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中國石油地質誌

PETROLEUM GEOLOGY  
OF CHINA VOL. 5

中国石油地质志 卷五

# 华北油田

华北油田石油地质志编写组 编



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## 华北油田石油地质志编写组

唐 智 吴华元 高维亮 秦珂琳 刘 毅

## 序

中国是石油和天然气资源丰富的国家。早在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。这一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,从西部的挤压盆地到东部的拉张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,而且多数均迭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辖行政区,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
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- 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

1975年发现了任丘潜山大油田，产油层是古老的中元古界海相碳酸盐岩。油气富集，单井日产油量可达千吨以上。这个油田的发现，不仅为我国建成又一个年产千万吨以上的油区打下基础，也为充实和发展中国石油地质理论作出了贡献。十年来，通过大量的勘探工作，又相继在河北、内蒙地区发现了一批油气田，实践进一步证明，华北油田所属含油气区资源丰富，前景广阔，本油气区的发现和建成将以其特殊的意义载入中国石油史册。

近十年来，各方面的专家对华北油田所属含油气区的石油地质特点和规律，先后从各个侧面进行了论述。但从系统性和完整性来衡量尚嫌不足。本志的编写就是为了满足这个要求。本志是在华北石油勘探开发研究院生油研究室、沉积研究室、碳酸盐岩研究室、油田地质研究室、油藏研究室和油田开发研究室所提供的最新科研成果的基础上，编写而成的。

遵循“实践—认识—再实践—再认识”的观点，本文涉及到的对地质规律的论述和含油气前景的评价，只能代表现阶段的认识程度，不可能也不应该被看作是“定论”。随着勘探、开发和建设工作量的不断增长，再过一个时期（譬如五年或十年），人们对华北石油地质规律的认识将又提高到一个新的水平。

本志的主要执笔人是高维亮，直接参与工作的有吴忠良、程鸣芳。全文经吴华元技术审定，负责人是唐智。

本志的技术审定工作是分章进行的，参加第一篇审定的各方面专家有：赵克敬、梁生正、王致和（第二章），蒋协光、平学聪、蔡治国（第三章），吴继龙、陈炳华、武思训（第四章），史习慧、秦建中（第五章），秦云龙、谢天阔、周玉兰（第三、六章），赵宝忠、党振荣、刘秉义（第七章），李功治（第八章），范泰雍（第八、九章），黄守诚、王光润（第九章），秦珂琳、余家仁、刘毅等（第十章），梁生正、蒲大忠（第十一章），王兴世、谢恭俭（第二篇），李顺才（第三篇）。

附图由华北石油研究院制图室清绘。高超同志在文字方面作了一些修改，田秉钧、陈琼景及杨声碧同志参加了部分文字誊清工作，谨一并在此致以深切的谢意！

由于资料浩瀚，各家均有所长，本志的编写很难达到完善的境界，也难以作到博采众长，挂一漏万在所难免，敬请指正。



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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 that year, 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 new 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 new 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 冀中坳陷

