

中国石油地质志 卷三

# 辽河油田

辽河油田石油地质志编写组 编

石油工业出版社

中国石油地质志 卷三

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辽河油田石油地质志编辑委员会 编

石 油 工 业 出 版 社

# 中国石油地质志编辑委员会

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## 序

中国是石油和天然气资源丰富的国家。900多年前，我国著名学者沈括（1031~1095年）就首创石油一词，并作出“石油至多，生于地中无穷”的科学论断。勤劳智慧的中华民族对油气的开发利用有着悠久的历史，早在两千年前的汉代，我国劳动人民就在四川凿井开采天然气，并用于制盐。

我国近代石油工业开始于1878年。1887年在台湾省开设矿油局，经营台湾的油气开采。然而由于漫长的封建制度的束缚，以及近百年来帝国主义列强的侵略，我国石油工业的发展极其艰难缓慢，到1949年，年产石油仅10多万吨。

新中国成立后，我国石油工业发展很快，30多年来，从西部的挤压型盆地到东部的拉张型盆地开展了大规模油气勘探，至今共做地震测线100多万公里，钻探井和开发井6万多口。在17个省、市、自治区发现200多个油气田，其中包括大庆特大型油田和任丘古潜山油田。目前全国已建成16个油气工业基地。1987年年产石油达一亿三千四百万吨，跃居世界第四位产油国。

与世界其它产油国家不同的是，中国现有的石油绝大部分产自陆相沉积岩。这一成功的实践，证明陆相地层也能生成大量烃类，而且可以形成大油气田和大油气区。

这些年来，勘探工作做得最多的是许多中新生代含油气盆地。中国的中新生代盆地具有其独特的风格，它们都是陆相沉积盆地，而且多数均叠加在古生代海相沉积盆地之上，形成复杂的含油气盆地格局，蕴藏着丰富的油气资源。

30多年来，我们发现了为数可观的油气储量，积累了勘探陆相油气田的丰富经验和大量宝贵的石油地质资料，同时还发展了具有中国特色的石油地质科学，其中包括陆相有机质成烃演化、湖相沉积体系、复式油气聚集带以及油气资源评价等一整套理论和方法。此外，对海相碳酸盐岩裂缝型油气田的勘探和开发也积累了比较丰富的经验。

《中国石油地质志》是有关我国石油勘探实践和经验的系列著作，也是建国以来第一次系统记述中国油气勘探历程和成果的专门丛书。它的出版将从一个侧面反映出30年来我国油气勘探事业的巨大成就。

我国的含油气盆地还有许多未经开拓的领域。出版《中国石油地质志》将有助于我们利用已有的认识和经验，更有效地去探索新的油气领域。这对进一步发展我国的石油天然气工业和石油地质科学技术均有十分重要的价值。

《中国石油地质志》共分十六卷，是按当前各油田、勘探局及石油公司所在行政区，并考虑构造单元的一致性划分的，各分卷按以下顺序排列：

- |    |         |
|----|---------|
| 卷一 | 总论      |
| 卷二 | 大庆、吉林油田 |
| 卷三 | 辽河油田    |
| 卷四 | 大港油田    |
| 卷五 | 华北油田    |
| 卷六 | 胜利油田    |

卷七	中原、南阳油田
卷八	苏浙皖闽油气区
卷九	江汉油田
卷十	四川油气区
卷十一	滇黔桂油气区
卷十二	长庆油田
卷十三	玉门油田
卷十四	青藏油气区
卷十五	新疆油气区
卷十六	沿海大陆架及毗邻海域油气区

《中国石油地质志》是我国广大石油地质工作者劳动成果的结晶。其编著工作是在全国各油田、勘探局及石油公司的专家和研究人员的积极参加下进行的，并得到石油工业部的领导和有关司局、石油勘探开发科学研究院以及石油工业出版社的大力支持，这是全书编写工作能够顺利进行的有力保证。在此，谨向有关单位和同志们表示衷心的感谢。

需要指出的是，由于各盆地（地区）勘探程度不同，地质条件很不一样，因此分卷的内容各有所侧重，但都是根据编委会的统一要求和安排，从实际出发，力求如实写出区域地质和石油地质特征。今后随着勘探程度及认识水平的不断提高，还将给予充实和完善。

