

**FORENSIC TOXICOLOGY LABORATORY  
OFFICE OF THE CHIEF MEDICAL EXAMINER  
CITY OF NEW YORK**

**TROUBLESHOOTING OF AGILENT GAS CHROMATOGRAPHS**

There are many potential scenarios which can ultimately lead to multiple chromatographic problems. A major objective in the GC section is to identify possible situations before they lead to problems with chromatography. There are numerous circumstances which may eventually, directly or indirectly, affect chromatography. This section of the SOP seeks to identify and rectify common problems associated with poor chromatographic results. For some of the “Suggested Action” procedures seen below involving instrument maintenance refer to the GC ROUTINE MAINTENANCE AGILENT 6890 section of the SOP.

<b>Symptoms</b>	<b>Probable Causes</b>	<b>Suggested Action</b>
<b>All peaks reduced in size</b>	“Blown septum” or other massive leaks	Find and fix leaks and adjust gas flow, i.e., change septum or tighten column
	The rubidium salt active element of an NPD detector may be damaged.	Replace bead.
	Inadequate signal amplification.	Check output signal levels, i.e., adjust electrometer by raising bead current.
<b>Flattened top peaks - “peak overload”</b>	Overload of the signal processing electronics.	Lower the bead current which changes its output, as bead may be too sensitive.
	High concentration of drug present in sample.	Repeat sample with appropriate dilutions.
<b>Tailing peaks or missing peaks</b>	Contaminated or active injector liner or column.	Replace injector liner.
	Possible debris in liner or column.	Clean liner. Clip, reinstall and recondition column.
	Contaminated column	Clip the column then recondition column. If problem persists, replace column.
<b>Poor peak resolution or unresolved</b>	Contaminated column.	Clip the column then recondition column. If problem persists, replace column.

Symptoms	Probable Causes	Suggested Action
peaks		
Poor peak resolution or unresolved peaks	Wrong column used.	Reinject samples on correct column (i.e. HP-17 or HP-5)
Bead does not ignite	Gases turned off or not completely turned on.	Check to make sure all gas flows are completely turned on.
(continued) Bead does not ignite	NPD housing not properly seated.	Remove housing and reset to ascertain that housing is set flush on base.
	The bead assembly cable was not correctly connected to the electrometer.	Remove the bead assembly cable and adjust until it is correctly connected to the electrometer.
Significant Retention Time shifts	Change in routine flows and/or temperature.	Check all pressure and temperature parameters of the current method to ensure that they are correct ( <i>the wrong parameters for may have been saved in error</i> ).
Contaminated samples	Methanol wash vials contaminated.	Thoroughly rinse vials and replace methanol.
	Contaminated injector syringe.	Replace syringe.
	Contaminated column from possible sample overload.	Increase oven temperature to 280°C and if possible, allow column to bake overnight.

After performing maintenance to resolve any issue affecting GC chromatography test runs are run, which consists of injecting methanol washes and extracted Cal Group 1 and 2 samples. *Test runs ensure that the GC system is once again operable.*

## REFERENCES

Agilent 6890 GC System Installation Guide.

Agilent 6890 GC System Users Information.

Agilent 6890 GC System Standard Operating Procedures.

Uncontrolled Copy