

[Keyword] Bath additives, Perfume, Aroma Therapy, Volatimeship, DART®

Introduction

What is the essence of a pleasant fragrance? GC/MS has been conventionally used for analyzing the volatile compounds associated with fragrance, and is an excellent analytical technique, but is not suitable for rapid screening or monitoring time-dependent change (scent release) in seconds.

However, a DART®-MS Volatimeship system using the DART® ion source, which is one of atmospheric pressure ionization methods, is enable to perform real-time measurement of scent release. In this report, we introduce the application of real-time monitoring of scent release when the bath additive is added into the bath by reproducing the bath-like atmosphere aside the mass spectrometer.

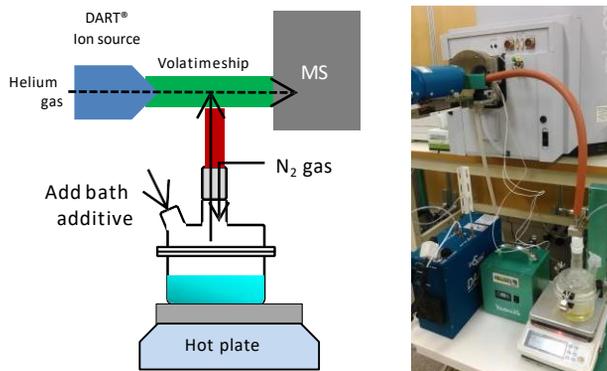


Figure 1. Configuration and device pictures
(A) Configuration (B) Devices

Samples

Bath additives with citron scent (2 types)



Methods

The analysis system was composed of a DART® ion source connected to a mass spectrometer with the Volatimeship connected in between. (Figure 1) A separable flask was connected to the Volatimeship, and hot water at 40°C was placed in the flask. The flask was then placed on a hot plate to stay warm. After measuring the background, a bath additive was added and the volatile compounds of bath additives were detected.

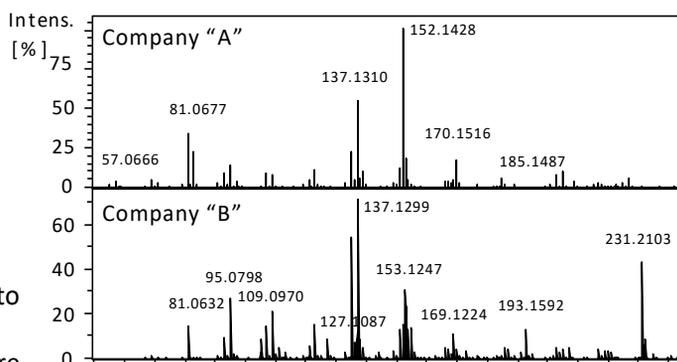


Figure 2. Mass spectrum 30 seconds after introducing bath additives

Results

Figure 2 shown the mass spectrum of 30 seconds after each bath additive was added. Although each sample had the same type of fragrance, differences in the peaks and composition ratio (intensity ratio) of the volatile compounds were clearly shown. Thus, this method was expected to be a useful tool as a rapid screening method. (Time: within 1 minute).

Furthermore, the time-dependent release behavior of characteristic compounds of each bath additive was shown in Figure 3. (Duration one minute after adding bath additives). By detecting the time-dependent profile of compound's volatilization behavior, this method enhances evaluation of samples in conjunction with other evaluation methods, such as a sensory evaluation.

This is useful for product differentiation and characterization during product development and promotions.

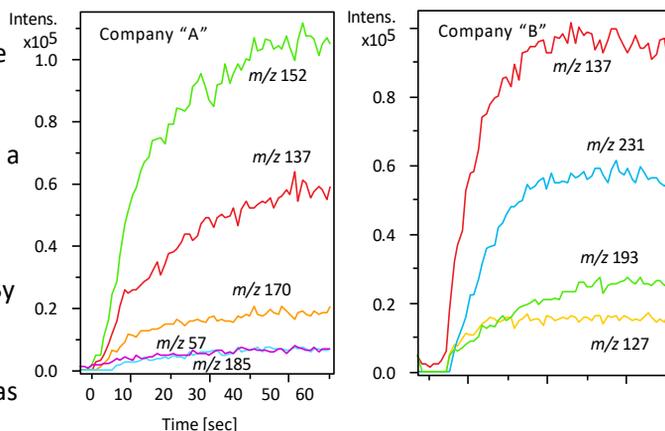


Figure3. Release behavior of each compounds