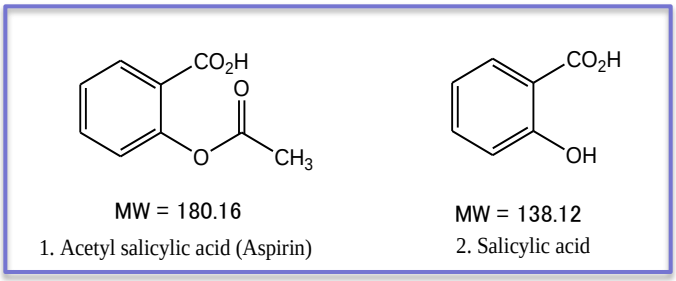
-Analysis of decomposition products in aspirin by application of two-wavelength detection-

The Chromaster 5410 (UV Detector) permits two-wavelength simultaneous measurements by realtime wavelength-switching. Beyond the measurement of impurities, the system provides a powerful tool for the analysis of proteins and peptides. By setting a data capture interval of 400 ms or greater for wavelength-switching, users can accurately detect peaks without missing any data points. The following data describes the simultaneous analysis of aspirin and an aspirin degradation product.

[Analysis of decomposition products in an aspirin-based drug]

Sample: Drug containing aspirin (acetyl salicylic acid)

As an important mechanism of action, aspirin reportedly suppresses the biosynthesis of prostaglandin and exhibits analgesic, fever-lowering, and anti-inflammatory actions. As a fever-lowering analgesic drug, aspirin is widely used both in prescription and over-the-counter drugs, and it is also contained in general common cold remedies.



In aqueous solution, aspirin is known to undergo decomposition by hydrolysis into salicylic acid, and it is reported that the decomposition reaction is promoted at high temperatures, in alkaline solutions, and in the presence of magnesium. (Because aspirin, even in a reagent, contains trace quantities of salicylic acid, it must be handled with care when used as a standard compound.)

[Preparation of sample]

Ultra-deionized water, 1000 mL, was added to one tablet, and the tablet was disintegrated by ultrasound treatment. After that, the mixture was filtered with a membrane filter and used as a sample.

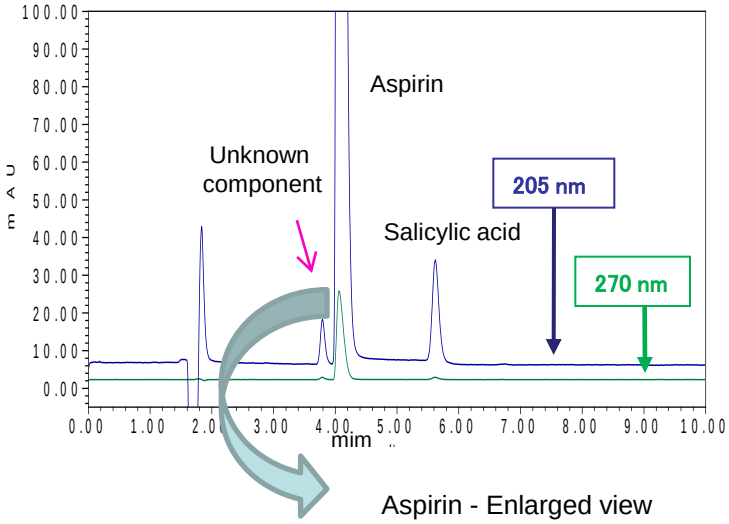
[System configuration]

Chromaster 5110 pump
Chromaster 5210 AutoSampler
Chromaster 5310 Column Oven
Chromaster 5410 UV Detector
Empower2 Data Processing System

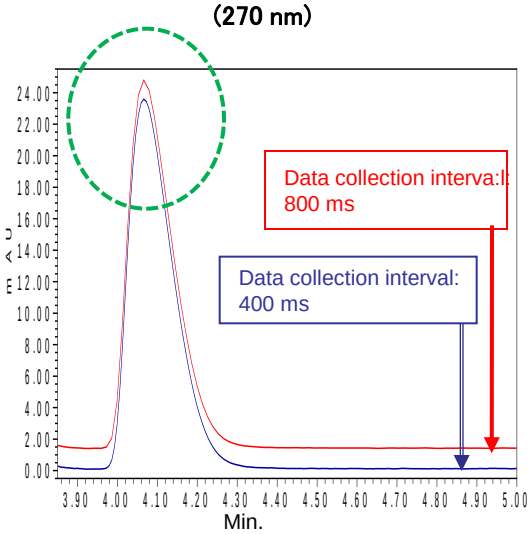
Chromaster system

[Results of analysis]

Data collection interval: 400 ms



Aspirin - Enlarged view
(270 nm)



[LC conditions]

Column	HITACHI LaChrom C18, 5 μm 4.6 mm I.D. × 150 mm
Mobile Phase	20 mM CH_3COONH_4/CH_3OH = 80/20
Flow rate	1.0 mL/min
Temperature	40° C
Detection	UV 205 nm ,270 nm
Injection vol.	20 μL

By setting a data collection interval of 400 ms, peaks can be determined accurately without missing peak tops.

Optimal condition need to be set according to given S/N values.

Whereas minute peaks associated with decomposition products and additives cannot be detected accurately at 270 nm, which is the optimal measurement wavelength for aspirin (USP, Japan Pharmacopeia: Elution test), by simultaneous detection at 205 nm, micro-peaks such as decomposition products and additives can be verified at the same time.

NOTE: These data are an example of measurement; the individual values cannot be guaranteed.

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