The analysis application of soy sauce by ionRocket-DART®-MS

【Keyword】 Soy sauce, ionRocket, DART®

【Subject area】 Food, Quality control (QC), Research and Development

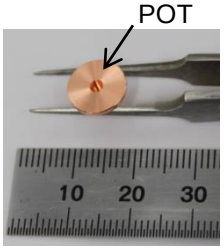
■ Introduction

Soy sauce is a major ingredient and condiment in Japan, with many regional varieties and varieties for specific uses. Sashimi soy sauce, often used as a condiment for sashimi, is brewed twice and requires twice the ingredients and twice the production time compared to standard soy sauce.

The ionRocket is a thermal desorption device for DART®-MS (Direct Analysis in Real Time- Mass Spectrometry) which allows samples to be heated on a gradient from ambient to 600 ºC prior to ionization. In this application we used ionRocket to analyze and differentiate soy sauce types.

■ Sample

Two types of soy sauce: Standard grade and Sashimi (Commercial items)



■ Method

ionRocket was mounted on a DART®-MS. A 2 µL sample was placed into a sample pot, which was then loaded into the ionRocket. The temperature was raised by the ionRocket at 100 ºC/min from room temperature to 600 ºC. The total run time was about 7 min.

■ Result

The analysis results of standard and Sashimi soy sauce are shown in Figure 1 and 2. The tendencies in the heat map are different.

At RT 3.1 min the same species were observed in both samples, though the intensities were different. In the standard grade soy sauce, the intensities of *m/z* 116 and 118 were the same level, however in Sashimi soy sauce the *m/z* 116 intensity is much lower than that of 118.

At RT 6.0 min, many more ions were observed in Sashimi soy sauce than in standard grade soy sauce.

These differences are a result of the different brewing method.

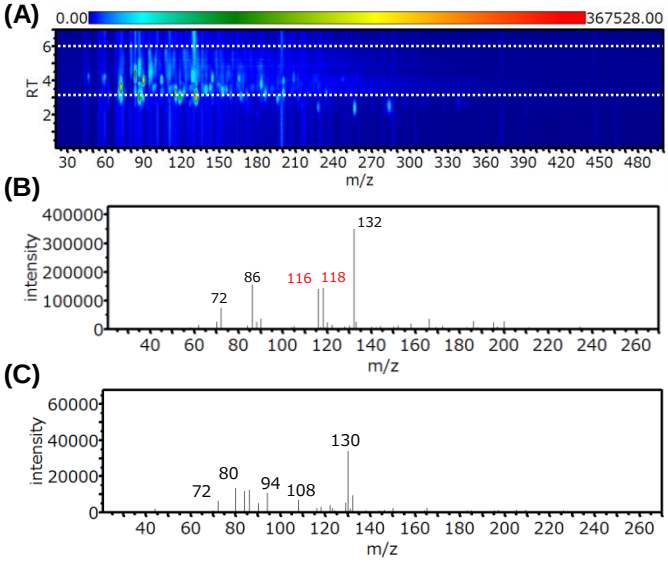


Figure 1. Standard soy sauce

(A) Heat map (B) The mass spectrum at RT 3.1 min
(C) The mass spectrum at 6.0 min

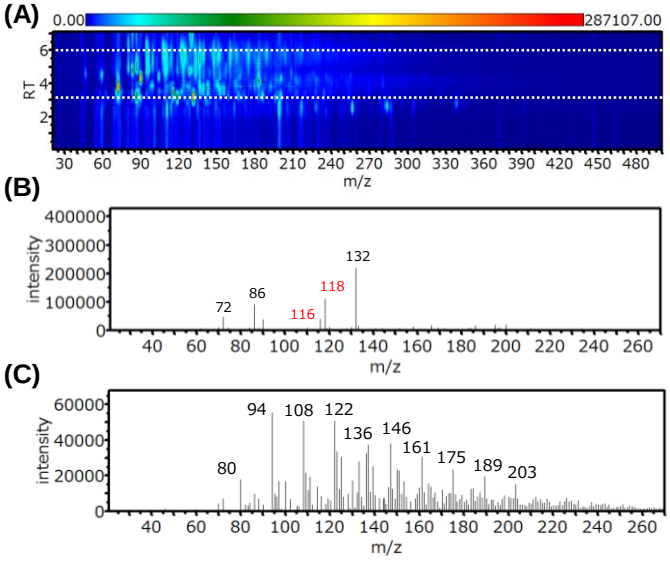


Figure 2. Sashimi soy sauce

(A) Heat map (B) The mass spectrum at RT 3.1 min
(C) The mass spectrum at 6.0 min

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