IP585 Determination of Fatty Acid Methyl Esters (FAME) from biodiesel in aviation turbine fuel

NEW

Biodiesel is the most commonly used alternative fuel. It is made via conversion of vegetable and animal fats into fatty acid methyl esters (FAMEs). This fundamental difference between biodiesel and hydrocarbon-based petroleum diesel imparts properties to the biodiesel such as a high freezing point (- 5 °C) and poor oxidative stability that render it unsafe in jet fuel - for example, at low temperatures, biodiesel forms wax crystals that can clog fuel lines and filters.

IP585 FAME in Aviation Turbine Fuel

IP-585-BCS **1 mL**

1,000 µg/g each in n-Dodecane 6 comps.

- Palmitic acid methyl ester
- Heptadecoaoic acid methyl ester
- Stearic acid methyl ester
- Methyl cis-9-octadecenoate
- Linoleic acid methyl ester
- Linolenic acid methyl ester

Internal Standard

IP-585-IS **1 mL**

1,000 mg/kg in n-Dodecane

- Methyl heptadecanoate-d33

Cloud Point

ASTM D2500

Cloud Point	-16	˚C	B5	**BF-D-2500-B5-250ML**	250 mL
	-14	˚C	B20	**BF-D-2500-B20-250ML**	250 mL
	-1	˚C	B100	**BF-D-2500-B100-250ML**	250 mL

These are nominal values and the actual value will be recorded on the certificate.

Visit our website for for complete listing of standards and view Biofuel Analysis brochure at

https://www.accustandard.com/biofuels-brochure

Technical information available on following pages

IP585 – Determination of fatty acid methyl esters (FAME) from bio-diesel in aviation turbine fuel.

Biodiesel is the most commonly used alternative fuel. Despite its suitability as an alternative fuel, it possesses physical and chemical parameters that disqualify it for use in aviation fuels. Biodiesel is made via conversion of vegetable and animal fats into fatty acid methyl esters (FAMEs). This fundamental difference between biodiesel and hydrocarbon-based petroleum diesel imparts properties to the biodiesel such as a high freezing point (- 5 °C) and poor oxidative stability that render it unsafe in jet fuel – for example, at low temperatures, biodiesel forms wax crystals that can clog fuel lines and filters.

To analyze jet fuel for biodiesel contamination, the Energy Institute has developed a GC/MS selective ion monitoring/scan detection method designated as IP-585(1). Per this method, the allowable limit for a cross-contamination level of biodiesel FAME in commercial jet fuel A-1 is 50 ppm.

Jet fuel is a complex mixture of hydrocarbons with a broad boiling point range. Subsequently, it is not always possible to separate the polar FAME compounds from the hydrocarbon matrix. A remedy for this problem is to separate the samples on a polar phase capillary column using single ion monitoring detection.

The method lists a lengthy, 50-60 meters, polyethylene glycol (carbowax) type capillary column for the analyses. This type of column phase is considered "polar" and interactions with the FAMEs results in longer column retention times than the non-polar hydrocarbon components of the jet fuel.

