

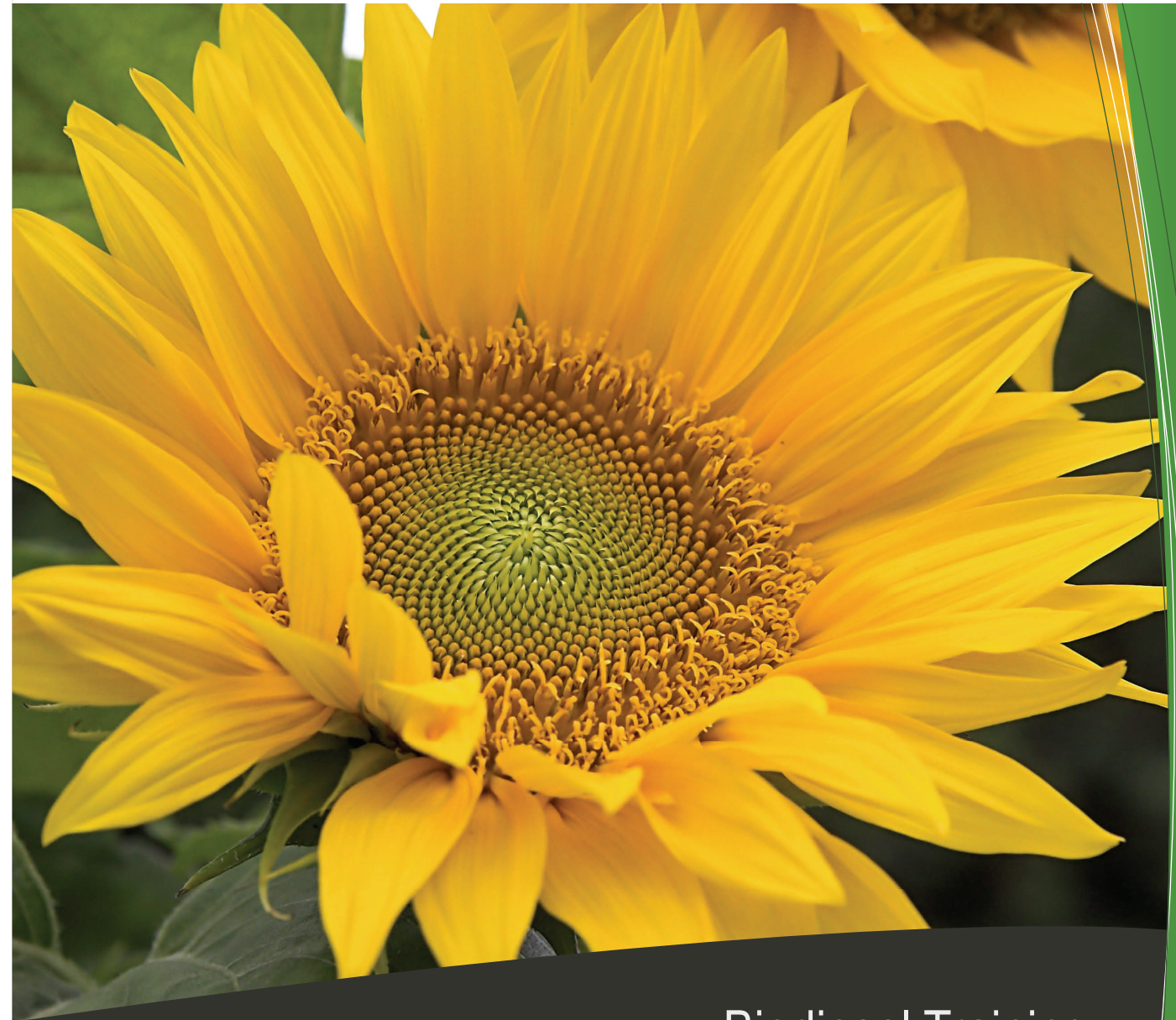
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GenTech Scientific, Inc. is a diversified analytical equipment company dedicated to providing quality new and refurbished instruments and impeccable service to the scientific community around the world. Founded in 1995, GenTech Scientific, Inc. has become a market leader in the sale of recycled analytical equipment, specializing in GC, HPLC, and Mass Spectrometer systems and accessories from all major manufacturers.

