

OLIGOMERS OF BISPHENOL A DIGLYCIDYL ETHER IN EPOXY CAN COATINGS

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Abstract

A variety of different materials are used for the coatings of food and beverage cans, but epoxy polymers are the types of coatings most widely used. Besides epoxy monomers, migrants from epoxy coatings may also contain BADGE adducts with chain stoppers or reaction products of either solvents or phenolic monomers, which can be formed during the curing process. These substances could be released and migrate into foods. The objective of this study is the identification of these potential unreacted substances/oligomers that could migrate from epoxy coatings by liquid chromatography coupled to tandem mass spectrometer (LC-MS/MS). For this, the can was extracted with acetonitrile at room temperature for 24 hours. The mass spectrometer was operated in positive and negative atmospheric pressure chemical ionisation (APCI) mode. MS data were acquired in full scan mode up to 1000 m/z. Several chromatographic peaks with different m/z values were detected. These masses were compared with the available literature based on the possible starting substances. BADGE derivatives were identified: BADGE.H₂O.BPA, cyclo-di-BADGE, BADGE(n=1)H₂O.BPA, BADGE.BPA.BuOH or BADGE(n=1)BPA, among others. This research was funded by the Ministerio de Ciencia, Innovación y Universidades, Fondo Europeo de Desarrollo Regional (FEDER), and Agencia Estatal de Investigación Ref. No. PGC2018-094518-B-I00 "MIGRACOATING" (MINECO/FEDER, UE).

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