

Analysis of Formaldehyde in Drinking Water by HPLC and Post-column Derivatization

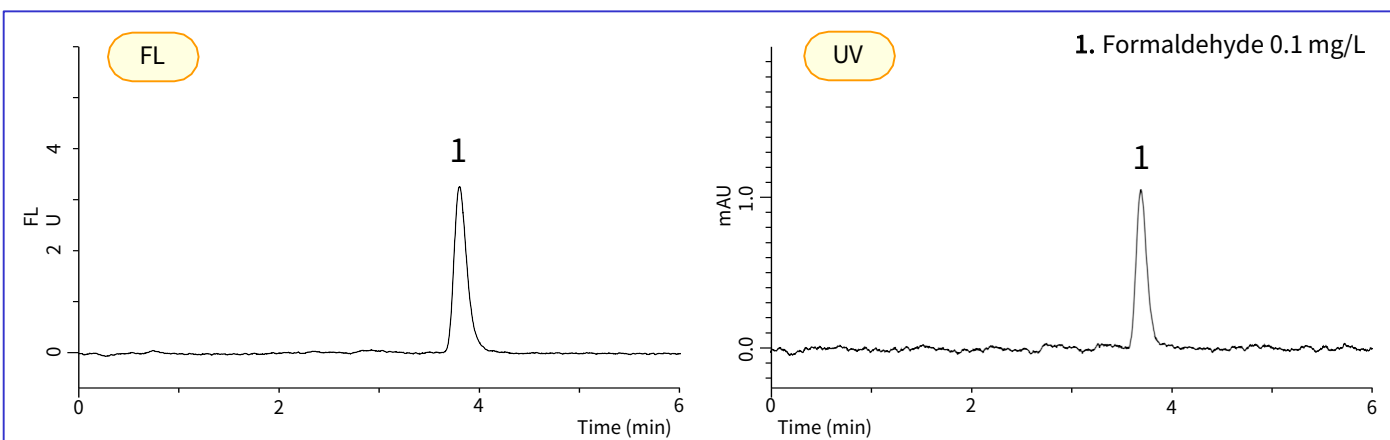
Formaldehyde is widely known as a toxic chemical, and the guideline value of 0.9 mg/L for its content in drinking water has been established by WHO. This note describes a determination method for formaldehyde in beer using HPLC equipped with a post-column derivatization system.

Formaldehyde in injected solution is separated from other compounds in the ODS column, reacted with

acetylacetone solution, and converted to fluorescent 3,5-diacetyl-1,4-dihydrolutidine.

Concentration of one-tenth of the guideline value of formaldehyde was determined with a UV/VIS detector in the HPLC system. Furthermore, fluorescence (FL) detector provided even higher sensitivity.

Chromatograms obtained from standard solution

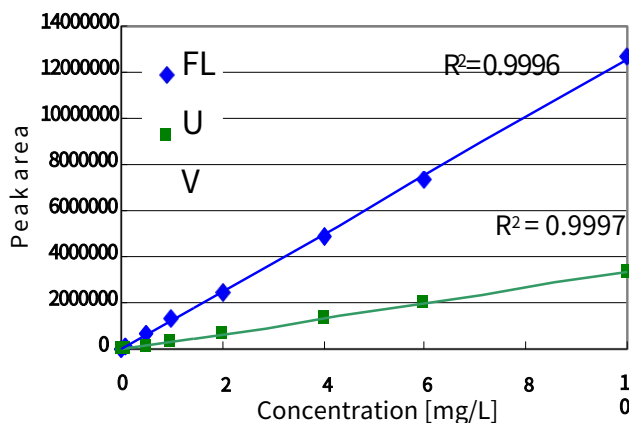


Conditions

Column	: Inertsil ODS-3 (5 μ m, 250 x 4.6 mm I.D.) Cat.No. 5020-01732
Eluent	: 6 mM Na ₂ HPO ₄ (pH 2.1, H ₃ PO ₄)
Flow rate	: 1.0 mL/min
Col. Temp.	: 20 °C
Reaction reagent	: Acetylacetone solution*
Flow rate of reaction reagent	: 0.5 mL/min
Detection	: VIS 413nm FL Ex. 445 nm, Em. 505 nm
Injection vol.	: 10 μ L

* Acetylacetone solution :

