The Determination of Allergens in Fragrance Products

Fast GCMS with narrow bore Columns

Dr. Hans-Ulrich Baier
Shimadzu Deutschland GmbH Duisburg,
hub@shimadzu.de

The determination of 24 Allergens in cosmetic products has become an important issue due to the procedure described by the IFRA (International Fragrance Association) [1]. Where fragrance products like perfumes can be diluted and measured with GCMS directly products like creams and lip sticks need preparation. The latter can be done either by the difficult matrix introduction technique [2] or by SPME/GCMS [2].

The analysis time needed to separate 24 allergens is rather large. This can be seen from fig 1, where a TIC from a standard is shown by using a 50 m, 0.25 µm, 0.25 mm column.

Fast GCMS by using narrow bore columns has become a reliable routine tool by maintaining most of the chromatographic resolution. Here very often a factor of about 10 can be achieved in reduction of analysis time. The GC and MS hardware however need to fulfill some requirements for effectively using the resolving power and to get accurate and reliable data. Regarding the GC the parameters are described elsewhere [3]. For the MS part both the scanning rate (amu/s) as well as the number of scan (or SIM) data points are important. This is the case as in full scan the spectrum quality need to be high in order to get good library search results. The number of data points acquired across a peak need to be high enough to have reproducible data. In figure 2 the TIC data of the standard is shown by using a SPB5 10 m, 0.1 mm, 0.1 µm column.

The analysis time is less than 7 min without loss of resolution. The peak width at half maximum for linalool for instance is about 0.6 s and the MS was set to acquire 27 data points across the peak. The resulting scan speed was then 10000 amu/s. To show that there is no skewing of the spectrum in the peak rise, top or descent figure 3 shows the spectra of 3 points for linalool after background subtraction.

To have quantitative results calibration curves were measured with 41, 91, 145, 202 Da. The reproducibility was less than 1.5 %RSD.

Conclusion

Fast and high resolution GCMS analysis can be done very reproducible with the GCMS-QP2010. The %RSD values for replicates for Scan and SIM data were better than 2%. The above method therefore is suitable for routine analysis of allergens in fragrance products