

Identification of Decaffeinated Green Tea Dry Extract according to USP DSC 2018

A-111.1



Keywords

Camellia sinensis (L.), Dietary supplement, USP, HPTLC

Introduction

Powdered Decaffeinated Green Tea Extract is prepared from the young, unfermented leaf and leaf buds of *Camellia sinensis* (L.) Kuntze (Fam. Theaceae), also known as *Thea sinensis* L.

The proposed method has been submitted for consideration in the USP DSC 2018.

Scope

This HPTLC method identifies Powdered Decaffeinated Green Tea Extract as defined by USP DSC 2018.

Recommended devices

Automatic TLC Sampler (ATS 4), Automatic Developing Chamber (ADC 2), Derivatizer, TLC Visualizer, *visionCATS*

Samples

50 mg/mL of Decaffeinated Green Tea Extract in methanol and water (7:3, v/v) sonicated for 10 min, and centrifuged. Use the clear supernatant.

Standards

Standard solution A: 0.5 mg/mL of USP chlorogenic acid RS, (-)-epigallocatechin, and USP caffeine RS in methanol

Standard solution B: 50 mg/mL of USP Powdered Decaffeinated Green Tea Extract RS in 70% methanol

NOTE: The presented results are to be regarded as examples only!

Please contact CAMAG for more application notes and products!

Chromatography

Stationary phase	HPTLC Si 60 F ₂₅₄ , 20 x 10 cm (Merck)
Sample application	2 µL of each standard and sample solution are applied bandwise with ATS 4, 15 tracks, band length 8 mm, track distance 11.4 mm, distance from left edge 20 mm, distance from lower edge 8 mm
Developing solvent	Toluene, acetone, formic acid (9:9:2; v/v/v)
Development	In the ADC 2 with unsaturated chamber. Plates were conditioned at 33% relative humidity for 10 min using a saturated solution of magnesium chloride (MgCl ₂).
Developing distance	70 mm (from the lower edge)
Plate drying	Drying 5 min in the ADC 2
Documentation	With the TLC Visualizer: A) underivatized, under UV 254 nm B) underivatized, under UV 366 nm (not normalized) C) underivatized, under white light D) derivatized A, under UV 366 nm (normalized to Standard solution B) E) derivatized A+B, under UV 366 nm (normalized to Standard solution B) F) derivatized A+B, under white light
Derivatization reagent A:	NP Reagent (for spraying): 1 g of diphenylborinic acid aminoethylester is dissolved in 100 mL of methanol Heat at 100 °C for 3 min, cool to room temperature, and then derivatize
Derivatization reagent B:	Anisaldehyde reagent: Preparation: Place 85 mL of methanol in a 100 mL glass bottle, and cool it down in a water-ice cubes-salt bath or in a freezer. To the ice-cold methanol, add 10 mL of acetic acid and 5 mL of sulfuric acid, slowly and carefully, and mix well. Allow the mixture to cool to room temperature, and then add 0.5 mL of p-anisaldehyde. Use: Derivatize subsequently to derivatizing with NP reagent, then heat at 100 °C for 3 min

