

Spill the Tea, Catechins Identified with the Hamilton PRP-C18

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Application

Catechins found in tea (green, white, black), are best known for their antioxidant properties. Catechins have shown to exhibit antimicrobial activity against staphylococcus, E. Coli, and H. pylori¹ in addition to preventing oxidative degradation. Due to these attributes, catechins have found utility in multiple arenas: commercial teas, food preservation,² free radical scavenging³ and as disinfection agents.⁴ However, some quantification protocols call for HPLC run times over 20 minutes.

In an effort to optimize the HPLC resolution after extraction of catechins from a commercial green tea bag, we have chosen a 10 mM (pH 2.5) sodium phosphate buffer for the aqueous mobile phase while utilizing acetonitrile as the organic eluent. The temperature of the separation was found to be optimized at 34°C for the best resolution and peak shape. All eight compounds

were separated in under 12 minutes. The caffeine peak, #3, is highly sensitive to temperature changes under these conditions. Increased temperatures caused increased retention, whereas cooling the column to under 20°C was observed to reduce retention to under 4 minutes while leaving the remaining peak retentions relatively unchanged. Reproducibility studies are shown of the analysis from the first injection to the 500th injection, highlighting the durability found in all Hamilton Company HPLC columns.

1. Jeon J., Kim J. H., Lee C. K. *Annals of Dermatology*. 2014, 26(5), 564.
2. He, Y. H., Shahidi, F. J. *Ag. Food Chem.* 1997, 45(11), 4262.
3. Gupta D. A., Bhaskar D. J., Gupta R. K. *Bio. Sci. Pharm. Res.* 2014, 2, 8.
4. Reysaert, W. C. *Bio. Med. Res. Int.*, 2018 9105261.

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Chromatogram and Compound Results

Column Information

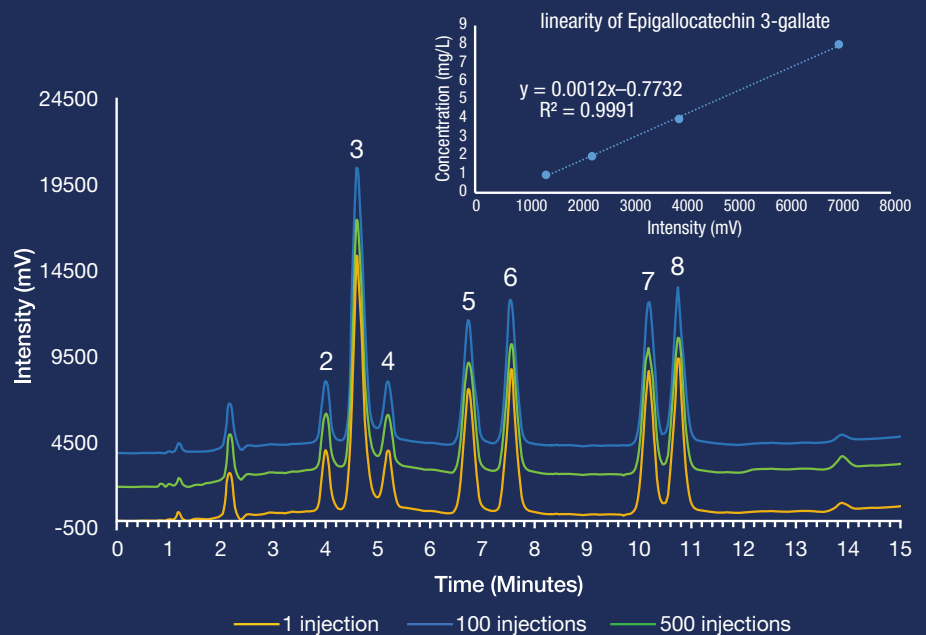
Packing Material	PRP-C18 (5 µm)
Dimensions	150 x 4.6 mm
P/N	79676

Chromatographic Conditions

Gradient	0.0–15.00 min. 10–25 %B
Temperature	34°C
Injection Volume	5 µL
Detection	UV at 214 nm
Eluent A	10 mM NaH ₂ PO ₄ (pH= 2.5)
Eluent B	Acetonitrile
Flow Rate	2.0 mL/min

Compounds:

- 1: Gallocatechin
- 2: Catechin
- 3: Caffeine
- 4: Epicatechin
- 5: Epigallocatechin 3-gallate
- 6: Gallocatechin 3-gallate
- 7: Catechin 3-gallate
- 8: Epicatechin 3-gallate



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