

From the Editor: GC Use in Europe



In January 2003, *LC•GC North America* conducted a survey of its readers in an attempt to discover how gas chromatography (GC) was being used, by who and for what purposes. The results were published in the October 2003 issue of *LC•GC North America*¹ and you can view them via www.lcgcmag.com. Having read the results article by Ron Majors, I thought it might be an interesting exercise to run the same survey in Europe — so I did, and, in this short article, you'll read some of what I found out. Although the North American and European surveys are useful to contrast, because of significant differences in the number of respondents, they cannot be directly compared (n = 234 for North America, n = 123 for Europe). Also, the surveys were conducted in different ways: the North American survey was mailed to readers of *LC•GC North America* while the European survey was hosted on www.lcgceurope.com and *LC•GC Europe* readers were asked to participate by e-mail invitation.

LC•GC Europe has a circulation of 26 000 separation scientists of which approximately 60% regularly use GC. So, who are they — well, according to this survey when asked to specify their primary fields of work, environmental, pharmaceutical and agriculture/food are mentioned most often. Unlike in the North American survey, environmental

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remains the number one sector for GC users in Europe, even though a significant portion of the magazine's circulation work within the pharmaceutical industry (~40%). Of the various GC techniques available, by far the most popular is capillary GC with 97% of respondents claiming to use it — compare this with 35% for older packed column GC, the use of which continues to decline as newer capillary GC methods replace existing packed-column GC ones. Headspace GC and purge and trap GC show significant use by the GC practitioners in this survey.

Table 1 shows the most popular application areas for capillary GC use. Solvents/hydrocarbons and environmental samples represent the most significant portion of capillary GC applications, with acids/esters, pharmaceuticals, pesticides and

flavours/fragrances also showing well. In his survey, Majors states that the only application area to show a decline in GC analysis was biomedical and steroids,¹ the proposed reason being that these samples are now more readily analysed by LC techniques. In this survey, GC analysis of biomedical and steroids also appears to be less popular. Important application areas for packed-column GC were solvents/hydrocarbons and gases. Column selection is vital in GC and Table 2 lists a selection of the most popular stationary-phase types. Similar to the North American study, use of methyl and phenyl phases for

Table 1: Applications performed using capillary GC columns.

Application	% Respondents
Solvents/hydrocarbons	52.2
Environmental	44.2
Acids/esters	33.6
Pharmaceuticals	28.3
Pesticides	27.4
Flavours/fragrances	25.7
Gases	16.8
Amines/bases	15.9
Monomers/polymers	15.9
Biomedical/steroids	14.2
Forensics	12.4
HT triglycerides	9.7

Table 2: Stationary phases used in capillary GC columns.

Phase	% Respondents
5% Phenyl methyl silicone	66.4
100% Methyl silicone	61.9
Polyethylene glycol (WAX)	45.1
50% Phenyl methyl silicone	33.6
14% Cyanopropylphenyl methyl silicone	22.1
Proprietary phase volatiles column	16.8
High-temperature/low bleed	10.6
Styrene-divinyl benzene porous polymers (PLOT)	8.8
Cyanopropyl methyl-phenyl methyl silicone	6.2
Molecular sieves (PLOT)	6.2
Trifluoropropyl methyl silicone	5.3
Silica (PLOT)	4.4

Table 3: Most common GC column problems.

Problem	% Respondents
Contamination	37.2
Poor resolution	25.7
Stationary-phase bleed	20.4
High cost	19.5
Lack of column-to-column reproducibility	14.2
Leaks	14.2
Appearance of ghost peaks	13.3
Lack of inertness	10.6
Column breakage	5.3

non-polar analysis is by far the most common, although it is interesting to note that 5% phenyl methyl silicone phases are most popular in Europe whereas 100% methyl silicone phases are the most popular in North America. Polyethylene glycol phases for polar analytes are also extremely popular.

Well, that's covered the who, the how and the why, but what about the important bits — how long do columns last and what problems are encountered when you're using them?

Column lifetime appears to be extremely similar in both Europe and North America, not surprising really considering the similarities in application areas and preponderance of 'global' column manufacturers. In this survey, almost half of respondents claim that their columns last in excess of 12 months. Majors estimated that the average column lifetime was approximately 11 months in North America,¹ and this appears to be very similar in Europe. Of the problems experienced by GC users in this survey, contamination was the most common (Table 3). Poor resolution came in second with both high-cost and stationary-phase bleed close behind. However, unlike in the North American survey, in which leaks was the second most reported problem, in Europe leaks came much further down the list of concerns.

This editorial has briefly covered some of the topics from our 2003 GC Users Survey. If you would like to view the entire report, which also covers such areas as carrier gases, regulators, filters/purification, tubing, detectors and data handling then visit www.lcgceurope.com and click the 2003 GC Users Survey button — it makes for interesting reading.

Reference

1. R.E. Majors, *LC•GC North America*, 21(10), 960–966 (2003).