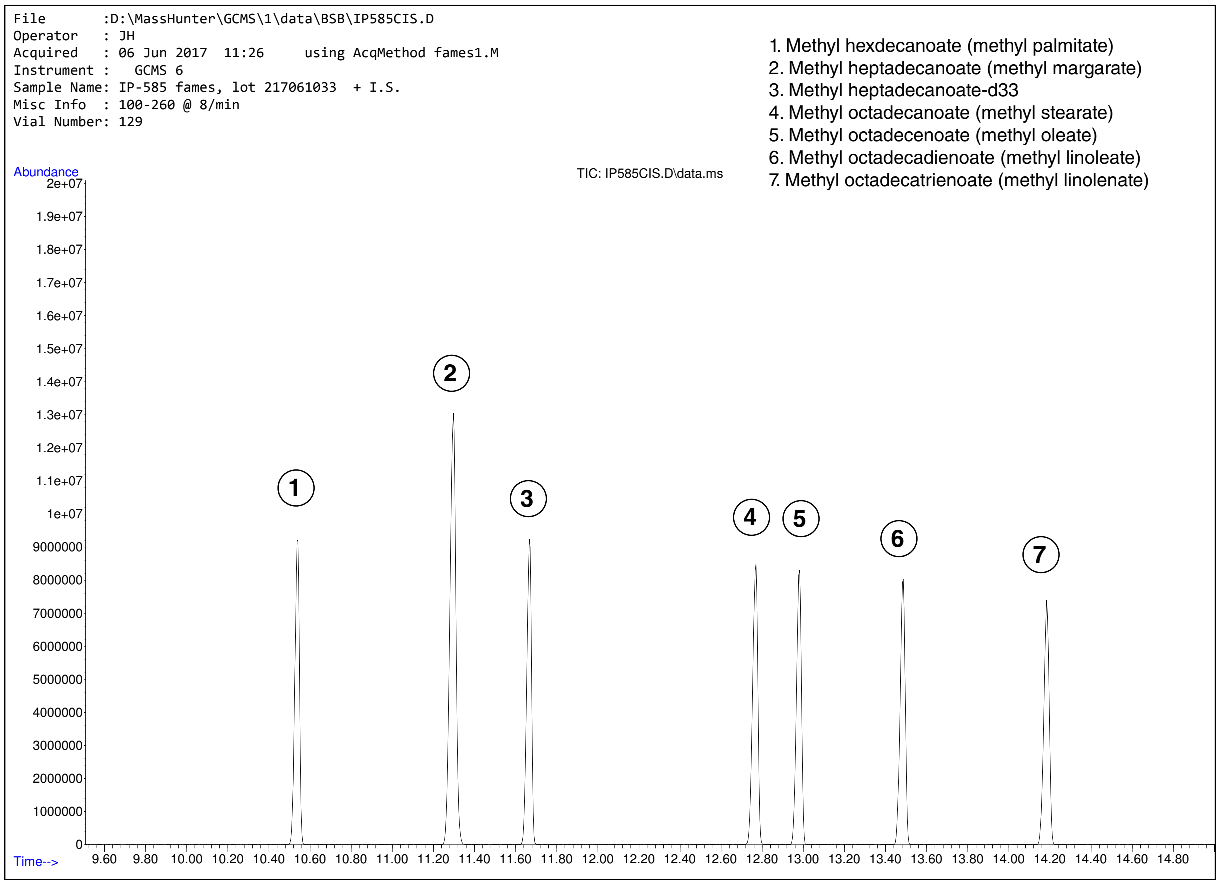

Figure 1 depicts the separation of the seven component FAME mix and the internal standard on the carbowax column.

A common practice in many environmental analyses is to use a confirmation GC column to corroborate and validate the separation/analysis. In this case, another type of polar phase capillary column utilizing a cyanopropyl/phenyl silicone stationary phase was used to confirm the separation of the FAME mix. This silicone phase is less susceptible to moisture and has better thermal stability than the carbowax phase.

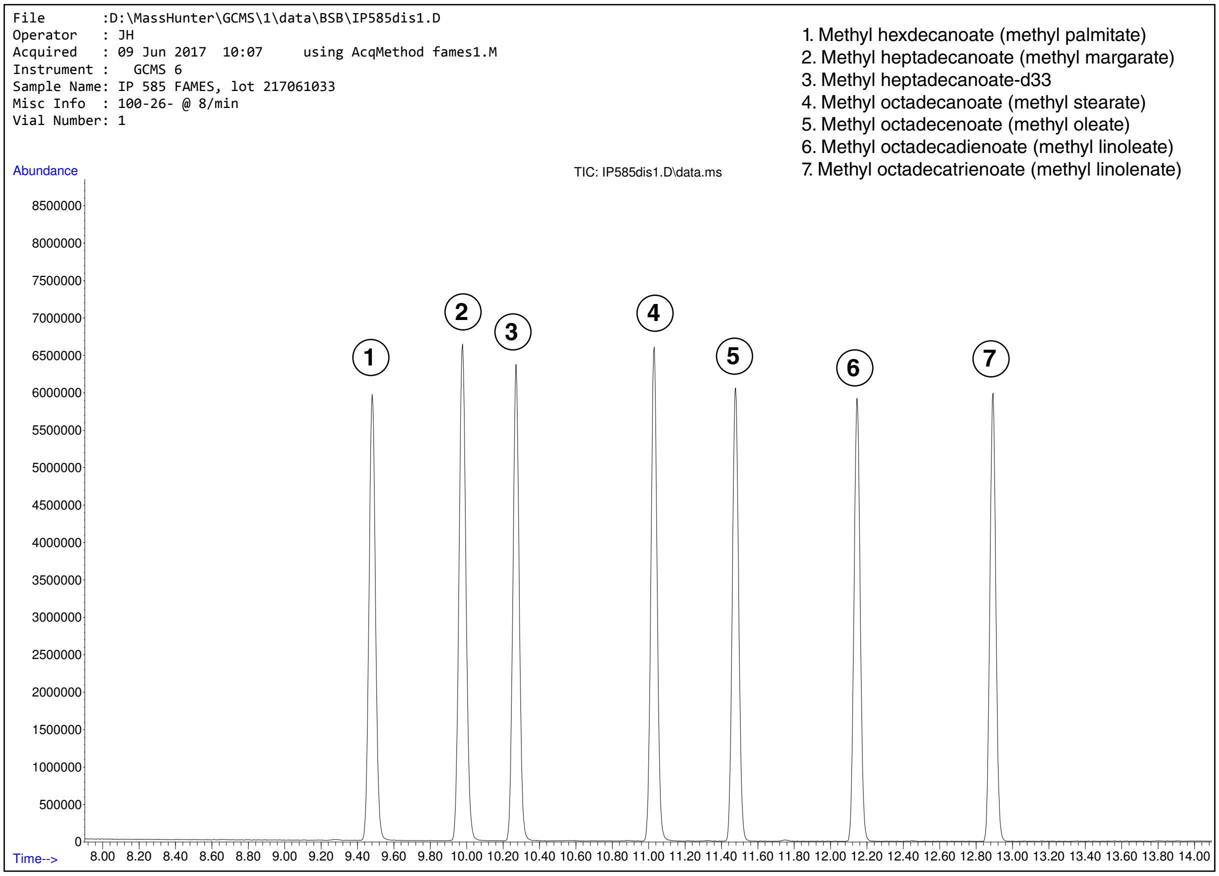

Figure 2 illustrates the separation of the same FAME mix as in Figure 1.

AccuStandard offers the IP-585 seven component FAME mixture as well as the individual components and internal standard. For more detailed information please visit our website at www.accustandard.com.

Reference:

(1) IP585/10 Determination of fatty acid methyl esters (FAME) derived from bio-diesel fuel, in aviation turbine fuel - GC/MS with selective