

High-concentration capacity headspace extraction coupled with comprehensive multidimensional gas chromatography for enhanced chromatographic fingerprint of food

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The coupling of high-concentration capacity headspace extraction (HCC-HS) with gas chromatography (GC) and in particular with comprehensive multidimensional GC (GC×GC), has played a fundamental role to enhance significantly the level of information that can be extrapolated from a chromatographic fingerprint. The first HCC-HS paper was published in 1993 by Zhang and Pawliszyn [1], where the use of solid-phase microextraction (SPME) was extended from the extraction of organic pollutants in water [2] to the HS. The first coupling of SPME and GC×GC for food analysis occurred in 2002, when Adahchour *et al.* [3], showed the potentiality of such a marriage for the characterization of garlic volatiles. Since then, a constantly increased number of papers have been published using SPME-GC×GC for an in-depth characterization of food volatiles. Nevertheless, in more recent years, different HCC-HS tools (e.g., HiSorb) have been developed, along with a more -omics approach to fully explore the multilevel information that can be obtained using such a powerful coupling (HCC-HS-GC×GC).

The aim of this presentation is to elucidate the potentiality of such a coupling and its further development to answer to more sophisticated food-related questions using a more integrated and interactive approach in data handling. In particular, the optimization of HiSorb-GC×GC in comparison to SPME and the investigation of the generated chromatographic fingerprints to correlate the sensory perception of brewed coffee with the specific packaging will be discussed.

References

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