



Analysis of Organic Acids using UV Detection

Organic acids are known as ingredients that determine the taste and flavor of foods. In addition to the food sector, many other areas such as pharmaceutical and chemical industries, environmental analysis, and biotechnology, analyze organic acids.

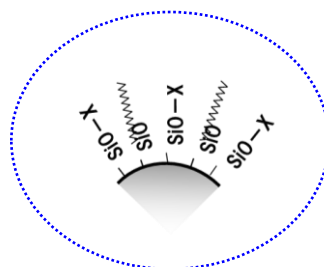
Analysis methods of organic acids include UV detection (detection of absorption of carboxyl groups), electrical conductivity detection (detection of ionic compounds), a method using pH indicators (visible absorption detection of pH changes caused by acidic components) and a post-column derivatization method for high selectivity of detection. An appropriate method must be selected based on analysis samples and purposes.

The following describes examples of analysis of organic acids using a portable UV detection system and the reversed-phase column, "LaChrom C18-AQ"*1.

Samples : Organic acid standard samples

<Concentration of Samples>	(mg/L)
1. Tartaric acid	1000
2. Formic acid	1000
3. Malic acid	1000
4. Lactic acid	1000
5. Acetic acid	1000
6. Pyroglutamic acid	100
7. Citric acid	1000
8. Fumaric acid	10
9. Succinic acid	1000
10. Propionic acid	1000

*1 "LaChrom C18-AQ" column

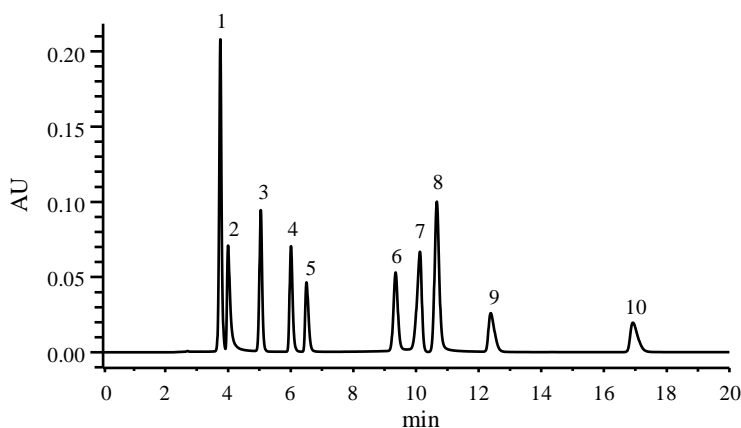


Carbon content : 12 %

By reducing the hydrophobicity of the silica surface, stable analysis even in a 100 % aqueous solution can be conducted with the ODS columns.

The columns are especially suitable for **the separation of compounds with high polarity**, such as sugars, nucleic acids, and organic acids.

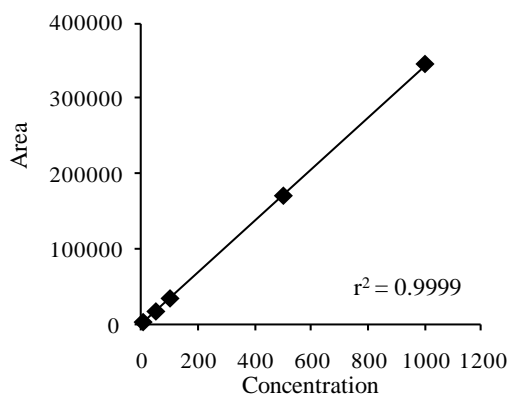
Analysis result of standard samples



[Analytical conditions]

Column : HITACHI LaChrom C18-AQ (5 μ m)
 4.6 mm I.D. \times 250 mm
 Eluent : 1 mmol/L H₂SO₄ + 8 mmol/L Na₂SO₄ (pH 2.8)
 Flow rate : 1.0 mL/min
 Column temp. : 25 $^{\circ}$ C
 Detection : UV 210 nm
 Injection vol. : 10 μ L

Linearity



* Calibration curve of acetic acid 5 - 1000 mg/L

Fairly linear Calibration curves have been obtained with the following concentration ranges:

