

# Application Data Sheet

## No.27

### GCMS

Gas Chromatograph Mass Spectrometer

## Analysis of Fatty Acids in Butter Using GC x GC-MS

Figure 1 shows the results from GC x GC-MS analysis of methyl esterified lipids extracted from commercial butter by the Folch method.

It confirms the main components, palmitic acid (C16) and oleic acid (C18 1 $\omega$ 6), as big blobs (see Figure 1). C18 fatty acids include a variety of components and isomers, but these can be separated into their respective components for highly accurate qualitative and quantitative results by using a second column with high polarity.

Table 1: Analysis Conditions

GC x GC modulator	: ZX1-GC x GC modulator	[MS]
GC-MS	: GCMS-QP2010 Ultra	Interface temperature: 240°C
[GC x GC]		Ion source temperature: 200°C
Column	: 1st DB-1 (30 mL x 0.25 mmI.D., 0.25 $\mu$ m) 2nd Rtx-WAX (2.5 mL x 0.1 mmI.D., 0.1 $\mu$ m)	Solvent elution time: 15.5 min
Injection quantity	: 1.0 $\mu$ L	Data sampling time: 16 min to 80 min
Injection mode	: Split (split ratio 100)	Measurement mode: Scan
Vaporization chamber temperature	: 250°C	Mass range : $m/z$ 45-330
Column oven temperature	: 40 °C (2 min) -> (30 °C /min) -> 160 °C -> (2 °C /min) -> 300 °C (5 min)	Event time : 0.02 sec
Control mode	: Constant pressure (150 kPa)	
Modulation time	: 8 sec	
Hot pulse time	: 0.5 sec (325 °C)	

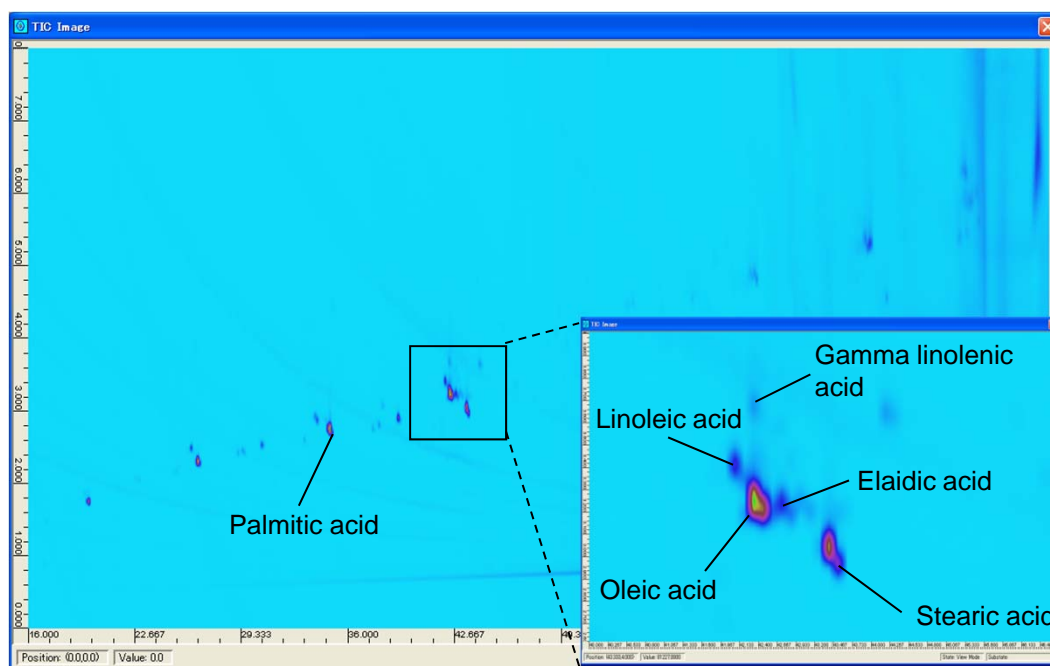


Fig. 1: 2-Dimensional Image of GC x GC-MS Analysis Results for Butter