中国石油地质志编委会  
1987年 北京

# 前 言

位于辽宁省下辽河拗陷的辽河油田是 1955 年开始普查勘探、1965 年发现、70 年代投入开发的新兴石油工业基地。它是渤海湾含油气区的重要组成部分，是位于辽东湾之滨的一颗石油明珠。经过近 30 多年的油气勘探开发，特别是 1984 年以后的大发展，辽河油田目前已建成为一个年产 1335 万吨原油的大型油田——全国第三大油田。

下辽河拗陷油气资源十分丰富，地质构造十分复杂，辽河油田是典型的断块油田。总结以往的勘探成果，认识断块油田的地质规律和形成油气藏的条件，对指导复式油气藏的勘探有重要的意义。辽河石油勘探局根据统一部署组织部分有丰富实践经验的石油地质工作者着手编纂该地区的石油地质志，他们既是事件的策划者，又是事件的直接参加者和总结者，能够正确反映事件发生、发展的全过程。通过对大量资料的系统整理、归纳和分析研究，完成了本书的初稿。初稿完成后聘请程克明、沈成喜、高维亮、张清等进行审阅，提出修改补充意见。本卷资料截止时间到 1988 年底，部分延伸到 1989 年，力求能够反映最新成果。

本志共分二篇，第一篇是对下辽河拗陷的沉积、构造发育特征，油、气、水分布规律，油气生成及油气藏形成条件和控制因素的全面论述，并对这一地区的油气资源进行了评价，分析了勘探的方向。第二篇是对下辽河拗陷外围中生代沉积盆地的分析和评价，从石油地质学的角度来论述这些盆地作为下辽河拗陷油气勘探的重要后备战略地区的意义和价值。

本卷是由辽河石油勘探局石油地质志编辑委员会负责撰写的，其中第一篇编写分工为：第一、二章蒋宝铤，第三章申绍文，第四章于天欣，第五、七章李应暹，第六章许杏娟，第八章宋少英，第九章熊崇珏，第十、十二章吴铁生，第十一章牛仲仁、张学汝、盛和宜、季诚兴、王碧省、周联华、郑容植、李忠利、王桂珍、陈和平、徐东祥等，第十三章葛泰生。第二篇由王公肃编写（其中第一章由蒋宝铤编写）。

陈义贤、朴明植、赵庆波参加了部分工作。本卷图幅由辽河石油勘探局勘探开发研究院制图室清绘。

本卷定稿时，由葛泰生进行全面审定修改，蒋宝铤进行文字的统一和修改，最后中国石油地质志编委会张清统阅全稿。

本卷力求能够比较全面地反映该区石油勘探的历史进程，沉积盆地的基本地质结构和有关石油地质的一系列基本观点和成果，以期能作为重要的参考文献，对石油工业的今后发展能有所借鉴，但由于条件所限，虽几经修改，文中错、漏之处在所难免，敬希读者批评指正。

该卷在编写过程中除参考有关单位、个人的资料外，主要根据辽河石油勘探局近年来大量工作成果报告及有关数据综合编写而成。

在此谨向关心、支持、协助本志编写工作以及引用资料的单位和个人表示衷心的感谢。

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## PREFACE

China has rich resources of petroleum and natural gas. More than 900 years ago, Shen Kuo (1031–1095 A. D. ), a great scientist of the Song dynasty, created the word “Shiyou (Petroleum )” for the first time, and he reached a scientific conclusion that “petroleum is lying underground in enormous quantities.” China’s ingenious people also have a long history of developing and utilizing oil and gas. As early as the Han dynasty, 2000 years ago, Chinese people had drilled wells to recover natural gas as the fuel material for making salt in Sichuan.

The modern Chinese petroleum industry started from 1878. In 1887, a mineral–oil department was set up to manage oil and gas resource in Taiwan province. The Chinese petroleum industry, however, developed very slowly and with terrible difficulties, due to thousands of years of feudalism and a century of aggression from imperialist countries. By 1949, the annual output of crude oil was only 120000 tons (876000 barrels) .

