

Direct analysis of stains on cloth caused by cosmetic

Product used : Mass Spectrometer (MS)

Foundation is one of the essential cosmetics for women. At the mean time, it often makes a stain on clothing. We directly analyzed foundation stains on cloth (Fig. 1) without sample preparation by using DART (Direct Analysis in Real Time) ion source installed on AccuTOF™ LC series. Foundation from 3 manufacturers were measured and compared.

Helium was used as the DART gas. The DART gas heater was set to 200 °C. A small piece of cloth on which foundation was deposited was presented to the DART ion source.

Ions at m/z 371 were observed from the foundation of all 3 manufacturers. Based on the measured accurate masses, the elemental formula of the ions was elucidated to be $C_{10}H_{31}O_5Si_5$ and inferred to be the $[M+H]^+$ ions of decamethylcyclopentasiloxane. Ions at m/z 223 were found only from Bland A and their elemental composition was elucidated to be $C_{10}H_{15}O_2Si_2$ from the measured accurate m/z .

By using DART ion source, the nature and cause of stains on cloth can be determined without sample preparation.

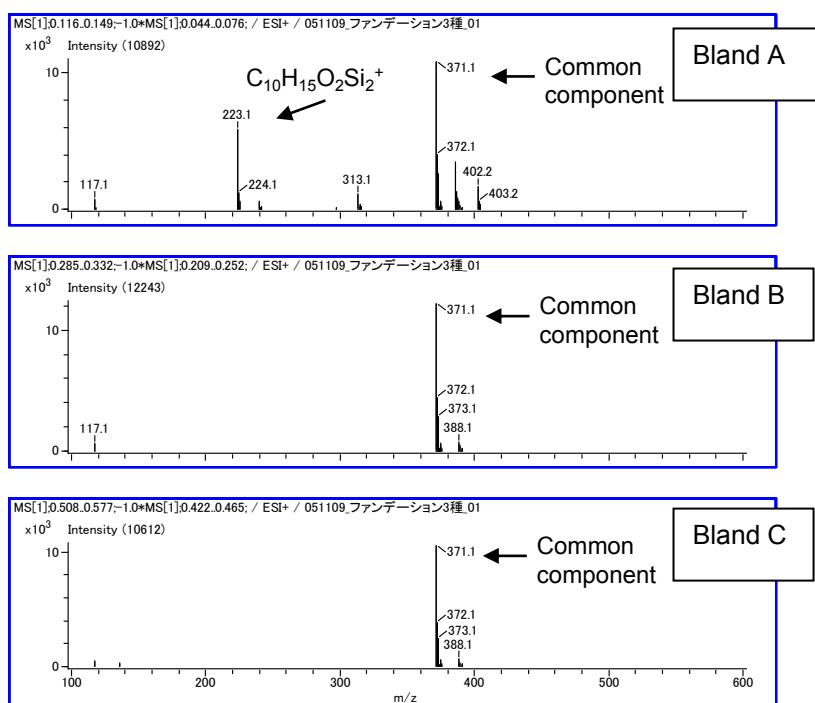


Fig. 1 A foundation stain on a piece of cloth.

Fig. 2 Mass spectra of foundation stains (Top: Bland A, Middle: Bland B, Bottom: Bland C)

Measured m/z	Calculated m/z	Error ($\times 10^{-3}$)	Elemental composition	Unsaturation
223.06194	223.06106	0.88	$C_{10}H_{15}O_2Si_2$	5.5
371.10100	371.10178	-0.78	$C_{10}H_{31}O_5Si_5$	0.5

Table 1 Elucidated elemental compositions of the ions found in the mass spectrum of Bland A.

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