

DYNAMIC HEADSPACE SAMPLING IN THE ANALYSIS OF SOLID MATRICES OF VEGETABLE ORIGIN

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Dynamic headspace sampling (D-HS) also known as *purge and-trap* was first introduced by Wahlroos in 1963 [1]. D-HS is a non-equilibrium *continuous gas extraction* technique providing high and flexible concentration factors, [2] that mainly consists of three steps: i) a continuous removal of the volatiles released from a matrix by an inert gas flowing through or over it; ii) their concentration from the above flow stream on a solid adsorbent, a sorbent, or through cryo-trapping, and iii) their recovery from the trap by thermal desorption or solvent elution, either on-line or off-line to a GC or GC-MS system for analysis.

The recent technological improvements and possibility of automation of this technique have resulted in a renew of interest for this sampling approach. The introduction of both in-parallel multi-sampling and new trapping materials together with the possibility to design an effective sampling process by applying correctly the theory of breakthrough volume resulted in a better selectivity, flexibility and possibility of fractionated enrichment in particular for very high volatility compounds, and has drastically improved the performance of this technique extending its fields of applications.

This lecture will discuss the possibility offered by modern automatic systems of dynamic headspace in fractionated sampling of the volatile fraction of solid matrices of vegetable origin also through some examples from real-world samplings taken from the authors' everyday experience

References

[1] Wahlroos O., Ann. Acad. Sci. Fenn. Ser A. II, *Chemica* (1963) 122

[2] Kolb B. et al., *Static Headspace-Gas Chromatography, Theory and Practice* (1997)