Technical Note

Contaminants in GCMS

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Contaminants in GCMS

Contamination is often detected by observing unusually high background signals in the mass spectra. This contamination can originate from either the GC or the MS. Analyzing the specific contaminants makes it possible to trace the source of the contaminants. Certain types of contaminants are more commonly associated with the GC, whilst others are typically linked to the MS.

Sources of contamination in GC:

- Dirty liner
- Septum bleed
- Contaminated syringe
- Poor quality carrier gas
- Column bleed
- Contamination due to incorrect handling of cleaned parts

Sources of contamination in MS:

- Air/water leaks
- Contamination due to incorrect handling of cleaned parts
- Dirty source
- Solvents from cleaning the parts

Figure 1 SCION Instruments 8300 & 8500-GC with the 8700 SQ-MS and 8400PRO Autosampler.

Common Contamination Ions

Table 1 Common contaminants in GCMS with associated ions

Ions (m/z)	Compound	Possible source
14	N	Air/water leaks
16	O	
18	H_2O	
28	N_2	
32	O_2	
44	CO_2	
31	Methanol	Cleaning Solvents
43, 58	Acetone	
78	Benzene	
91, 92	Toluene or Xylene	
105, 106	Xylene	
151, 153	Trichloroethane	
31, 51, 69, 100, 119, 131, 169, 181, 214, 219, 264, 376, 414, 426, 464, 502, 576, 614	PTFTBA related ions	Tuning compound ions
73, 147, 207, 221, 281, 295, 355, 429	Dimethylpolysiloxane	Septum/column bleed
149	Plastics, phthalates	O-rings damaged due to high temperatures, vinyl gloves

How can the contamination be resolved?

Air/water leaks → Tighten the nuts on the transferline side, tighten the nuts on the injector side, replace Vespel ferrules, bakeout MS and GC.

Cleaning solvents → Bake out the system and if issue persists then clean the source.

Tuning compound ions → Clean the source, replace the tune solution.

Septum bleed → Replace the septum.

Column bleed → Cut the column and reinstall, if issues persist then condition the column. If still ongoing problem then consider replacing the column.

Damaged O-rings → Replace the O-ring.