

New Off-Line SPE-GC-MS/MS Method for Determination of MOSH/MOAH in Animal Feed, Foods, Infant Formula and Vegetable Oils

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ABSTRACT: MOH (mineral oil hydrocarbons) which consist of mineral oil saturated hydrocarbons(MOSH) and mineral oil aromatic hydrocarbons(MOAH) are present in various products such as vegetable oils, animal feed, foods and infant formula. Contamination of foods with mineral oil hydrocarbons, particularly mineral oil aromatic hydrocarbons(MOAH), exhibiting carcinogenic, mutagenic and hormone-disruptive effects. Identifying toxic substances among the many thousands comprising mineral oils in food samples is a difficult analytical challenge. A new method based on an offline-solid phase extraction approach coupled with gas chromatography-triple quadrupole(GC-MS/MS) was developed for determination of MOSH/MOAH in various products such as vegetable oils, animal feed, foods and infant formula. A glass SPE cartridge loaded with 7 g of activated silica gel impregnated with 10 % silver nitrate for removal of olefins and lipids. The MOSH/MOAH fractions in the oil samples were eluated with hexane and hexane: dichloromethane :toluene(75:20:5), respectively. Each eluate was concentrated to 50 μ l in toluene and injected on splitless mode into GC-MS/MS. Accuracy of the method was estimated as measurement of recovery of spiked oil samples at 2.0, 15.0 and 30.0 mg kg⁻¹, and recoveries varied from 85 to 105 %. The method was applied to the different types of samples (sunflower meal, chocolate ships, santa milk chocolate, biscuits, infant milk, cornflakes, refined sunflower oil, crude sunflower oil), detecting MOSH up to 56 mg/kg and MOAH up to 5 mg/kg. The limit of quantification(LOQ) of proposed method was estimated at 0.5 mg/kg and 0.3 mg/kg for MOSH and MOAH ,respectively.