

JAS GCxGC

JAS Solution for GCxGC Comprehensive Chromatography



JAS offers a **patented solution for GCxGC Comprehensive Chromatography**. This two-dimensional separation technique is used to

perform qualitative analysis of complex samples. Typical application areas are petrochemicals, flavor and fragrances, environmental science, forensics as well as clinical and biological samples. The advantage of GCxGC compared to conventional gas chromatography is a vastly-expanded separation space. As a result, chromatographic resolution and sensitivity are strongly improved.

Two analytical columns with different separation properties (non-polar and polar) are used in series to improve analytical separation of complex mixtures. Analytes of interest eluted from the first column are collected and periodically injected at a regular interval into the second column by means of a modulator device. The second column has to be short for high speed operation in order to ensure complete separation of one injected fraction before the next collected sample fraction is injected.

Other GCxGC systems include modulation options operating on rapid changes of heating and cooling the collector. JAS GCxGC system uses a solenoid controlled valve as modulation option to control the flow of eluted analytes from the first column to the second column with high precision and repeatability. Costly coolant for cryogenic trapping is not necessary.

JAS GCxGC-system includes two collectors operating alternately (Figure 1). While the trapped fragments of collector 1 are transferred to column 2 the other collector is filled with the effluent of column 1. This enables the analyst to separate the effluent of column 1 into small fragments in order to obtain chromatograms of high resolution. Sampling time and modulation period is freely configurable. Obtained data are illustrated in form of a 2-dimensional chromatogram (contour plot) with the X-axis representing retention on column 1 and the Y-axis representing retention on column 2. Peak identification is provided by special JAS GCxGC software.

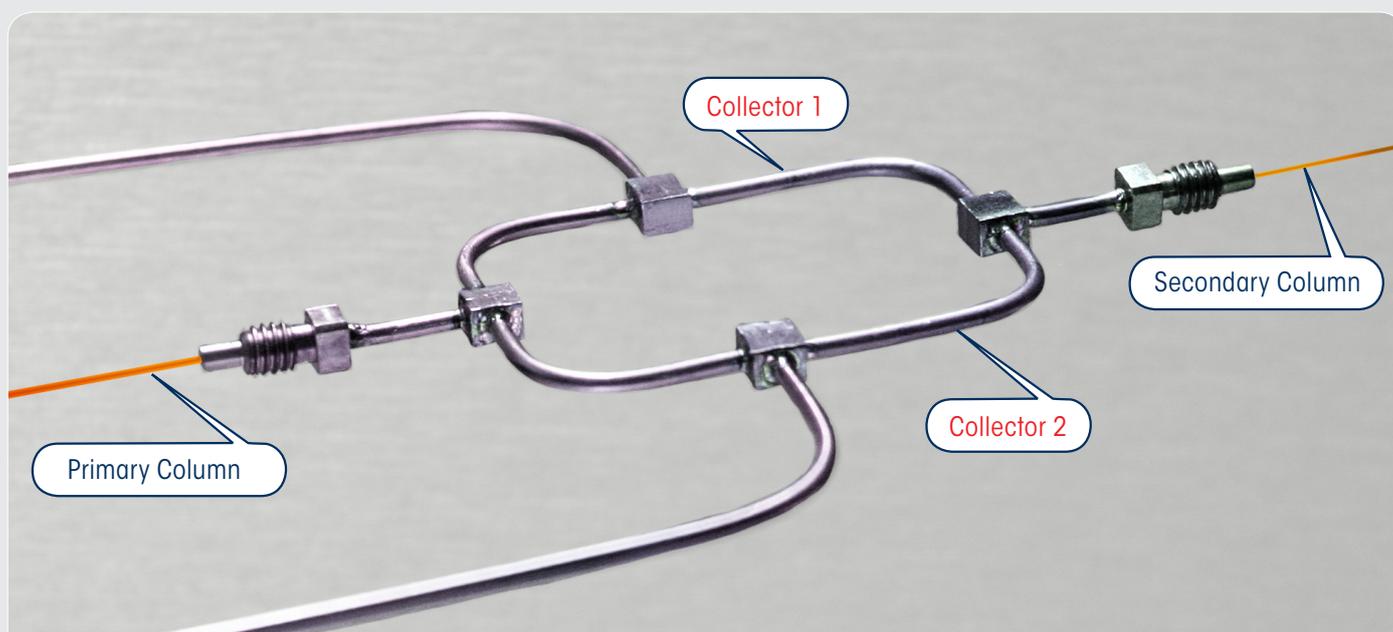


Figure 1: JAS GCxGC System

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The capabilities of JAS GCxGC are demonstrated by analyzing diesel (Figure 2). Because of the high sample complexity diesel causes co-elutions in a conventional chromatogram. Thus, qualitative information cannot be obtained. By means of GCxGC hydrocarbon class separation can be visualized in a 2-dimensional chromatogram (contour plot).