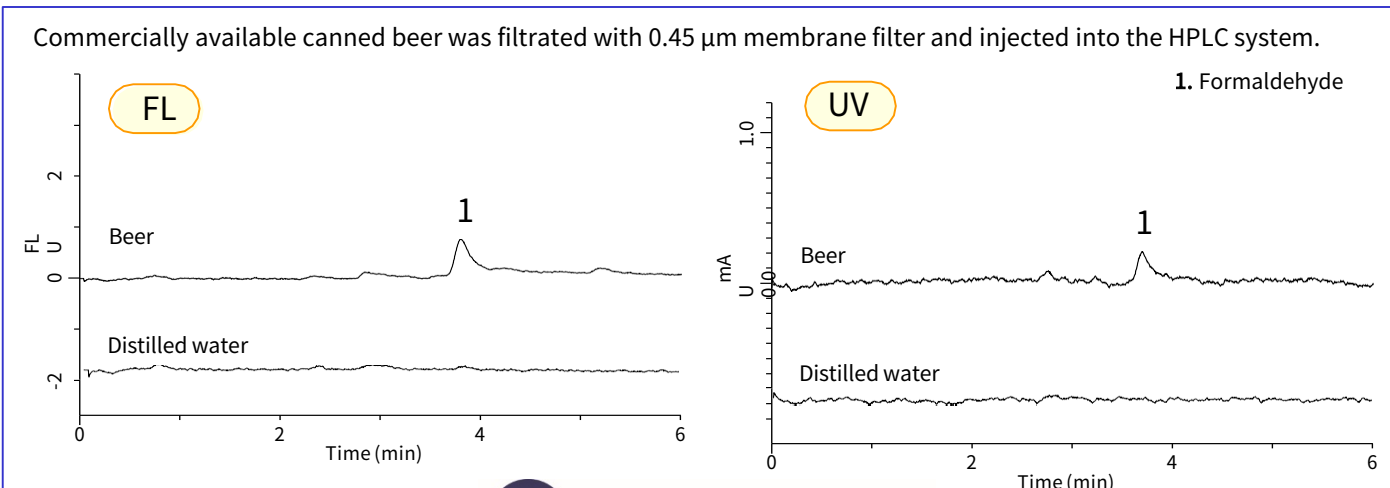
To 150 g of ammonium acetate, 3 mL of acetic acid and 2 mL of acetylacetone was added. The solution was made up to 1 L with water.



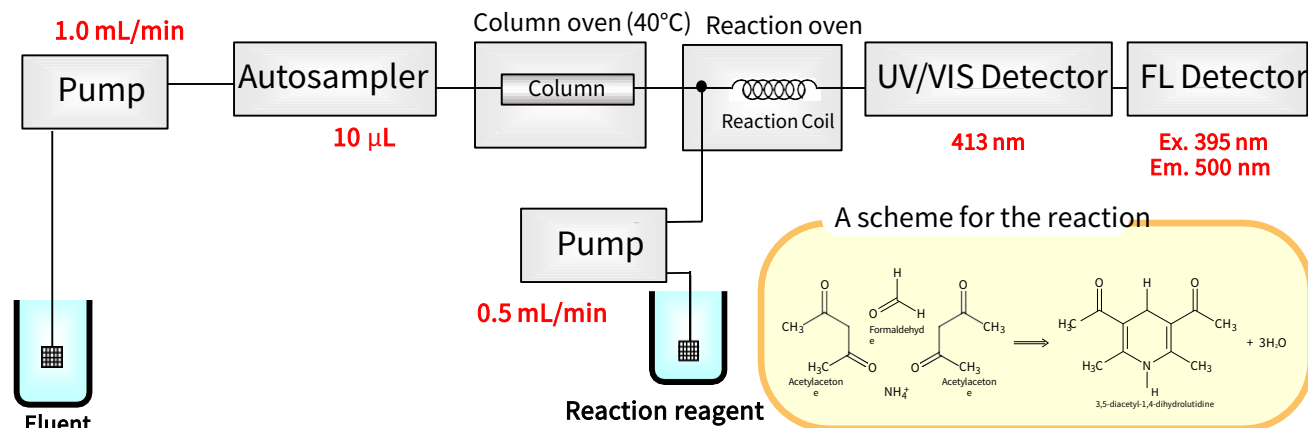
Calibration curves for formaldehyde

An analysis of canned beer

Commercially available canned beer was filtrated with 0.45 μ m membrane filter and injected into the HPLC system.



A Diagram for the HPLC System



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