After the founding of the People’s Republic of China, the national petroleum industry has been rapidly developed. Over 36 years, a large scale oil and gas exploration was implemented in both compressive depressions in the west and rift basins in the east. The work included more than one million kilometers of seismic line and over 60000 wildcat and production wells. More than 200 oil and gas fields have been discovered in 17 provinces, municipalities and autonomous regions including Daqing’s giant oil field and Renqiu’s buried hill oil field. Up to now, China has 16 large oil and gas industry bases. In 1987, annual oil production reached 134 million tons (987. 2 million barrels) , and China became the fourth biggest oil production country in the world.

Unlike that from other oil production countries, most of the oil recovered in China is from nonmarine sedimentary rocks. This proves that continental source rocks can generate large amounts of hydrocarbon to form big oil and gas fields as well as big oil–gas provinces.

In the past 36 years, most of our exploration has been on Meso–Cenozoic oil bearing basins. These basins in China have special characteristics, that is, they are all continental sedimentary basins and most of them superimposed on Paleozoic marine sedimentary basins to form complex oil and gas bearing basins, in which there are rich oil and gas resources.

We have discovered a large amount of oil and gas reserves, and have gained enormous experience and a great deal of useful petroleum geological data on the exploration of continental oil and gas fields. We have developed a series of methods and theory of petroleum geology, including the transformation from continental organic matter to hydrocarbons, lacustrine sedimentary systems, composite oil and gas accumulations and the evaluation of oil and gas resources, etc. In addition, we have rich experience in exploring and developing fractured oil and gas fields in marine carbonate rocks.

“**Petroleum Geology of China**” is a series about the practice and experience of exploration



in China. It contains petroleum geological data and knowledge from all the main oil and gas basins and areas favourable for exploration both on-shore and off-shore. It is the first series to publish systematically this type of works covering the history and results of China's petroleum exploration since the founding of the People's Republic of China, and it will show the great achievements of the oil and gas exploration of our country.

Some large areas in oil and gas bearing basins in China have not still been developed. The publication of "**Petroleum Geology of China**" will be of great help in discovering new oil and gas bearing areas through the utilization of the knowledge and experience we have obtained. It also will be of a great value for the further development of petroleum and natural gas industry and technology of petroleum geology of our country.

Based on the administrative regions in which oil fields, exploration bureau and petroleum companies are located, and taking into consideration of geological tectonic units, "**Petroleum Geology of China**" is divided into 16 volumes, as follows:

- Vol.1. Introduction
- Vol.2. Daqing, Jilin Oil Field
- Vol.3. Liaohe Oil Field
- Vol.4. Dagang Oil Field
- Vol.5. Huabei Oil Field
- Vol.6. Shengli Oil Field
- Vol.7. Zhongyuan, Nanyang Oil Field
- Vol.8. Jiangsu-Zhejiang-Anhui and Fujian
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- Vol.10. Sichuan Oil & Gas Field
- Vol.11. Yunnan-Guizhou-Guangxi
- Vol.12. Changqing Oil Field
- Vol.13. Yumen Oil Field
- Vol.14. Qinghai-Tibet
- Vol.15. Xinjiang
- Vol.16. Oil & Gas Bearing Areas on the Continental Shelf and Its Neighbouring Regions

"**Petroleum Geology of China**", compiled by scientists and experts from many departments all over the country, is a fruit of collective efforts. In the course of compilation and publication, we have had much help and support provided by the leaders of the Ministry of Petroleum Industry and its departments, the Research Institute of Petroleum Exploration & Development, and Petroleum Industry Press. We wish to acknowledge our deep gratitude to all people and organizations which joined in and supported the work here.

Although each volume has its own emphasis due to the different exploration history and geological conditions of each basin (region), they all try to give readers clear and reliable information and views of the characteristics of the regional and petroleum geology, and will be added to and enhanced as exploration and scientific knowledge improves.

**Editorial Committee of "Petroleum Geology of China"**

**Beijing, P.R.C., 1987.**

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# 第一篇 下辽河坳陷



## 第二篇 下辽河拗陷外围盆地

