

Preface

Physics of Petroleum Reservoirs, as one of the fundamental courses in petroleum engineering and related majors, is widely used in many fields, such as geological research, geophysical exploration, drilling engineering, oil/gas production and so on. To promote the development of such an important course, bilingual teaching is indispensable so as to help students quickly master the basic technique vocabulary, improve their English application ability, and lay a foundation for their study on the subsequent bilingual courses. For further consideration, bilingual teaching on this course can also broaden the students' horizon on the international trend of this subject and guides them to enter the related research fields as early as possible, therefore in accordance with the urgent need in China's petroleum industry for large numbers of internationalized application-oriented professionals.

However, in the practice of bilingual teaching in this course, there are too few bilingual textbooks for teachers and students to use at present. The lack of an appropriate bilingual textbook of this course has been suffered for years in Southwest Petroleum University. In view of this, the authors, based on their years' experience engaging in the bilingual teaching of this course, come out with this bilingual textbook specially. When composing this textbook, authors not only consult some original teaching materials abroad, but also take the students' knowledge levels and capacities into fully consideration. Besides the basic knowledge, this course requires, the textbook also covers some frontier theories and latest developments in this subject; hence, its strong practicability and pertinence can well satisfy the demands in bilingual teaching. This book is written to be a textbook for undergraduates who major petroleum engineering, resources exploration engineering and other relevant majors, or a reference book for oilfield engineers.

The book focuses the attributes of petroleum reservoirs, the important physical and chemical phenomena, and physical processes occurring in petroleum production. To specify, there are four chapters in this book. Chapter 1 addresses the physical properties of reservoir rocks. Chapter 2 discusses the physical properties of reservoir fluids. Chapter 3 presents the microscopic mechanism of multiphase fluids flowing through rocks. And Chap. 4 is a simple introduction to the principles

of enhanced oil recovery. Considering the depth and breadth, the book mainly introduces the basic concepts, primary theories, common test items and methods in oilfield development. Through the book, students can understand the important properties of petroleum reservoirs with their applications on petroleum engineering, at the same time learn the principles and methods of measuring these physical properties as well as the required experimental skills; ultimately, lay a solid foundation for their following courses and practical work in the future.

The textbook is arranged to meet the need of 48–56 class hours. Due to the limitation of space and the adaptability for undergraduates, some topics in this subject cannot be deeply discussed. Interested readers may refer to related literatures and books.

This textbook is organized into five chapters. Xuetao Hu writes most of the book, mainly including the Preface, Chaps. 1, 2, 3 and Sect. 4.1 of Chap. 4. The rest of Chap. 4 is written by Shuyong Hu and Chap. 5 by Fayang Jin. Su Huang (from Southwest Oil and Gas Field Company, CNPC) participates in the writing of the Preface, Chap. 1 and sections of Chap. 2; and help to translate the Foreword and review the whole book in English. Xuetao Hu edits all the drafts.

We are especially indebted to Prof. Shilun Li for taking time to carefully review this book and write the Foreword, also to the leaders and teachers from Southwest Petroleum University and the School of Oil & Natural Gas Engineering, who offered strong support and great assistance in the completion of this book. As the textbook of a vital fundamental course, it inherits the advantages and absorbs the essence of various related textbooks published in different times both at home and abroad; numerous references including published and unpublished are cited, and some of them failed to be listed for some reason. Great appreciation goes to all of them.

International System of Units (SI system) is dominating in this book, whereas the system of imperial units is customarily used in the world. This book retains imperial system in some parts as well, wishing to help readers gain an international view. Therefore, it is advised that readers pay more attention to the units.

The study on Physics of Petroleum Reservoirs is ever developing. While this book is being written, innovations may take place in laboratories and oilfields throughout the world. Limited by time and the authors' level, the latest technologies and methods may not be presented completely, and omissions and shortcomings inevitable. Criticism and suggestions are always welcome.

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