

# Varian's Gasohol Analyzer

FOR THE ANALYSIS OF ALCOHOLS AND ETHERS IN GASOLINES



*Varian offers a range of GC analyzers to measure oxygenates in various hydrocarbon streams. Varian's Gasohol Analyzer provides refineries with the ability to optimize gasoline production by measuring alcohol and ether content more rapidly and with increased confidence.*

## Key Benefits

- ▶ **The ideal choice for the analysis of oxygenated additives in gasoline.** The Varian Gasohol Analyzer is a 'turnkey' solution for the analysis of oxygenated additives in gasoline. All operational parameters including gas flows are tuned and set at the factory and the system is shipped with the actual method. The Analyzer is suited to the analysis of ethers and alcohols in gasolines and light naphtha.
- ▶ **A comprehensive, single vendor solution.** Varian provides complete solutions without the use of third parties. The hardware, software, application optimization, documentation, installation and performance verification are all provided by Varian, offering an all inclusive and convenient analysis solution.
- ▶ **Based on outstanding hardware, software and column technology.** The Gasohol Analyzer incorporates Varian's popular 450-GC, Galaxie™ data handling software and its advanced capillary column technology in a system that is very powerful but extremely easy to use.
- ▶ **Dual mode operation.** Varian's Gasohol Analyzer has two modes of operation. The wide range mode measures ethers (MTBE, TAME) and all C1 to C4 alcohols with BP up to 100 °C and is most suitable for gasoline with low olefinic content. The 'MTBE' mode is more suitable for highly olefinic gasoline with optimized separation of MTBE and low boiling oxygenates.
- ▶ **Unrivalled repeatability and retention times.** By using either the 8400 or 8410 automatic liquid samplers, not only is a high degree of run-to-run repeatability obtained but also high sample analysis throughput to keep up with the demands placed on today's refinery laboratory.

NOTICE: This document contains references to Varian. Please note that Varian, Inc. is now part of Agilent Technologies. For more information, go to [www.agilent.com/chem](http://www.agilent.com/chem).

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Figure 1 depicts a separation of alcohols and ethers in high olefinic gasoline. By operating the Gasohol Analyzer in wide range mode, the ethers (MTBE, TAME) and all C1-C4 alcohols are determined. However, when utilizing the MTBE mode, MTBE and lower boiling point oxygenates, (with the exception of TAME and 1-butanol) can be determined.

## Peak Identification

- |                 |   |
|-----------------|---|
| 1. cyclo-Hexane | 7. Ethanol                                  |
| 2. MTBE         | 8. MEK (normally used as Internal Standard) |
| 3. TAME         | 9. 2-Butanol                                |
| 4. Methanol     | 10. 1-Propanol                              |
| 5. t-Butanol    | 11. iso-Butanol                             |
| 6. iso-Propanol | 12. 1-Butanol                               |

## Specifications

**Analysis Time:** Up to 20 minutes.

**Minimum Detectability:** Typically 100 ppm per component.

**Dynamic Range:**  $10^6$ . Please note, due to the possibility of column overload, the maximum concentration for individual oxygenated components is limited to 30 %. For critical separations at extremely high levels, some loss in peak resolution can be expected.

**Accuracy:** The methods either use external or internal standard calibration. Internal standard is recommended (1,4 dioxane or MEK may be used as internal standard). Therefore, analytical accuracy is related to the accuracy and quality of the calibration standard sample and the repeatability of the analyzer.

**Repeatability:** Retention time repeatability is typically better than 0.03 mins. RSD (using an automatic liquid sampler) and peak area count repeatability typically 2 % RSD or better at 1 % concentration level.

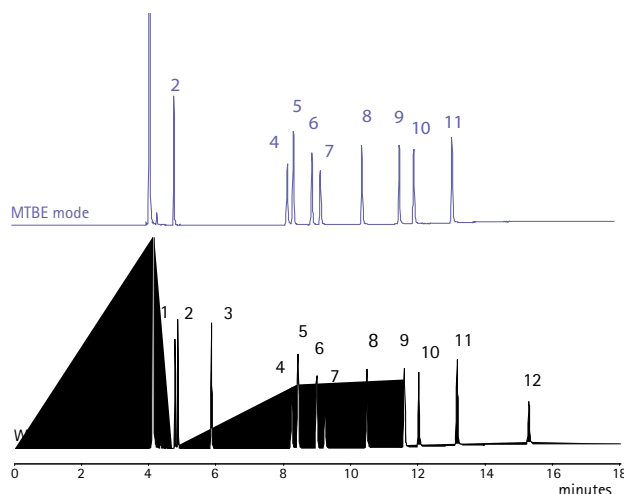


Figure 1. Separation of alcohols and ethers in high olefinic gasoline.

## Hardware Configuration

- Single channel, multi-dimensional, capillary column configuration, based on the 450 chromatograph.
- Injection: split/splitless capillary injector.
- Detection: Flame Ionization Detector (FID).
- Full Electronic Flow Control (EFC).
- CP-8400 or CP-8410 Autosampler (highly recommended).

