Analysis of Trichloroacetate

Trichloroacetate (TCA) is used as a deproteinizing agent, food preservative, herbicide, and raw material in some drugs. Trichloroacetate is highly acidic with *pKa* (H_2O) of 0.7 and has deliquescent properties. When analyzing highly polar compounds such as trichloroacetate by HPLC, it is necessary to select an acid-resistant column which is highly retentive under acidic conditions.

The LaChrom II C18 column is packed with material comprised of organic-inorganic silica, the surface of which is modified with a polymeric material. Due to this construction, mobile phases in a wide pH range of 1-12 can be used, enabling control over the retention and selectivity of high-polarity compounds. In this study, analysis of TCA was performed using the LaChrom II C18 column with an acidic mobile phase. Examples from this analysis are introduced here.

High Performance Liquid Chromatograph Chromaster®

Analysis of Standard Solution

- ✓Standard solution: The standard solutions were prepared by weighing TCA and serially diluting with purified water.
- ✓Mobile phase: 100 mmol/L perchloric acid solution was prepared by weighing 14.35 g of perchloric acid (70%) and adding purified water to make up the volume of 1,000 mL.
- ✓The coefficient of determination obtained from the calibration curve of TCA (0.1-100 µg/mL) was 1.0000, indicating good linearity (Figure 3). An excellent result was also obtained for the reproducibility at 0.5 µg/mL (n=6).

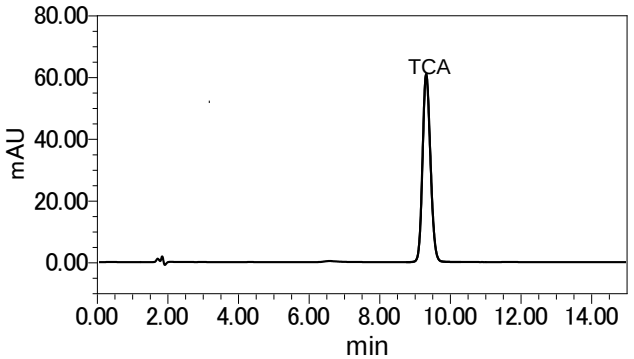

Figure 1 Chromatogram of TCA Standard Solution (100 µg/mL)

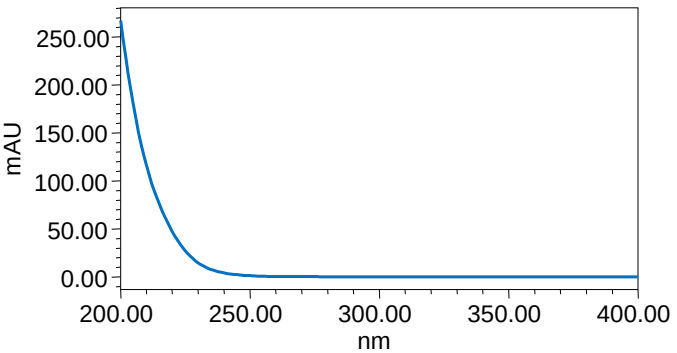

Figure 2 Absorption Spectrum of TCA Standard Solution (100 µg/mL)

Table 1 Reproducibility of TCA Standard Solution(0.5 µg/mL) (n=6)

	Retention time (min)	Area
Mean	9.382	9227
% RSD	0.013	0.426

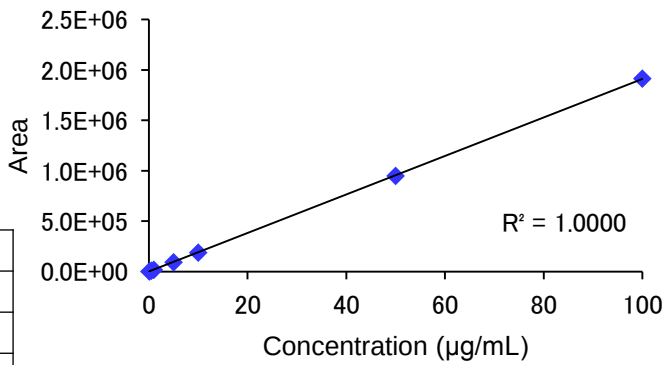

Figure 3 Calibration Curve

Table 2 Analytical Conditions

Column	LaChrom II C18 (5 µm) 4.6 mm I.D. × 150 mm
Mobilephase	100 mmol/L Perchloric acid solution (pH 1.01)
Flow rate	1.0 mL/min
Column temp	40°C
Detection wavelength	Diode Array Detector 210 nm
Injection vol.	50 µL

<Main system configuration>

Chromaster 5160 Pump, 5260 Autosampler, 5310 Column Oven, 5430 Diode Array Detector (DAD)

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

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