use of Electrokinetics for Stabilization of Week Grounds; 1.7 Bioelectroremediation; 1.8 Electrical Enhanced Oil Recovery (EEOR); 1.9 Improving Acidizing of Carbonates; 1.10 Economic Feasibility; 1.11 Releasing Stuck Drillpipe; 1.12 Summary Bibliography Chapter 2: Reduction of Contaminants in Soil and Water By Direct Electric Current; 2.1 Introduction; 2.2 Overview of Direct Electric Current in Subsurface Environmental Mitigation; 2.3 Electrokinetically-Aided Environmental Mitigation; 2.4 Transport and Extraction of Crude Oil; 2.5 Summary and Conclusions; References; Chapter 3: Application of Electrokinetics for Enhanced Oil Recovery; 3.1 Introduction; 3.2

Petroleum Reservoirs, Properties, Reserves, and Recoveries; 3.3 Relative Permeability and Residual Saturation; 3.4 Enhanced Oil Recovery
3.5 Electrokinetically Enhanced Oil Recovery 3.6 DCEOR and Energy Storage; 3.7 Electro-chemical Basis for DCEOR; 3.8 Role of the Helmholtz Double Layer; 3.9 DCEOR Field Operations; 3.10 DCEOR Field Demonstrations; 3.11 Produced Fluid Changes; 3.12 Laboratory Measurements; 3.13 Technology Comparisons; 3.14 Summary; Nomenclature; References; Websites; Chapter 4: EEOR in Carbonate Reservoirs; 4.1 Introduction; 4.2 Electrically Enhanced Oil Recovery (EEOR) - EK Assisted WF; 4.3 SMART (Simultaneous/Sequential Modified Assisted Recovery Techniques)
4.4 (SMART EOR) Electrokinetic-Assisted Nano-Flooding/Surfactant-Flooding4.5 Electrokinetics-Assisted Waterflooding with Low Concentration of HCl; 4.6 Effect of EEOR and SMART EOR in Carbonate Reservoirs at Reservoir Conditions; 4.7 Economics; Conclusions; Nomenclature; References; Chapter 5: Mathematical Modeling of Electrokinetic Transport and Enhanced Oil Recovery In Porous Geo-Media; 5.1 Introduction; 5.2 Basics of EK Transport Modeling; 5.3 Fundamental Governing Equations; 5.4 Mathematical Model and Solution of Ek Transport; 5.5 EK Mass Transport Models
5.6 Coupling of Electrical and Pressure Gradients 5.7 Mathematical Modeling of EKEOR; 5.8 Fundamental Governing Equations for EKEOR Model; 5.9 Solution Strategy; 5.10 Numerical Implementation; 5.11 Summary; References; Index

Sommario/riassunto

"Electrokinetics is a term applied to a group of physicochemical phenomena involving the transport of charges, action of charged particles, effects of applied electric potential and fluid transport in various porous media to allow for a desired migration or flow to be achieved. These phenomena include electrokinetics, electroosmosis, ion migration, electrophoresis, streaming potential and electroviscosity. These phenomena are closely related and all contribute to the transport and migration of different ionic species and chemicals in porous media. The physicochemical and electrochemical properties of a porous medium and the pore fluid, and the magnitudes of the applied electrical potential all impact the direction and velocity of the fluid flow. Also, an electrical potential is generated upon the forced passage of fluid carrying charged particles through a porous medium.The use of electrokinetics in the field of petroleum and environmental engineering was groundbreaking when George Chilingar pioneered its use decades ago, but it has only been in recent years that its full potential has been studied. This is the first volume of its kind ever written, offering the petroleum or environmental engineer a practical "how to" book on using electrokinetics for more efficient and better oil recovery and recovery from difficult reservoirs.This groundbreaking volume is a must-have for any petroleum engineer working in the field, and for students and faculty in petroleum engineering departments worldwide. "--