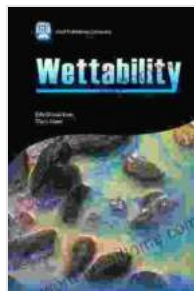


# Wettability: Unleashing the Potential for Enhanced Hydrocarbon Recovery

Wettability is a fundamental surface property that plays a critical role in determining the behavior of fluids in porous media. In the realm of petroleum engineering, understanding and controlling wettability is essential for maximizing hydrocarbon recovery and optimizing reservoir performance. Erle Donaldson's seminal work, "Wettability," provides an unparalleled guide to this complex and multifaceted subject.



**Wettability** by Erle C. Donaldson

★★★★★ 5 out of 5

Language : English

File size : 10894 KB

Text-to-Speech : Enabled

Enhanced typesetting : Enabled

Print length : 454 pages

Screen Reader : Supported

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## Chapter 1: The Fundamentals of Wettability

Donaldson begins by establishing the basic principles of wettability, including the concepts of contact angle, surface tension, and interfacial phenomena. He explains the influence of surface chemistry on wettability and how different wettability preferences can arise between various fluids and solid surfaces. This chapter lays the foundation for understanding the more complex aspects of wettability.

## **Chapter 2: Wettability Measurement Techniques**

Accurately measuring wettability is crucial for reservoir characterization and predicting fluid flow behavior. Donaldson discusses a wide range of wettability measurement techniques, from classical methods like the Amott test to advanced techniques such as contact angle goniometry and nuclear magnetic resonance imaging. He provides detailed instructions and insights into the strengths and limitations of each method.

## **Chapter 3: Wettability Alteration and Control**

The ability to alter or control wettability is a powerful tool for optimizing hydrocarbon recovery. Donaldson explores various methods of wettability modification, including chemical additives, surface treatments, and thermal techniques. He discusses the mechanisms behind these methods and provides guidelines for their successful implementation.

## **Chapter 4: Wettability in Oil Recovery**

Wettability plays a profound impact on oil recovery processes. Donaldson delves into the influence of wettability on capillary pressure, relative permeability, and displacement efficiency. He explains how different wettability scenarios can lead to varying degrees of hydrocarbon recovery and discusses the implications for reservoir management.

## **Chapter 5: Wettability in Enhanced Oil Recovery**

Enhanced oil recovery (EOR) techniques rely heavily on manipulating wettability to improve hydrocarbon recovery. Donaldson examines the role of wettability in EOR methods such as waterflooding, surfactant flooding,

and polymer flooding. He provides insights into the mechanisms of wettability alteration during these processes and discusses the potential for enhancing oil recovery.

## **Chapter 6: Wettability in Reservoir Engineering**

Understanding wettability is essential for reservoir engineers to make informed decisions about fluid flow and recovery strategies. Donaldson discusses the importance of wettability in reservoir characterization, modeling, and simulation. He provides practical guidelines for incorporating wettability data into reservoir engineering workflows.

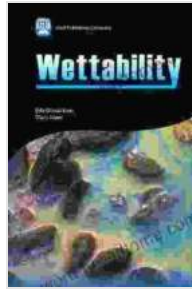
## **Chapter 7: Case Studies and Applications**

To illustrate the practical relevance of wettability, Donaldson presents a series of case studies from around the world. These case studies showcase the successful application of wettability modification techniques to enhance hydrocarbon recovery in various reservoir settings. The case studies provide valuable lessons and insights for petroleum engineers.

Erle Donaldson's "Wettability" is an indispensable resource for anyone seeking to understand and harness the power of wettability in the field of petroleum engineering. Its comprehensive coverage, clear explanations, and practical applications make it an essential reference for professionals and students alike. By mastering the concepts and techniques presented in this book, readers can unlock the full potential of wettability for enhanced hydrocarbon recovery and reservoir optimization.

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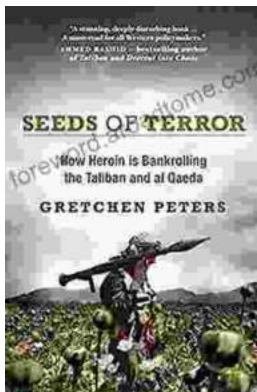
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