LT016

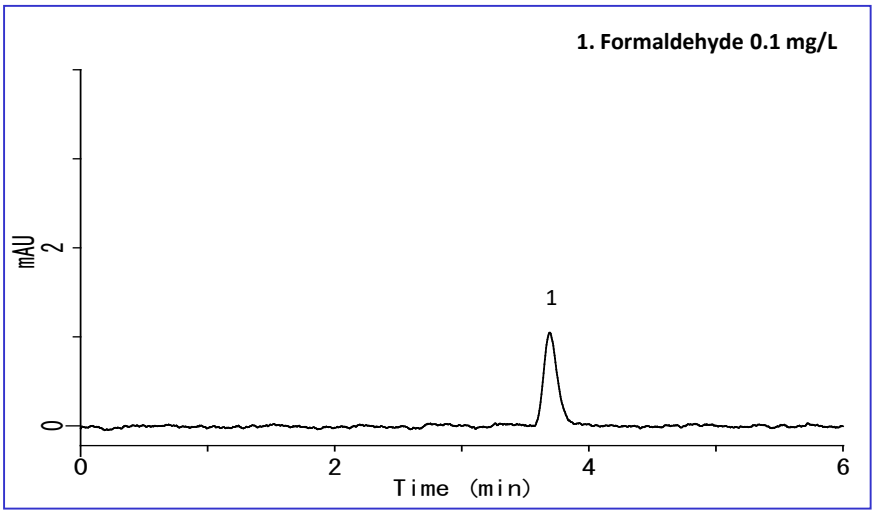
GL Sciences Inc.

Analysis of Formaldehyde in Cosmetics by Post-column HPLC

Ingredients prohibited for use in cosmetics are listed in the Cosmetics Standards (Ministry of Health and Welfare Notification No. 331, September 2000). Formaldehyde is one ingredient regulated by the standard. Analysis was performed according to the cosmetic test HPLC method. Formaldehyde in a test solution was separated using an ODS-3 column, then derivatized by reaction with acetylacetone solution to yield 3,5-diacetyl-1,4-dihydroltidine, which was then measured using a UV-visible detector.

This post-column method allows selective analysis with little or no influence from contaminants.

Example: Measurement of standard



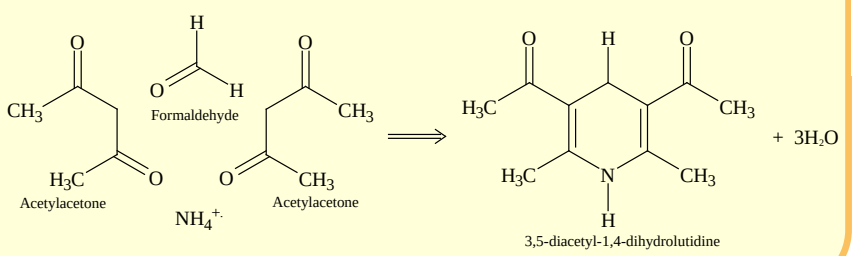
HPLC conditions

Column : Inertsil ODS-3 (5 µm, 250 x 4.6 mm I.D.)
Eluent : 6 mM Na_2HPO_4 (pH 2. 1)
Flow rate : 1.0 mL/min
Column temperature : 20 ˚C
Reaction solution : Acetylacetone solution
Flow rate of the reagent : 0.5 mL/min
Detected : VIS 413 nm
Injection volume : 10 µL

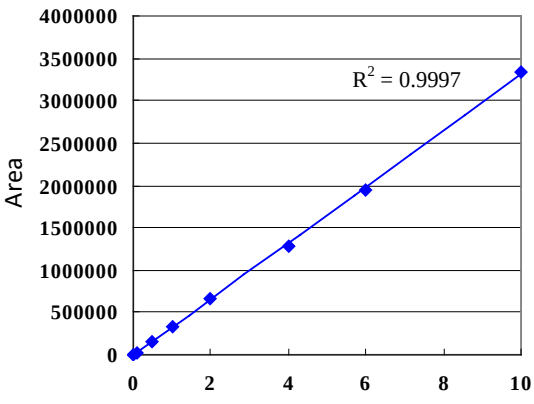
* Acetylacetone solution:
To 150 g of ammonium acetate, 3 mL of acetic acid and 2 mL of acetylacetone, add ultrapure water to make up to1L

Postcolumn reaction

One molecule of formaldehyde reacts with two molecules of acetylacetone and one molecule of ammonia, resulting in the formation of 3,5-diacetyl-1,4-dihydroltidine.