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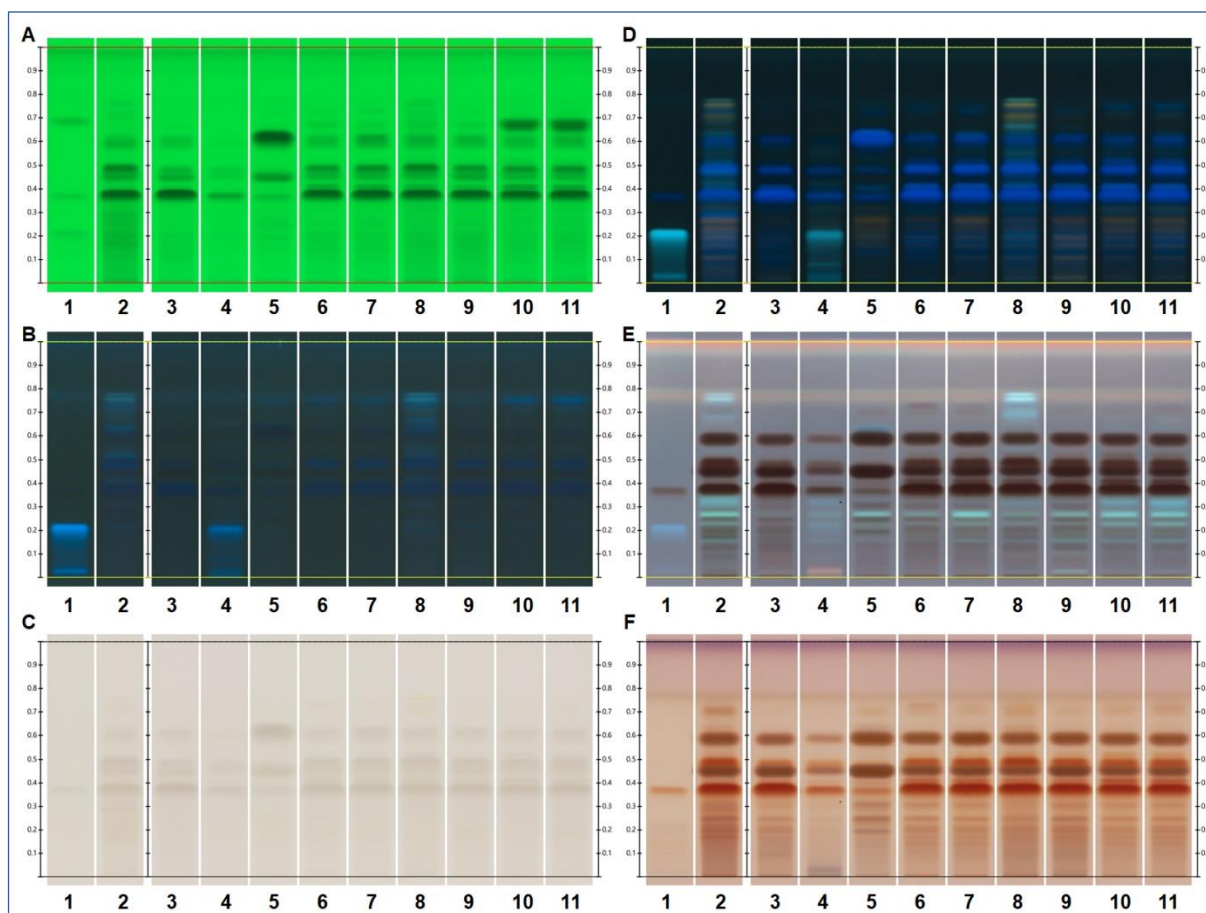
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Results

System Suitability Test (SST) under UV 254 nm prior to derivatization:

- Chlorogenic acid shows a zone at R_F 0.20
- (-)-Epigallocatechin shows a zone at R_F 0.38
- Caffeine shows a zone at R_F 0.71

Identification of Decaffeinated Green Tea Extract



A: HPTLC under UV 254 nm prior to derivatization; B: HPTLC under UV 366 nm prior to derivatization; C: HPTLC under white light prior to derivatization; D: HPTLC under UV 366 nm after derivatization (NP); E: HPTLC under UV 366 nm after derivatization (NP/Anisaldehyde); F: HPTLC under white light after derivatization (NP/Anisaldehyde). Track 1: USP chlorogenic acid RS (0.5 mg/mL), (-)-epigallocatechin (0.5 mg/mL), and USP caffeine RS (0.5 mg/mL), with increasing R_F ; track 2: USP Powdered Decaffeinated Green Tea Extract RS (50 mg/mL); tracks 3-11: Decaffeinated Green Tea finished products and dry extract.

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