

Research Advances**Important Achievement and Advance of Natural Gas Geology and Geochemical Exploration in China**SUN Yuzhuang^{*}

*Key Laboratory of Resource Exploration Research of Hebei Province, Hebei University of Engineering,
Handan 056038, Hebei, China*

Academician Dai Jinxing has long been engaged in natural gas geology and geochemical researches, and has made prominent contributions to the establishment and development of China's theory of coal-derived gas. He has opened up new areas of coal-derived gas exploration, natural gas formation theory and formation & control conditions of large & medium gas fields. Erik Galimov, a world's famous geochemist, academician of the Russian Academy of Sciences commended Academician Dai Jinxing upon "being one of the outstanding scientists in areas of world natural gas geology and geochemistry".

To celebrate Academician Dai Jinxing for his eightieth birthday, a special column was jointly published by Academician Dai Jinxing and his students in the magazine of *Energy Exploration & Exploitation* (Vol. 32, No. 1 2014). This special column published 13 articles, one of which was personally written by Academician Dai Jinxing, and the rest were finished by his students. These papers mainly cover the following four aspects: the formation mechanism of China's large gas field & geochemical characteristics of natural gas, exploration potential of deep-stratum natural gas, geochemical characteristics of unconventional natural gas (tight gas) and application of isotope kinetics fractionation for light hydrocarbon and hydrogen, and introduce the important achievements and progress made in the fields of natural gas geology, geochemistry and exploration in China in recent years. Five articles of them discussed the natural gas origins of China's large gas fields (the volume of reserves exceeds $1000 \times 10^8 \text{ m}^3$), made comparisons of source gas, and analyzed the formation mechanism and main controlling factors of large gas fields by mainly using natural gas components, carbon & hydrogen isotopes and other geochemical indicators. Gas can be divided into coal-derived gas and oil-related gas, biogas, inorganic gas and mixture gas, and researches suggest that natural gas in large gas fields are mainly composed of coal-derived gas. The study on formation mechanism

of natural gas in large fields is not only of great significance for the migration & gathering of natural gas as well as optimization for exploration targets, but also provides a scientific basis for the rapid development of China's natural gas industry. The exploration and development of deep-stratum reservoir in China is an important research orientation. This special column has conducted a comprehensive and in-depth research on the controlling factors for the accumulation of deep-stratum oil gas, and has pointed out the exploration potential of deep-stratum reservoirs in China. In recent years, unconventional oil gas, especially tight sandstone gas has attracted wide attention from academia and industrial fields and occupied an important position in China's natural gas industry. Special column has also conducted in-depth researches, deeply discussed the geochemical characteristics and formation mechanism of tight sandstone gas. They pointed out that the tight sandstone gas should give priority to coal-derived gas, while coal measures strata are considered as favorable exploration targets. They also believed that natural gas from the Sulige gas field—China's largest coal-derived gas field, is defined as short-distance accumulation without long-distance migration.

To sum up, the special column has collected and condensed China's important achievements, arguments and progress on natural gas geology, geochemistry and exploration in recent years. What's more, it closely follows the academic forefront and has made in-depth researches on some cutting-edge issues, such as deep-stratum oil gas potential, geochemical characteristics of unconventional oil gas, the application of Isotope kinetic fractionation of light hydrocarbon hydrogen, etc., which has provided scientific and theoretical basis for the rapid development of China's natural gas industry and has important guiding significance for the future research of natural gas. The publication of this special column has evoked important repercussion in academia.

^{*} Corresponding author. E-mail: syz@hebeu.edu.cn