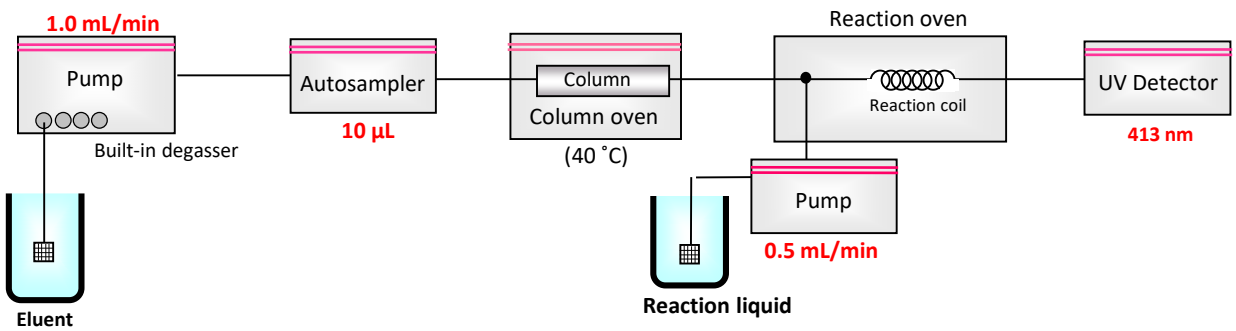


Structures are created using Chemistry 4-D Draw which is provided by ChemInnovation Software, Inc.



Calibration curve for formaldehyde

Flow diagram



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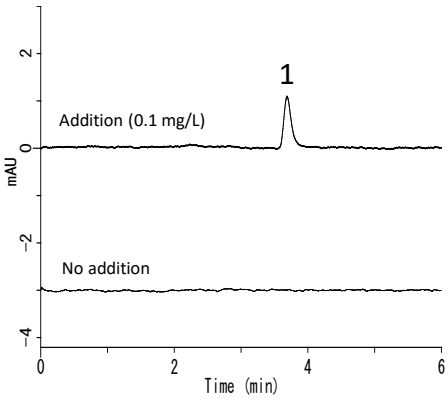
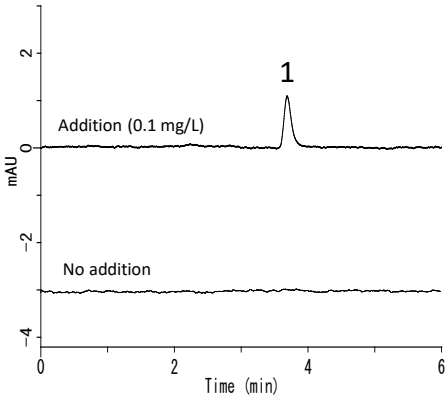
Example: Measurement of cosmetics

1. Formaldehyde

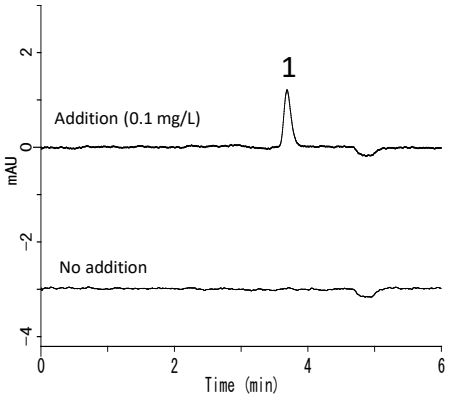
Lotion



Moisturizing agent



Shampoo



* Due to the high viscosity of moisturizers and shampoos, 2 g of sample was diluted with ultrapure water to 100 mL and used for sample measurement.

GL Sciences, Inc. Japan
22-1 Nishishinjuku 6-Chome
Shinjuku-ku, Tokyo,
163-1130, Japan
Phone: +81-3-5323-6620
Fax: +81-3-5323-6621
Email: world@gls.co.jp
Web: www.glsciences.com

GL Sciences B.V.
De Sleutel 9
5652 AS Eindhoven
The Netherlands
Phone: +31 (0)40 254 95 31
Email: info@glsciences.eu
Web: www.glsciences.eu

GL Sciences (ShangHai) Ltd.
Tower B, Room 2003,
Far East International Plaza,
NO,317 Xianxia Road,
Changning District.
Shanghai, China P.C. 200032
Phone: +86 (0)21-6278-2272
Email: contact@glsciences.com.cn
Web: www.glsciences.com.cn

GL Sciences, Inc. USA
4733 Torrance Blvd. Suite 255
Torrance, CA 90503
Phone: 310-265-4424
Fax: 310-265-4425
Email: info@glsciencesinc.com
Web: www.glsciencesinc.com

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