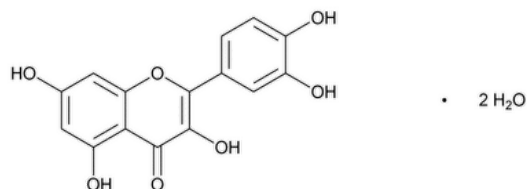


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Quercetin



$C_{15}H_{10}O_7$ 302.2
 2-(3,4-Dihydroxyphenyl)-3,5,7-trihydroxy-4H-1-benzopyran-4-one;
 Quercetin dihydrate 338.2 CAS RN®: 6151-25-3.

DEFINITION

Quercetin contains NLT 98.0% and NMT 102.0% of quercetin ($C_{15}H_{10}O_7$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

- **A.** ▲ [SPECTROSCOPIC IDENTIFICATION TESTS \(197\)](#), [Infrared Spectroscopy: 197K](#) ▲ (CN 1-MAY-2020) •

[NOTE—The substance is a dihydrate.]

Change to read:

- **B.** ▲ [SPECTROSCOPIC IDENTIFICATION TESTS \(197\)](#), [Ultraviolet-Visible Spectroscopy: 197U](#) ▲ (CN 1-MAY-2020)

Wavelength range: 210–450 nm

Sample solution: 10 µg/mL of Quercetin in methanol. Filter if necessary.

Acceptance criteria: The spectrum exhibits two absorption maxima at 255 nm and 371 nm. The absorptivity at the maximum at 371 nm is 75.5–80.0, calculated on the anhydrous basis.

- **C. HPLC IDENTIFICATION TEST**

Analysis: Proceed as directed in the Assay.

Acceptance criteria: The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay.

ASSAY

- **PROCEDURE**

Mobile phase: Methanol, water, and phosphoric acid (100:100:1)

System suitability solution: 0.02 mg/mL each of [USP Quercetin RS](#), [USP Kaempferol RS](#), and [USP Isorhamnetin RS](#) in methanol

Standard solution: Transfer 10 mg of [USP Quercetin RS](#) to a 50-mL volumetric flask, and add 20 mL of methanol to dissolve. Add 20 mL of water, mix, and dilute with methanol to volume.

Sample solution: Transfer 10 mg of Quercetin to a 50-mL volumetric flask, and add 20 mL of methanol to dissolve. Add 20 mL of water, mix, and dilute with methanol to volume.

Chromatographic system

(See [Chromatography \(621\)](#), [System Suitability](#).)

Mode: LC

Detector: UV 370 nm

Column: 4.6-mm × 25-cm; packing L1

Flow rate: 1.0 mL/min

Injection volume: 20 µL

System suitability

Samples: *System suitability solution* and *Standard solution*

[NOTE—The relative retention times for quercetin, kaempferol, and isorhamnetin are 1.0, 1.8, and 2.0, respectively.]

Suitability requirements

Resolution: NLT 1.5 between kaempferol and isorhamnetin, *System suitability solution*

Column efficiency: NLT 2000 theoretical plates

Relative standard deviation: NMT 2.0%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of Quercetin in the portion of Sample taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

C_S = concentration of [USP Quercetin RS](#) in the *Standard solution* (mg/mL)

C_U = concentration of Quercetin in the *Sample solution* (mg/mL)

Acceptance criteria: 98.0%–102.0% on the anhydrous basis

IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#): NMT 0.1%

• **KAEMPFEROL AND OTHER RELATED COMPOUNDS**

Mobile phase, System suitability solution, Standard solution, Sample solution, and System suitability: Proceed as directed in the Assay.

Chromatographic system: Proceed as directed in the Assay but use UV detection at 270 nm.

Analysis

Sample: *Sample solution*

Calculate the percentage of each individual impurity in the portion of the *Sample* taken:

$$\text{Result} = (r_U/r_T) \times 100$$

r_U = peak response of each individual impurity from the *Sample solution*

r_T = sum of the responses of all the peaks from the *Sample solution*

Acceptance criteria

Kaempferol: NMT 0.5%

Individual impurities: NMT 0.1%

Total impurities: NMT 2.0%

SPECIFIC TESTS

• [WATER DETERMINATION, Method Ia \(921\)](#)

Sample: 100 mg

Acceptance criteria: NMT 12.0%

ADDITIONAL REQUIREMENTS

• **PACKAGING AND STORAGE:** Preserve in well-closed, tight, light-resistant containers.

• [USP REFERENCE STANDARDS \(11\)](#)

[USP Isorhamnetin RS](#)

[USP Kaempferol RS](#)

[USP Quercetin RS](#)

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
QUERCETIN	Maria Monagas Scientific Liaison	BDSHM2020 Botanical Dietary Supplements and Herbal Medicines