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Biodiesel Training

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SHIMADZU GC-2010 Analysis of Biodiesel for Free and Total Glycerines by ASTM D-6584

Rising prices of petroleum fuels are creating a market for alternative sources. Biodiesel is a diesel-like fuel derived from vegetable oil or other renewable resources. It can be made from soy or canola oil, waste cooking oil, and even animal fats.

Today, most of the BioDiesel being produced domestically comes from soy or canola crops. Diesel fuel made from plants has the potential to contain glycerols in the form of free glycerin, mono, di and triglycerides. These compounds have been found to be detrimental to diesel engines so they must be removed prior to use.

Application Summary

In 2002, ASTM International issued a standard specification for BioDiesel fuel called D6751. This specification states that the only form of BioDiesel that can be legally resold for commercial operations must meet ASTM specifications.

ASTM Test Method D6584 is the Gas Chromatography analysis of Biodiesel for Free and Total Glycerines. It requires that a two-internal standard, five-point calibration curve be generated for free Glycerine, Monoglycerides, Diglycerides and Triglycerides achieving a linearity of 0.99 r2. The analytical standards must be derivatized from the free acid form to a methyl ester form so that they will move through a gas chromatographic column prior to analysis.



Shimadzu GC-2010

Instrumentation

Shimadzu GC-2010

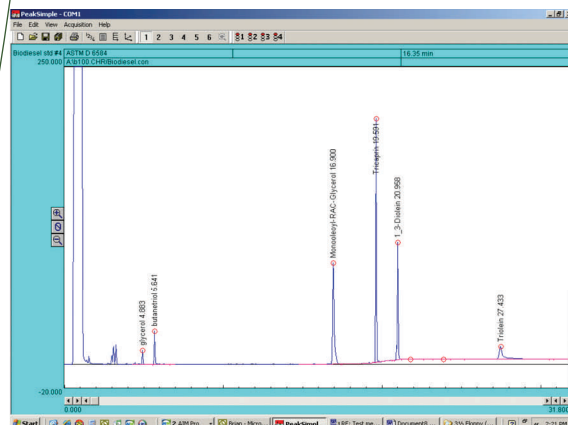
- Injector: Temperature-programmable on-column
- Detector: Flame Ionization Detector (FID) Capillary Column
- Restek Rtx[®]-5, 10m, 0.32mm (id), 0.10µm
- Guard Column -5m x 0.53mm (id) Data Handling Software
- PeakSimple Chromatography[®] Software

Analytical Conditions

- Inlet:** On-column, 1µL (Note: Immediately after injection, the inlet is programmed to follow the temperature program of the oven.)
- Detector:** FID, 380°C
- Oven:** 50°C (1 min)
@ 15°C/min to 180°C
@ 7°C/min to 230°C
@ 30°C/min to 380°C (10 min)
- Carrier Gas:** Helium, 3 mL/min

Biodiesel Standard Chromatogram:

1 µl of the Supelco ASTM D6584 mono, di and triglycerides standard; Level 4.



GenTech Instrument Package: GTS 2010

- GenTech Certified™ Shimadzu GC-2010
- Temperature-programmable on-column injector
- Flame Ionization Detector
- Biodiesel Capillary Column
- PeakSimple Chromatography[®] Software
- PC Data System Included

3 Day Course - On-Site - In-house

- **ASTM D6584** - Learn how to apply the ASTM D6584 method in the process of producing, developing, and testing Biodiesel Fuel.
- **Data System** - During the course you will learn how to create chromatograms & analyze data using a Data System.
- **Reports** - When you complete the course, you will be able to effectively create reports and analyze the results you generated.

*We can also come and train onsite at your facility. Call for details.

Course Features:

- Hands on training
- Step by Step Procedures
- Easy to follow Course Guide
- 3 Day Course
- No Prerequisites
- No Prior Experience Needed
- Shuttle & Accommodations Included



Basic Gas Chromatography Theory

DAY 1

- A. Inlet Types
1. On-Column
2. Split/Splitless
- B. Detector Types
1. Flame Ionization
- C. GC Columns and Separation Theory

Instrumentation Used in Biodiesel Analysis

DAY 2

- A. HP 5890
B. Agilent 6890
C. Shimadzu 2010

Review of ASTM D6584 method for BioDiesel analysis and instrument configuration of Shimadzu 2010 to meet ASTM D6584 requirements.

Routine GC Maintenance & Problem Troubleshooting

DAY 3

- A. Standard Preparation
B. Sample Preparation
C. Instrument conditions required for Analysis
D. Data analysis and Calculations using data system of choice, with hands-on training in use of software.