Development of a Gas Chromatographic/Mass Spectrometric Method for Determination of Phthalates in Oily Foods


Abstract:

A GC/MS method was developed for simultaneous determination of 12 phthalates and four other plasticizers: acetyl tributyl citrate, di(2-ethylhexyl) adipate, dibutyl sebacate, di-isononyl cyclohexane 1,2-dicarboxylate (DINCH) in vegetable oil, pesto, and tomato sauce. Samples were extracted with acetonitrile and cleaned on a Florisil column. The final extract was analyzed by GC in combination with ion trap MS. The phthalates and di-isononyl cyclohexane 1,2-dicarboxylate were detected by MS/MS, while the other three plasticizers were monitored in the same GC run using full scan mode. The analytical process was validated in each matrix by the analysis of blank samples. Performance characteristics, such as linearity, LOQ, precision, and recoveries were studied. Studies at fortification levels of 0.25-200 mg/kg gave mean recoveries ranging from 71 to 106 and RSD values between 7 and 12 for all compounds. LOQs were 0.05-0.10 mg/kg for all the target compounds except di-isononyl phthalate, di-isodecyl phthalate, and DINCH (2.0 mg/kg).