

P78 - Non-targeted screening for volatile compounds in food contact bioplastics using Purge and Trap coupled to Gas chromatography-Mass Spectrometry

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Bio-based and/or biodegradable plastics are being developed as sustainable packaging solutions. The use of environmentally friendly bioplastics is expanding, and it is expected to grow significantly in the next few years. Similarly to petrochemically based polymers bioplastics are subject to the regulatory requirements of food contact materials in terms of inertness and safety of the material. Both intentionally (IAS) and non-intentionally added substances (NIAS) should be evaluated to protect the consumers' health. Non-targeted methods are commonly used for the analysis of NIAS. Sample preparation is the first step in the analysis of potential migrants and usually it is a laborious and time-consuming procedure. The Purge & Trap system coupled to Gas chromatography-Mass Spectrometry (P&T-GC-MS) has demonstrated to be an efficient analytical tool for the extraction and subsequent analysis of volatile compounds.

In this work, a P&T-GC-MS method was optimized for the analysis of volatile compounds in food packaging samples labeled as bio-based and/or biodegradable and based on polypropylene (PP), polyester and Polylactide (PLA). Samples were subjected to 80 °C for 30 min and the separation of the analytes was made using a Rxi-624Sil MS (30 m × 0.25 mm internal diameter, 1.40 µm film thickness) column. The NIST/EPA/NIH 11 (version 2.0) and Wiley RegistryTM 8th edition mass spectral libraries were used for identification purposes. Only 16 of the 120 compounds detected in the samples are listed in the Regulation 10/2011. Monomers such as propylene glycol and 2-ethyl-1-hexanol, were identified in polyester samples. 2,3-pentanedione was identified in all PLA samples and it has been described as a degradation product [1].

References:

- [1] Salazar et al. (2017) Polymer Degradation and Stability. <https://dx.doi.org/10.1016/j.polymdegradstab.2016.12.010>

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