

Analysis of Catechins Using the Hitachi Chromaster HPLC System with UV Detection

Catechins are a group of polyphenols found in green tea that are thought to be responsible for the beneficial antioxidant properties found in this drink. Commercially available green teas, which undergo a sterilization process, have been found to possess a different profile of catechins than tea prepared in tea pots, due to the process of thermal isomerization. For this reason, measuring the levels of several catechins as well as several isomers of these catechins is of interest. Described here is a method for analysis of 9 catechins by the Hitachi Chromaster HPLC system with UV detection. The data specifically describe analysis of a standard mix of catechins as well as a sample of green tea.¹

Experimental Conditions

Module	Conditions
Pump (5110)	Mobile Phase A: 0.05% H ₃ PO ₄ , v/v Mobile Phase B: CH ₃ OH/CH ₃ CN, 3:2 v/v Gradient Program* Flow Rate: 1.0 mL/min
Autosampler (5210)	Injection Volume: 10 µL
Oven (5310)	Temperature: 40 °C
Detector (5410)	UV, 280 nm
Column	Hitachi LaChrom C18, 5 µm, 4.6 x 150 mm

*Gradient Program

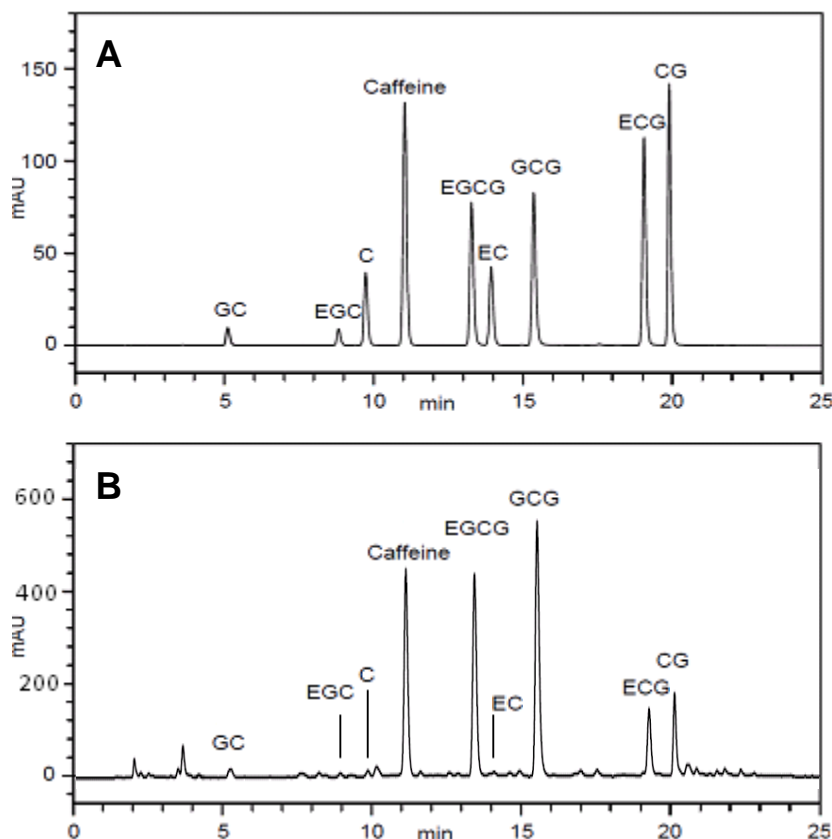
Time (min.)	A	B
0.0	90	10
15.0	75	25
25.0	40	60
25.1	90	10
40.0	90	10

Reference:
1 – Technical Data LC110005, Hitachi High Technologies Corporation.

Results – Chromatographs

A. 9-Component Mixture: 1) GC = (-)-Gallocatechin, 2) EGC = (-)-Epigallocatechin, 3) C = (-)-Catechin, 4) caffeine, 5) EGCG = (-)-Epigallocatechin gallate, 6) EC = (-)-Epicatechin, 7) GCG = (-)-Gallocatechin gallate, 8) ECG = (-)-Epicatechin gallate, 9) CG = (-)-Catechin gallate

B. Green Tea



Results – Linearity

Caffeine (1-200 mg/L)	R ² = 1.0000
GCG (1-50 mg/L)	R ² = 0.9994

Discussion

Hitachi's Chromaster liquid chromatography system with UV detection is extremely effective at simultaneous analysis of multiple polyphenol catechins in under 20 minutes.

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