Checking the Basics

A surprising number of problems involve fairly simple and often overlooked components of the GC system or analysis. Many of these items are transparent in the daily operation of the GC and are often taken for granted (“set it and forget it”). The areas and items to check include:

- Gases: pressures, carrier gas average linear velocity, and flow rates (detector, split vent, septum purge)
- Temperatures: column, injector, detector, and transfer lines
- System parameters: purge activation times, detector attenuation and range, mass ranges, etc.
- Gas lines and traps: cleanliness, leaks, and expiration
- Injector consumables: septa, liners, O-rings, and ferrules
- Sample integrity: concentration, degradation, solvent, and storage
- Syringes: handling technique, leaks, needle sharpness, and cleanliness
- Data system: settings and connections

Condensation Test

Use this test whenever injector or carrier gas contamination problems are suspected (e.g., ghost peaks or erratic baseline).

1. Leave the GC between 40 to 50°C for 8 or more hours.
2. Run a blank analysis (i.e., start the GC, but with no injection) using the normal temperature conditions and instrument settings.
3. Collect the chromatogram for this blank run.
4. Immediately repeat the blank run when the first one is completed. Do not allow more than 5 minutes to elapse before starting the second blank run.
5. Collect the chromatogram for the second blank run and compare it to the first chromatogram.
6. If the first chromatogram contains a larger amount of peaks and baseline instability, the incoming carrier gas line or the carrier gas is contaminated.
7. If both chromatograms contain few peaks or little baseline drift, the carrier gas and incoming carrier gas lines are relatively clean.

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