Analysis of Oils in Deep-fried Foods by ionRocket-DART®-MS

EI-018

Background

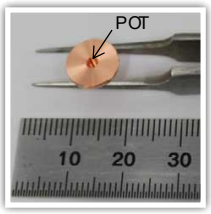
Sunlight and heat can accelerate oxidation and decomposition of fats and oils in foods, thus harming the flavor and causing harmful substances. To determine food quality it is important to evaluate the degree of deterioration. Generally the deterioration of fats and oils is measured as the acid value and peroxide value, which can take considerable time and effort when measuring many samples. Alternatively, ionRocket DART®-MS analysis can detect glycerols and their degradation compounds in foods without titration or pretreatment.

Samples

Pop corn (commercial products): 1) No treatment; 2) 80°C x 24 hrs thermal treatment

Methods

The popcorn kernels were cut into 1 mm particles and then placed in the ionRocket copper sample pot. A temperature gradient of 100 °C /min. from room temperature to 600 °C was applied. Total run time was 7 min.



Results

TIC and MS spectra measured at 300°C to 400°C and 400°C to 500°C are shown in Figure 1 and Figure 2. In the MS spectra taken at 300°C to 400°C, glycerols were observed in both samples and again in the MS spectra taken at 400°C to 500°C in the untreated samples. In contrast thermal degradation compounds were observed instead of glycerols in the heat treated samples at 400°C to 500°C. ionRocket DART®-MS can analyze the degree of degradation of oils in foods directly. So, this analysis method is useful for stability evaluation and quality control of mixed materials such as foods.

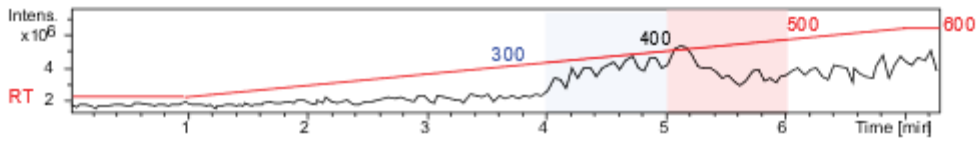


Figure 1. TIC of non treated pop corn

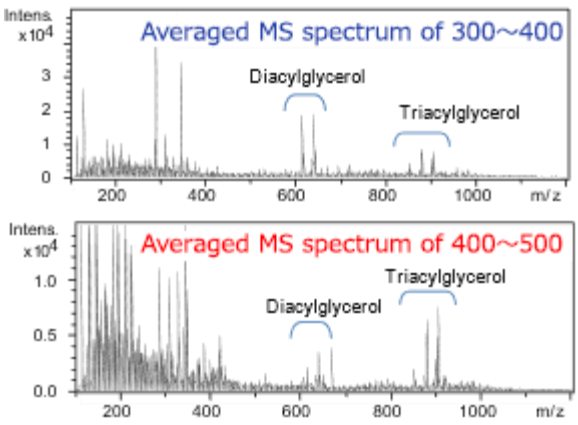


Figure 2. MS spectra of non treated pop corn

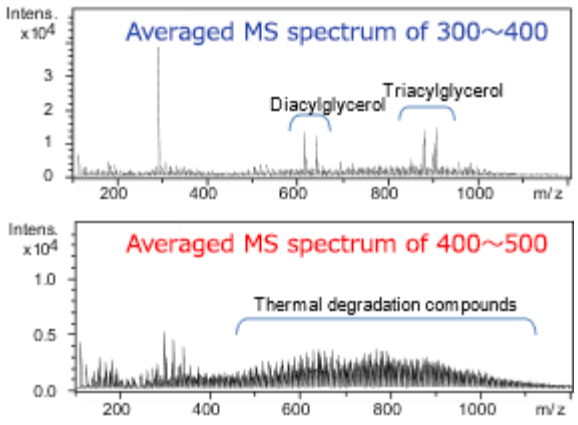


Figure 3. MS spectra of thermal treated pop corn

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