

Sterol Analysis in Fats and Oils with Coupled Chromatographic Techniques (LCxGC-FID)

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The analysis of sterols in fats and oils is important to get information about the identity of fats and oils. With the information about the individual sterol profile and the total sterol content of fats and oils, authenticity can be checked and adulterations can be detected. Several methods with different scopes were published to analyze sterols in vegetable fats and oils [1].

A significant standard method for the analysis of sterol is the ISO 12228 [2]. For the sample preparation according to this method, the fat is saponified, separated by column chromatography, cleaned-up by a preparative TLC, silylated and analyzed by GC-FID. All these preparation steps are time and material consuming and need much experience of the analyst to get repeatable results. This complex sample preparation is necessary to remove the saponifiable lipids in the first step and to separate 4-methylsterols and 4,4-dimethylsterols from the relevant sterols (which are the 4,4-desmethylsterols).

The aim of this study was to develop a coupled chromatographic technique which replaces the sample preparation in most instances. A system using the LCxGC-FID technique was used to separate the sterols from the other lipid classes in the first step on a silica gel column and to determine the sterol profile and content after the separation on the GC. The method was validated on several different virgin and refined vegetable fats and oils and compared with the results generated by the ISO 12228 method.

References

[1] Abidi, S.L. (2001) Chromatographic analysis of plant sterols in foods and vegetable oils. *J. Chromatography A* 935, 173-201

[2] ISO 12228:1999 Animal and vegetable fats and oils -- Determination of individual and total sterols contents -- Gas chromatographic method