The development of experimental technique for natural gas biomarker and its application

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Biomarker can provides much important information for oil and gas formation and occurrence such as paleoenviroment, hydrocarbon mother material, hydrocarbon generating evolution, hydrocarbon migration, oil/gas-source rock correlation and hydrocarbon alternation. Because of the low content of biomarker in natural gas, the research on natural gas biomarker is relative seldom. From 1990's on, the RIPED-Langfang has done a lot of researches on biomarker in natural gas and gradually built an experimental technique for natural gas biomarker. In the article the process of development and its application are introduced as follow: (1) Firstly, by analyzing the advantages and disadvantages between absorption and freezing method for natural gas biomarker, the freezing method are adopted; (2) Secondly, the biomarkers in some typical natural gases（coal-formed gas and oil-formed gas） are detected, furthermore, the foundation of natural gas biomarker tracing source are proved; (3) thirdly, some parameters which can be considered as new indicators for gas-source correlation such as C_{19} tricyclic terpane/C_{23} tricyclic terpane, C_{26} tricyclic terpane/C_{24} tetracyclic terpane are selected; (4) Fourthly, combing new indicators and carbon isotopes value of natural gas, the genetic identification models of natural gases is built; (5)Finally, the model is applied in genetic quantitative identification of natural gas in Ordos basin [1-3]. The development and application of experimental technique for natural gas biomarkers is of great guiding significance in gas-source rock correlation and gas reservoir formation.

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The CO_2 degassing during contact metamorphism from south Tan-Lu fault belt: Its geological significance

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Introduction

Inorganic CO_2 pools in East China have been paid much attention with the further oil and gas exploration in oil-gas basins in the recent decade [1]. In fact, a number of CO_2 pools (or CO_2-spring spots) were discovered in the basins scattering along the Tan–Lu fault belt [2]. Chinese geologists have been showing much interest in CO_2 pools in East China both theoretically and practically [3]. The fluid inclusion study of Dabie orogenic belt adjacent to south Tan-Lu fault also shows the mantle genetic CO_2 degassing [4]. This paper focuses mainly on the division of different metamorphic zones and calculation of CO_2 degassing during the metamorphism with mathematical and geological models from the Shuangshan metamorphic region in south Tan-Lu fault belt.

Results

The calculated results show that the amount of CO_2 degassing was controlled by the characteristics of the country rocks, including thermal conductivity, penetrability, porosity and connectivity. Compositions, size and depth of intrusive rocks also have an important influence on CO_2 degassing, generated numerous cracks in country rocks, thus allowed the easy flow and fluid accumulation. The amount of CO_2 flux in contact metamorphism is quantitatively analyzed and calculated on the basis of metamorphic reaction and time–integrated fluid flux.

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