

P13/ IDENTIFICATION OF MIGRANTS IN EPOXY CAN COATINGS BY LC-MS/MS

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A variety of different materials are used for the coating of cans, but epoxy polymers are the type of coating most widely used. Epoxy resins are obtained by the condensation of epichlorohydrin and bisphenol A (BPA), which yields bisphenol A diglycidyl ether (BADGE). These compounds can potentially migrate from the food contact material into the food and they are regulated with their specific migration limits. However, migrants from epoxy coatings may also contain oligomers, adducts with chain stoppers or reaction products of either solvents or phenolic monomers, among others.

The objective of this work is the identification of these potential migrants in polymeric coatings including intentionally added substances (IAS) such as monomers, additives and non-intentionally added substances (NIAS) such as oligomers by liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) using the full scan mode. It is a difficult task due to the lack of information about the formulations used in the manufacture of the coatings as well as the lack of commercially available standards of these compounds. In this study, several internal coatings of can samples were investigated after an extraction with acetonitrile. Moreover, an identification of the type of coating was performed using an ATR-FTIR spectrometer equipped with a diamond optical crystal. Several non-intentionally added substances, specifically oligomers were identified in the samples analysed including BADGE.H₂O.BPA, cyclo-di-BADGE, BADGE (n=1) H₂O.BPA, BADGE.BPA.BuOH or BADGE (n=1) BPA among others. Only compounds with a molecular weight up to 1000 m/z were included in the study because it is generally recognized that compounds, except perfluoroalkyl compounds, above this mass range are typically not absorbed through the gastrointestinal tract. Further studies, namely migration assays will be required in order to identify these compounds in foodstuffs.

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