

Melting Behavior Evaluation of Cosmetics by Real View DSC

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- Real View DSC is a thermal analysis system that simultaneously performs differential scanning calorimetry (DSC) while observing the sample via a mounted CCD camera.

- Real View DSC (RV-DSC) records changes in sample shape and color that accompany phase transitions (melting/crystallization, glass transition, etc.) and reactions (curing, polymerization, cross-linking, etc.), providing new information unobtainable from DSC alone.

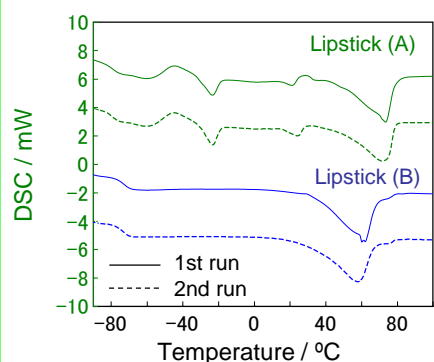
- Previously, phase transitions/reactions were difficult to evaluate solely from DSC data, but direct observation of the samples provides additional details information that enable a more detailed analysis.

- This report introduces a RV-DSC observation of the melting behavior of lipstick.



DSC7000X + RV-1DX
Real View DSC System

Results



◇ DSC data for lipstick (A) and (B)

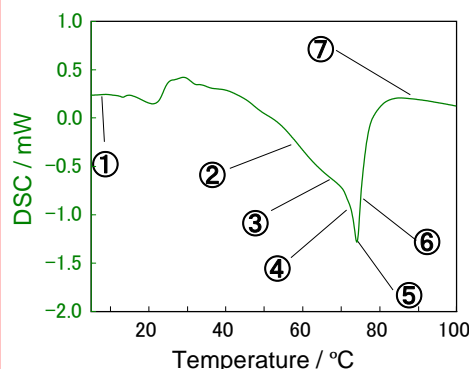
◇ Comparison of components

Lipstick (A) has primary melting peaks around -20 and 70 °C, and multiple components are suggested.

Lipstick (B) has a single melting peak around 60 °C, indicating that it has fewer components than Lipstick (A).

◇ Thermal history (crystallinity comparison)

In the 1st run, the melting peak for the fat component is a doublet with a complex shape. This reflects the thermal history of the manufacturing process. Because the thermal history in the 1st run is relaxed in the 2nd run, the resulting peak shape is a singlet.



◇ Change in the sample shape at melting

From the melting peak alone, the following two questions cannot be answered:

- When does the sample begin to melt?
- When is melting complete?

However, RV-DSC data can be used to answer these questions.

Before the maximum of the melting peak (④), the outline of the sample starts to blur and melting begins. At the peak maximum (⑤), the outline is completely blurred, but the sample has not yet reached the molten state. After the peak maximum (⑥), the sample has spread throughout the tin. Beyond the melting peak (⑦) the sample is in a completely molten state.

