

**Western Regional Laboratory**  
**Fire Debris Analysis Procedure Manual**  
**Effective date: October 1, 1996**

**Name of Procedure:**

Use of the Hewlett Packard 5890 Gas Chromatograph with HP 5970 Mass Selective Detector

**Suggested Uses:**

Accelerant Identification, Identification of Organic Liquids

**Apparatus:**

Hewlett-Packard 5890 Series II gas chromatograph (GC)  
Hewlett-Packard 5970B Mass Selective Detector (MSD)  
Hewlett-Packard 7673 Automatic Sampler and Controller  
PC type data system with HP G1034C software installed  
Printer and printer paper for plotting spectra and library search  
Ultra-high purity solvent (carbon disulfide or petroleum ether)  
Sample vial (clean/new) with screw top or septum seal (silanized or unsilanized)  
10 mL syringe  
DB-5 column, 30 meter, 0.25 μm film thickness, 0.25mm ID  
Septa 11-mm low bleed  
UHP Helium Carrier Gas  
Hewlett-Packard 5890 Series II Operating Manual, Manual Part No. 05890-90260  
Hewlett-Packard HP 5970B MSD Hardware Manual, Publication Number 05970-90049  
Hewlett-Packard HP 7673 Auto Sampler Operating Manual, Part No. 07673-90185  
Hewlett-Packard HP G1034C MS ChemStation User's Guide (DOS Series)  
Perfluorotributylamine [FC-43]

**Operating Procedures:**

- A. Start-up and calibration
  1. The GC-MS is kept on at all times.
  2. Calibration is done daily with the Autotune program. This procedure uses Perfluorotributylamine as a tuning standard and the resulting data file is kept.
  3. The Autotune file is compared to previous ones and any major variations may indicate instrument problems that should be addressed

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B. Collection and storage of data

1. Double click on **HP ChemStation** Icon
2. Click on **Utilities** and **Start**
3. Select GC-instrument and click **OK** to reach GC-Instrument Top
4. Click on **Methods** and then click **Load**
5. Load appropriate method for analysis
6. Perform Autotune before acquiring any data
7. Click on **Acquire Data** to reach Arson-MSD Acquisition
8. Click on **Acquire Data** again and input all file and sample information
9. Click **OK** - Follow instructions under Manual Injection
10. Analysis and Data collection will begin

C. Data Analysis

1. Click on **Data Analysis** at GC-Instrument Top
2. Click on **Main Panel**
3. Click on **File** and **Load** and select data file that is desired
4. Click on **Chromatogram** and click **Select Integrator** - select appropriate integrator, Chemstation Integrator or RTE Integrator
5. Click on **Chromatogram** and then **Integrate** (parameters may need to be adjusted for optimal integration - refer to Manufacturers Manual)
6. Click on **Spectrum**
7. Click on **Select Library** and choose the appropriate one for analysis
8. Click on **Spectrum** and then **Library Search Report** to create a report where peaks are matched to known Mass Spectra
9. Library Search Report and Total Ion Chromatogram should be printed and kept for files

D. Shut-down

1. Allow the oven to cool to approximately 80°C
2. **DO NOT TURN THE GC-MS OFF.**

**Safety Concerns:**

A. The injector and column areas are hot and can cause burns.

Other Information

Consult the Hewlett Packard manuals.

**References:**

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Various ASTM procedures, including E-1618-94.

ATF National Laboratory Center Class, "Laboratory Detection and Identification of Accelerants Found in Arson Debris."

Saferstein, Richard, Forensic Science Handbook, Chapter 3, "Forensic Applications of Mass Spectrometry," p. 131.