The 3-dimensional format gives information about the relative intensity of present compounds (Figure 3). The analyst is able to rotate this plot and look at the results from any angle. Obtained results are listed in a peak table, including retention time.

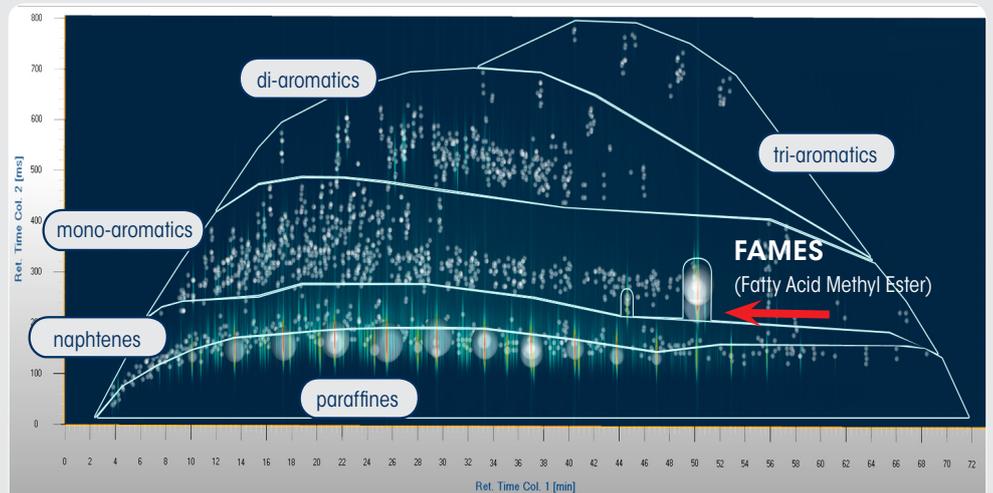


Figure 2: 2-dimensional contour plot of a diesel sample

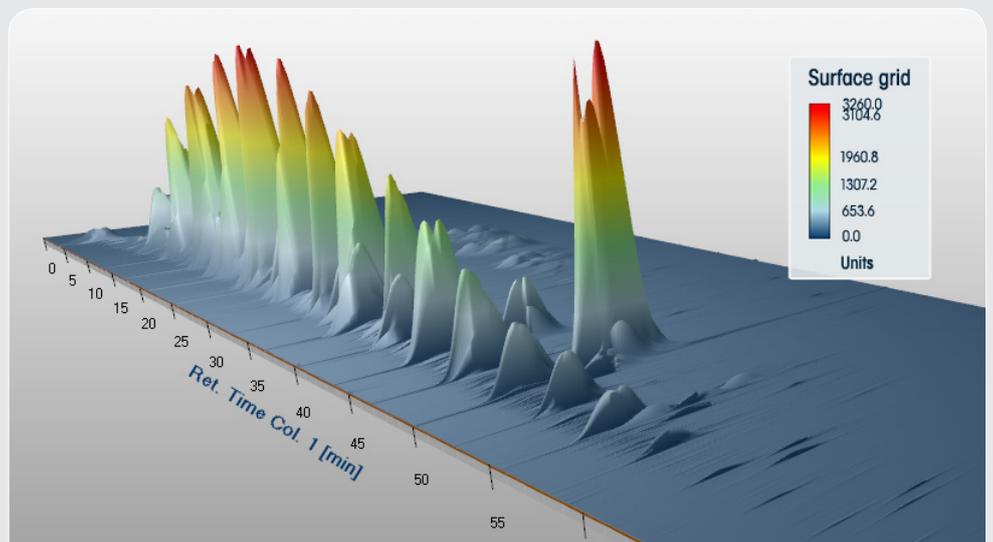


Figure 3: 3-dimensional presentation of GCxGC fragment pattern of diesel

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