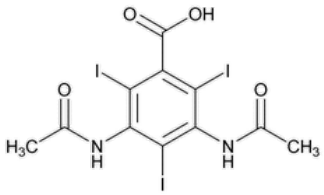
Status: Currently Official on 14-Feb-2025
Official Date: Official as of 01-Jan-2018
Document Type: USP Monographs
DocId: GUID-347E237A-6E73-4910-9F0B-84F9FD1DE9E1_3_en-US
DOI: https://doi.org/10.31003/USPNF_M24590_03_01
DOI Ref: 7pu6k

Diatrizoic Acid



$C_{11}H_9I_3N_2O_4$(anhydrous) 613.91
$C_{11}H_9I_3N_2O_4 \cdot 2H_2O$ 649.95
Benzoic acid, 3,5-bis(acetylamino)-2,4,6-triiodo-;
3,5-Diacetamido-2,4,6-triiodobenzoic acid CAS RN®: 117-96-4.
Dihydrate CAS RN®: 50978-11-5.

DEFINITION

Diatrizoic Acid is anhydrous or contains two molecules of water of hydration. It contains NLT 98.0% and NMT 102.0% of diatrizoic acid ($C_{11}H_9I_3N_2O_4$), calculated on the anhydrous basis.

IDENTIFICATION

• **A. Thin-Layer Chromatographic Identification Test ⟨201⟩**

Solution A: Sodium hydroxide in methanol (0.8 in 1000)

Standard solution: 1 mg/mL in *Solution A*

Sample solution: 1 mg/mL in *Solution A*

Developing solvent system: Chloroform, methanol, and ammonium hydroxide (20:10:2)

Analysis: Use short-wavelength UV light to locate the spots.

Acceptance criteria: Meets the requirements

• **B.**

Sample: 500 mg

Analysis: Heat the *Sample* in a suitable crucible.

Acceptance criteria: Violet vapors are evolved.

ASSAY

• **Procedure**

Sample: 300 mg

Titrimetric system

(See *Titrimetry ⟨541⟩*.)

Mode: Direct titration

Titrant: 0.05 N silver nitrate VS

Endpoint detection: Visual

Analysis: Transfer the *Sample* to a glass-stoppered, 125-mL conical flask, add 30 mL of 1.25 N sodium hydroxide and 500 mg of powdered zinc, connect the flask to a reflux condenser, and reflux the mixture for 1 h. Cool the flask to room temperature, rinse the condenser with 20 mL of water, disconnect the flask from the condenser, and filter the mixture. Rinse the flask and the filter thoroughly, adding the rinsings to the filtrate. Add 5 mL of glacial acetic acid and 1 mL of tetrabromophenolphthalein ethyl ester TS. Titrate the *Sample* with *Titrant* until the yellow precipitate just turns green. Each mL of *Titrant* is equivalent to 10.23 mg of diatrizoic acid ($C_{11}H_9I_3N_2O_4$).

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

IMPURITIES

• **Residue on Ignition ⟨281⟩:** NMT 0.1%

• **Free Aromatic Amine**

Standard stock solution: Dissolve a suitable quantity of USP Diatrizoic Acid Related Compound A RS in 0.1 N sodium hydroxide. Use 0.2 mL of 0.1 N sodium hydroxide for each 5.0 mg of Standard, and dilute with water to obtain 500 µg/mL.

Standard solution: Transfer 4 mL of water, 10 mL of 0.1 N sodium hydroxide, and 1.0 mL of a *Standard stock solution* to a 50-mL volumetric flask.

Sample solution: Transfer 1.0 g to a 50-mL volumetric flask, and add 12.5 mL of water and 2.5 mL of 0.1 N sodium hydroxide.

Blank: Transfer 5 mL of water and 10 mL of 0.1 N sodium hydroxide to a 50-mL volumetric flask.

Analysis: Treat each flask as follows. Add 25 mL of dimethyl sulfoxide, insert the stopper, and mix by swirling gently. Chill in an ice bath in the dark for 5 min. In conducting the following steps, keep the flasks in the ice bath and in the dark as much as possible until all of the reagents have been added.

Slowly add 2 mL of hydrochloric acid, and allow to stand for 5 min. Add 2 mL of sodium nitrite solution (20 mg/mL), and allow to stand for 5 min. Add 1 mL of sulfamic acid solution (80 mg/mL), shake, and allow to stand for 5 min. [Note—Considerable pressure is produced.] Add 2 mL of a solution (1 mg/mL) of *N*-(1-naphthyl)-ethylenediamine dihydrochloride in dilute propylene glycol (700 mg/mL). Remove the flasks from the ice bath and from storage in the dark, and allow to stand in a water bath at 22°–25° for 10 min. Shake gently and occasionally during this period, releasing the pressure by loosening the stopper. Dilute with water to volume.

Instrumental conditions

(See *Ultraviolet-Visible Spectroscopy ⟨857⟩*.)

Mode: Vis

Analytical wavelength: 465 nm

Cell: 1 cm

Analysis: Within 5 min from the time of diluting the solutions in all three flasks to 50 mL, concomitantly determine the absorbances of the solutions.

Acceptance criteria: 0.05%; the absorbance of the *Sample solution* is NMT that of the *Standard solution*.

SPECIFIC TESTS

• **Water Determination, *Method I*⟨921⟩:** NMT 1.0% (anhydrous form), and between 4.5% and 7.0% (hydrous form)

• **Iodine and Iodide**

Sample solution: Suspend 10.0 g in 10 mL of water, and add in small portions, with stirring, 1.5 mL of sodium hydroxide solution (400 mg/mL). When the solution is complete, adjust to a pH between 7.0 and 7.5 with a dilute solution (8 mg/mL) of sodium hydroxide or hydrochloric acid, and dilute with water to 20 mL.

Analysis: Dilute 4.0 mL of *Sample solution* with 20 mL of water in a 50-mL centrifuge tube provided with a stopper, add 5 mL of toluene and 5 mL of 2 N sulfuric acid, shake, and centrifuge: the toluene layer shows no red color. Add 1 mL of sodium nitrite solution (20 mg/mL), shake, and centrifuge.

Acceptance criteria: NMT 0.02% of iodide; any red color in the toluene layer is not darker than that obtained when a mixture of 2.0 mL of potassium iodide solution (0.25 mg/mL) and 22 mL of water is substituted for the solution under test.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in well-closed containers. Store at room temperature.

• **Labeling:** Label it to indicate whether it is anhydrous or hydrous.

• **USP Reference Standards ⟨11⟩**

USP Diatrizoic Acid RS

USP Diatrizoic Acid Related Compound A RS

5-Acetamido-3-amino-2,4,6-triiodobenzoic acid.

$C_9H_7I_3N_2O_3$ 571.88

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
DIATRIZOIC ACID	Documentary Standards Support	SM42020 Small Molecules 4

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. Information currently unavailable
Current DocID: GUID-347E237A-6E73-4910-9F0B-84F9FD1DE9E1_3_en-US
Previous DocID: GUID-347E237A-6E73-4910-9F0B-84F9FD1DE9E1_1_en-US
DOI: https://doi.org/10.31003/USPNF_M24590_03_01
DOI ref: 7pu6k