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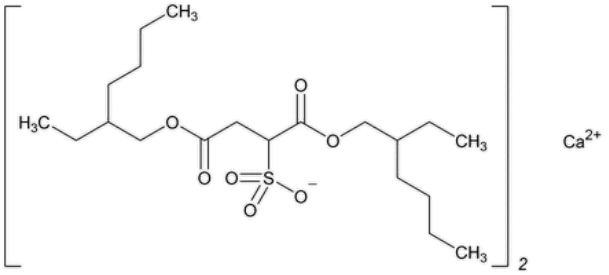
Docusate Calcium



$C_{40}H_{74}CaO_{14}S_2$ 883.22

Butanedioic acid, sulfo-, 1,4-bis(2-ethylhexyl) ester, calcium salt;

1,4-Bis(2-ethylhexyl) sulfosuccinate, calcium salt CAS RN®: 128-49-4; UNII: 6K7YS503HC.

DEFINITION

Docusate Calcium contains NLT 91.0% and NMT 100.5% of docusate calcium ($C_{40}H_{74}CaO_{14}S_2$), calculated on the anhydrous basis.

IDENTIFICATION

• **A.**

Sample: Place a small piece of Docusate Calcium on a salt plate, add 1 drop of acetone, and promptly cover with another salt plate. Rub the plates together to dissolve the specimen, slide the plates apart, and allow the acetone to evaporate.

Acceptance criteria: The IR absorption spectrum of the film exhibits maxima only at the same wavelengths as that of a similar preparation of USP Docusate Calcium RS.

• **B.**

Sample: 25 mg

Analysis: Dissolve the *Sample* in 2 mL of acetone. Add 2 mL of water, and add 2 drops of sulfuric acid.

Acceptance criteria: A white precipitate is formed.

• **C. Thin-Layer Chromatography**

Standard solution: 10 mg/mL of USP Docusate Calcium RS in isopropyl alcohol

Sample solution: 10 mg/mL of Docusate Calcium in isopropyl alcohol

Chromatographic system

(See *Chromatography ⟨621⟩, Thin-Layer Chromatography*.)

Mode: TLC

Adsorbent: 0.25-mm layer of chromatographic silica gel

Application volume: 10 µL. [Note—Apply with the aid of a stream of nitrogen.]

Developing solvent system: Ethyl acetate, ammonium hydroxide, and alcohol (5:2:2)

Analysis

Samples: *Standard solution* and *Sample solution*

Allow the spots to dry, and develop the chromatogram in the *Developing solvent system* until the solvent front has moved three-fourths of the length of the plate. Remove the plate from the developing chamber, mark the solvent front, and allow the solvent to evaporate. Expose the plate to iodine vapors in a closed chamber for about 30 min, and locate the spots.

Acceptance criteria: The R_F value of the principal spot of the *Sample solution* corresponds to that of the *Standard solution*.

ASSAY

• **Procedure**

Solution A: 2.500 g/L of tetra-*n*-butylammonium iodide in water

Solution B: A mixture of 100 g/L of anhydrous sodium sulfate and 10 g/L of sodium carbonate in water

Sample: 50 mg

Analysis: Dissolve the *Sample* in 50 mL of chloroform in a glass-stoppered, 250-mL conical flask. Add 50 mL of *Solution B* and 500 µL of bromophenol blue TS. Titrate with *Solution A* until 1 mL from the endpoint, and shake the stoppered flask vigorously for 2 min. Continue the titration in 2-drop increments, shaking vigorously for 10 s after each addition, and then allow the flask to stand for 10 s. Continue the titration until the chloroform layer just assumes a blue color. Each mL of *Solution A* is equivalent to 2.989 mg of docusate calcium ($C_{40}H_{74}CaO_{14}S_2$).

Acceptance criteria: 91.0%–100.5% on the anhydrous basis

IMPURITIES

- **Residue on Ignition ⟨281⟩:** 14.5%–16.5%, calculated on the anhydrous basis
- **Limit of Bis(2-ethylhexyl) Maleate**

Mobile phase: Alcohol and water (78:22), filtered and degassed

Standard solution: 80 µg/mL of USP Bis(2-ethylhexyl) Maleate RS in alcohol

Sample solution: 20 mg/mL of Docusate Calcium in alcohol. [Note—If necessary, warm the mixture using the steam bath to achieve a complete dissolution.]

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: LC

Detector: UV 210 nm

Column: 4.6-mm × 3-cm; 3.5-µm packing L1

Column temperature: 30°

Flow rate: 1 mL/min

Injection volume: 3 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of bis(2-ethylhexyl) maleate in the portion of Docusate Calcium taken:

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

r_U = peak response of bis(2-ethylhexyl) maleate from the *Sample solution*

r_S = peak response of bis(2-ethylhexyl) maleate from the *Standard solution*

C_S = concentration of USP Bis(2-ethylhexyl) Maleate RS in the *Standard solution* (mg/mL)

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

Acceptance criteria: NMT 0.4%

SPECIFIC TESTS

- **Water Determination, *Method I*⟨921⟩:** NMT 2.0%
- **Clarity of Solution**

Sample solution: 25 g in 94 mL of alcohol

Acceptance criteria: The *Sample solution* does not develop a haze within 24 h when maintained at a temperature of 25 ± 1°.

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in well-closed containers.
- **USP Reference Standards ⟨11⟩**

USP Bis(2-ethylhexyl) Maleate RS	$C_{20}H_{36}O_4$	340.51
USP Docusate Calcium RS		

Topic/Question	Contact	Expert Committee
DOCUSATE CALCIUM	Documentary Standards Support	SM32020 Small Molecules 3

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