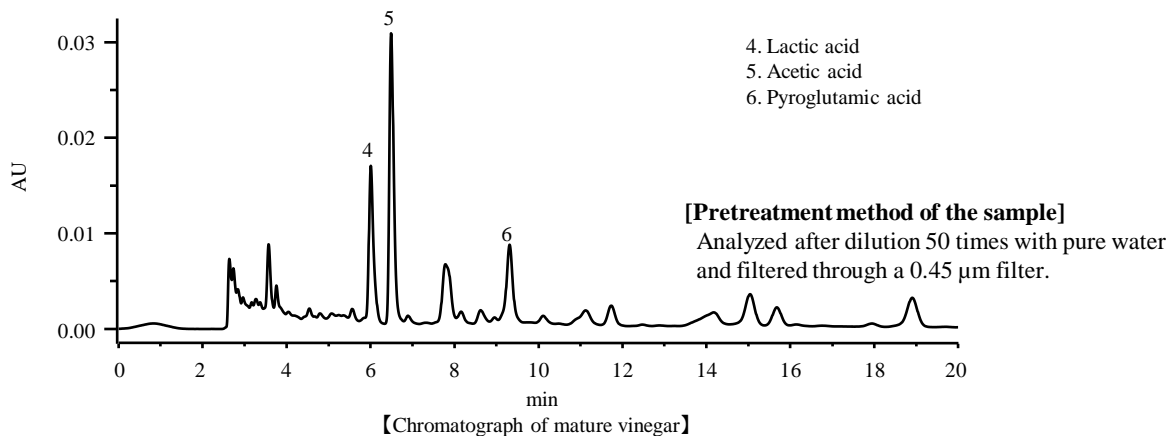
Formic acid, malic acid, lactic acid, citric acid, succinic acid, propionic acid : 5 - 1000 mg/L, tartaric acid : 2.5 - 500 mg/L, pyroglutamic acid : 0.5 - 100 mg/L, fumaric acid : 0.05 ~ 10 mg/L



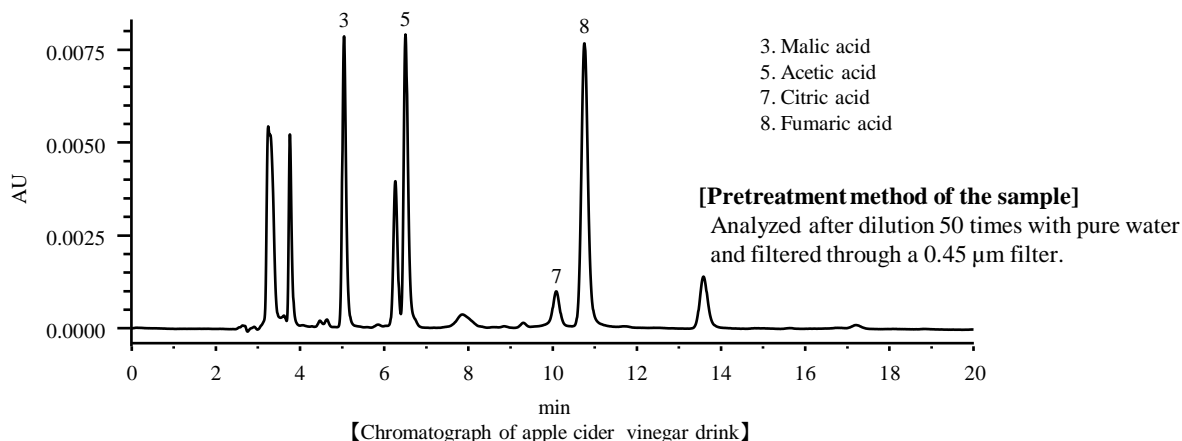
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■ Analysis example of vinegars

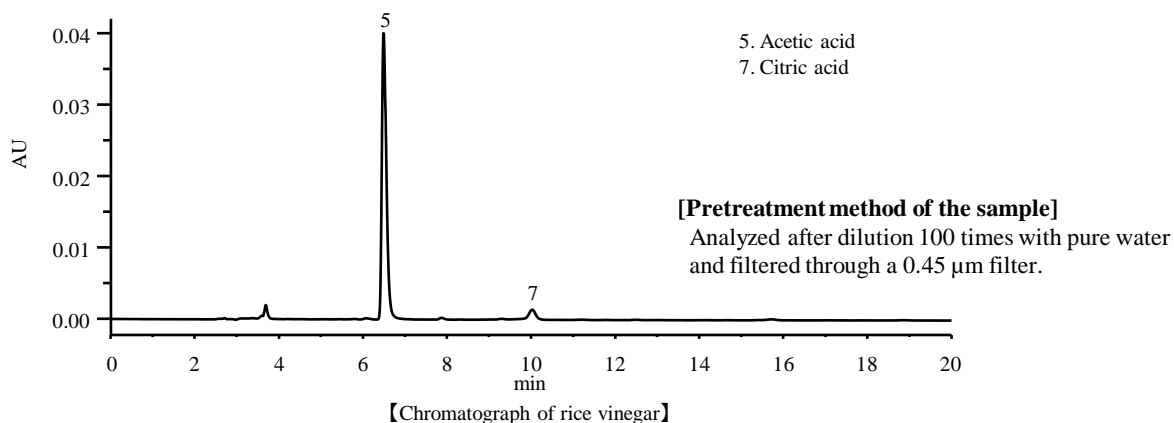
Mature vinegar



Apple cider vinegar drink



Rice vinegar



[Results]

Acetic acid, the main ingredient responsible for vinegar sourness, was detected in all samples. The data also shows that each vinegar contains some additional organic acids which impart unique flavors to each vinegar.

System configuration : Primaide 1110 Pump, 1210 Auto Sampler, 1310 Column Oven, 1410 UV

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

The system is for research use only, and is not intended for any animal or human therapeutic or diagnostic use.