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Determination of Acidolysis Hydrocarbons in Oil/Gas Geochemical Exploration Sample By Gas Chromatograph

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1 Introduction

Although a numerous of papers were reported for the chemical or instrumental analysis of inorganic elements for the geochemical samples (Sun and Xie, 2014; Sun et al., 2014; Rao et al., 2004). However, the analytical methods for acidolysis hydrocarbons in geochemical exploration sample were scarce (He et al., 2011; Chen et al., 2012; Standard, 2003).

In this paper, a method of acidolysis hydrocarbons analysis in oil/gas geochemical sample by Autosampler-GC-FID has been developed. The acidolysis hydrocarbons equipment has been improved, and the method is suitable for batch processing to improve the analytical efficiency. A method was adopted under the condition of vacuum at 40 °C water bath for the acidolysis hydrocarbons pretreatment, and the acidolysis reaction time is 5 ~ 10 min for about 20 g sample. The detecting instrument was AOC5000 Autosampler-GC-2010 gas chromatography with HP-PLOT Al₂O₃/KCl capillary column. The typical gas chromatogram peaks for acidolysis hydrocarbons in the gas hydrate area sample shows in Figure 1. The optimization of main analytical conditions and quality assessment and control were discussed in details. Detection program can be completed within 6min, and autosampler vial with 98 injection place, greatly improving the efficiency of the analysis. The detection limits of the method for the acidolysis hydrocarbons is 0.055 ~ 0.209 μL/kg, and the precision of the method is 0.85% ~ 1.11% (RSD). The relative deviation of two independent test results for 105 samples is between 0.01% and 16.42% (methane). The method provides the advantages of high-efficiency and reliability, and it can meet the requirement of determination of acidolysis hydrocarbons in oil/ and gas geochemical sample. The

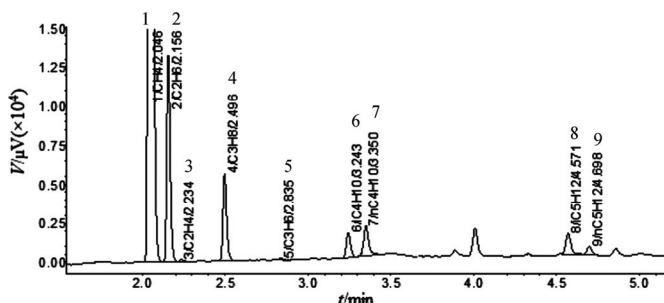


Fig. 1. The gas chromatogram of acidolysis hydrocarbons in the gas hydrate area sample.

1, methane; 2, ethane; 3, ethene; 4, propane; 5, propene; 6, isobutane; 7, butane; 8, isopentane; 9, pentane.

method has been applied to a great quantity real sample analysis with the satisfactory results for geochemical exploration of gas hydrates.

Key words: gas-chromatography; acidolysis hydrocarbons; natural gas hydrate; Geochemical sample

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References

- Chen Weiming, Xu Renting, Li Qingxia, Xiao Xilian, Bo Wei and Zhang Qin, 2012. An Analysis of Light Hydrocarbons by Gas Chromatography and its Application in Natural Gas Hydrate. *Geophysical & Geochemical Exploration*, 36(5): 775–782.
- He Xingling, Zhu Zhigang and Zhang Yuanyuan, 2011. The Analytical Method For Acidolysis Hydrocarbons in Marine Sediments. *Geophysical & Geochemical Exploration*, 35(6):

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- 825–828.
- Rao Zhu, Wang Yaping, LiSong and Qi Peng, 2004. The Analysis of Light Hydrocarbons in Marine Sediments by Gas Chromatography. *Rock and Mineral Analysis*, 23(4): 256–259.
- Stanard SY/T 6009.1-2003. Test method of samples of geochemical exploration for oil and gas. Part 1: Determination of acidolysis hydrocarbons Gas Chromatography. 2003.
- Zhongjun Sun and Xuejing Xie, 2014. Nationwide oil and gas geochemical exploration program in China. *Journal of Geochemical Exploration*, 139: 201–206.
- Zhongjun Sun, Zhibin Yang, HaiMei, Aihua Qin, Fugui Zhang, YalongZhou, Shun Yao Zhang, and Bowen Mei, 2014. Geochemical characteristics of the shallow soil above the Muli gashydrate reservoir in the permafrost region of the Qilian Mountains, China. *Journal of Geochemical Exploration*, 139: 160–169.