

5th International Conference and Exhibition on Analytical & Bioanalytical Techniques

August 18-20, 2014 DoubleTree by Hilton Beijing, China

Simple and fast analyses using GC-FID for detection of a potential genotoxins (isopropyl para-toluenesulfonate) in palm oil based esters a common ingredient used in cosmetic and personal care products

Bonnie Yen Ping Tay

Malaysian Palm Oil Board, Malaysia

This presentation will describe a new method using GC-FID to detect isopropyl p-toluenesulfonate (IPTS) in isopropyl palmitate (IPP) and isopropyl myristate (IPM). These esters are commonly used in cosmetic and personal care (CPC) formulation when good absorption through skin is needed. p-Toluenesulfonic acid (PTSA) is a catalyst commonly used by IPP/IPM producers during esterification of palm oil-based palmitic and palm kernel oil-based myristic acids through reaction with isopropanol (IPA). Under certain conditions, IPTS may be formed due to the tosylation reaction between IPA and PTSA. In this method, spiked IPP/IPM was directly analysed by GC without undergoing any clean up step. Calibration curves showed good linearity (0.5-50 $\mu\text{g mL}^{-1}$, correlation coefficient: 0.9999). Recovery test revealed that the method showed excellent accuracy (IPP: 98.6%-103.5%, RSD: 0.40-2.80 % and IPM: 97.0-107.2%, RSD of 0.42-4.21%). The LOD and LOQ for spiked IPP/IPM were 12.5 $\mu\text{g g}^{-1}$ and 25 $\mu\text{g g}^{-1}$ respectively. The identity of IPTS in the spiked isopropyl esters was confirmed by a GC-MSD. Analyses of IPTS in commercial palm-based ester samples showed good repeatability (RSD <5%) with concentrations ranging from 34.8-1303.0 $\mu\text{g g}^{-1}$. This is the first finding on detection of IPTS in palm-based esters, and the method can be useful as a quality check for IPP/IPM esters producers and CPC manufacturers.

Biography

Bonnie Yen Ping Tay received her Bachelor of Science (pure chemistry) and Master of Science degree (organic chemistry) from University Putra Malaysia. She joined Malaysian Palm Oil Board as a research officer (RO) in 1996, majoring in analyses of palm oil phytonutrients at the Engineering and Processing Division of MPOB. In 2005, she joined another division in MPOB, Advanced Oleochemical Technology division under the Quality and Environment Assessment Unit (QEA). From 2011 till now, she holds the positions of principal research scientist. She is also the Quality Manager (MS/IEC 17025 accreditation) for QEA unit Analytical Laboratory which provides analytical services to the Malaysian palm oil industry. She is also doing research work in the field of oleochemicals method development which includes gel permeation chromatography analyses for palm-based polyols, chemometrics, e.g., measurement of hydroxyl value for palm-based polyols by NIR/FTIR spectroscopy, detection of palm oil residue in palm kernel and palm oil methyl esters by NIR and FTIR; by-products detection in oleochemicals e.g., methyl ester sulfonate and fatty alcohol ethoxylates. She was the main author of several publications in MPOB produced refereed journal, *Journal of Oil Palm Research*, *International Journal of cosmetic science* and a patent on extraction of palm carotenoids from crude palm oil.

bonnie@mpob.gov.my