

Flow rate: Adjust the flow rate to 1.5 mL per minute.

Time span of measurement: About 4.3 times as long as the retention time of iopamidol.

System suitability—

System performance: Dissolve 1 mL of the sample solution and 0.010 g of *N,N'*-bis[2-hydroxy-1-(hydroxymethyl)ethyl]-5-hydroxyacetyl-amino-2,4,6-triiodoisophthalamide in water to make 100 mL. When the procedure is run with 20 μ L of this solution under the above operating conditions, *N,N'*-bis[2-hydroxy-1-(hydroxymethyl)ethyl]-5-hydroxyacetyl-amino-2,4,6-triiodoisophthalamide and iopamidol are eluted in this order with the resolution between these peaks being not less than 7.

System repeatability: When the test is repeated 6 times with 20 μ L of the standard solution under the above operating conditions, the relative standard deviation of the peak areas of *N,N'*-bis[2-hydroxy-1-(hydroxymethyl)ethyl]-5-hydroxyacetyl-amino-2,4,6-triiodoisophthalamide is not more than 1.0%.

Loss on drying Not more than 0.30% (1 g, 105°C, 3 hours).

Residue on ignition Not more than 0.10% (1 g).

Assay Weigh accurately about 0.5 g of Iopamidol, previously dried, transfer to a saponification flask, dissolve in 40 mL of sodium hydroxide TS, add 1 g of zinc powder, boil for 30 minutes under a reflux condenser, cool, and filter. Wash the flask and the filter paper with 50 mL of water, and combine the washing with the filtrate. Add 5 mL of acetic acid (100) to this solution, and titrate with 0.1 mol/L silver nitrate VS (potentiometric titration).

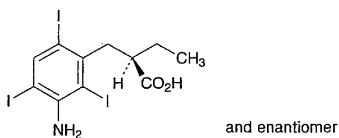
Each mL of 0.1 mol/L silver nitrate VS
= 25.903 mg of $C_{17}H_{22}I_3N_3O_8$

Containers and storage Containers—Well-closed containers.

Storage—Light-resistant.

Iopanoic Acid

イオパノ酸



$C_{11}H_{12}I_3NO_2$: 570.93
(*RS*)-2-(3-Amino-2,4,6-triiodobenzyl)butanoic acid
[96-83-3]

Iopanoic Acid, when dried, contains not less than 98.0% of $C_{11}H_{12}I_3NO_2$.

Description Iopanoic Acid occurs as a light yellowish white, crystalline powder. It has a faint, characteristic odor.

It is soluble in ethanol (95) and in acetone, sparingly soluble in acetic acid (100) and in diethyl ether, and practically insoluble in water.

It dissolves in sodium hydroxide TS.

It is gradually colored by light.

Identification (1) Heat 0.1 g of Iopanoic Acid over a flame: a purple gas is evolved.

(2) Determine the infrared absorption spectrum of Iopanoic Acid, previously dried, as directed in the potassium bromide disk method under the Infrared Spectrophotometry, and compare the spectrum with the Reference Spectrum: both spectra exhibit similar intensities of absorption at the same wave numbers.

Melting point 152 – 158°C (with decomposition).

Purity (1) Soluble halides—Dissolve 2.5 g of Iopanoic Acid in 20 mL of water and 2.5 mL of ammonia TS, and add 20 mL of dilute nitric acid and water to make 100 mL. Allow the mixture to stand for 15 minutes with occasional shaking, and filter. Discard the first 10-mL portion of the filtrate, transfer the subsequent 25 mL of the filtrate to a Nessler tube, and add ethanol (95) to make 50 mL. Proceed as directed in the Chloride Limit Test using this solution as the test solution. Prepare the control solution as follows: to 0.10 mL of 0.01 mol/L hydrochloric acid VS add 6 mL of dilute nitric acid and water to make 25 mL, then add ethanol (95) to make 50 mL.

(2) Iodine—Dissolve 0.20 g of iopanoic Acid in 2.0 mL of sodium hydroxide TS, and 2.5 mL of 0.5 mol/L sulfuric acid TS, and allow to stand for 10 minutes with occasional shaking. Add 5 mL of chloroform, shake vigorously, and allow to stand: the chloroform layer remains colorless.

(3) Heavy metals—Proceed with 1.0 g of Iopanoic Acid according to Method 2, and perform the test. Prepare the control solution with 2.0 mL of Standard Lead Solution (not more than 20 ppm).

(4) Arsenic—Prepare the test solution with 1.0 g of Iopanoic Acid according to Method 3, and perform the test using Apparatus B (not more than 2 ppm).

Loss on drying Not more than 0.5% (1 g, 105°C, 2 hours).

Residue on ignition Not more than 0.10% (1 g).

Assay Weigh accurately about 0.4 g of Iopanoic Acid, previously dried, and add 1 g of zinc powder and 10 mL of acetic acid (100). Boil for 30 minutes under a reflux condenser, add 30 mL of water through the condenser, and filter through absorbent cotton. Wash the flask and the cotton with two 20-mL portions of water, and combine the filtrate and washings. After cooling, titrate with 0.1 mol/L silver nitrate VS until the color of the precipitate changes from yellow to green (indicator: 1 mL of tetrabromophenolphthalein ethyl ester TS).

Each mL of 0.1 mol/L silver nitrate VS
= 19.031 mg of $C_{11}H_{12}I_3NO_2$

Containers and storage Containers—Tight containers.

Storage—Light-resistant.

Iopanoic Acid Tablets

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Iopanoic Acid Tablets contain not less than 95% and not more than 105% of the labeled amount of

iopanoic acid ($C_{11}H_{12}I_3NO_2$; 570.93).

Method of preparation Prepare as directed under Tablets, with Iopanoic Acid.

Identification (1) Weigh a quantity of powdered Iopanoic Acid Tablets, equivalent to 0.25 g of Iopanoic Acid according to the labeled amount, shake with 10 mL of acetone for 5 minutes, and centrifuge. Evaporate 5 mL of the supernatant liquid on a water bath to dryness, dry the residue at 105°C for 1 hour, dissolve 1 mg of the dried matter in 1 mL of acetone, and add 3 mL of dilute hydrochloric acid: the solution responds to the Qualitative Tests for primary aromatic amines, and a red color develops.

(2) Heat 0.1 g of the dried matter obtained in (1) over a flame: a purple gas is evolved.

(3) Determine the infrared absorption spectrum of the dried matter obtained in (1) as directed in the potassium bromide disk method under the Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 3435 cm^{-1} , 3345 cm^{-1} , 1290 cm^{-1} , 1229 cm^{-1} , 939 cm^{-1} and 872 cm^{-1} .

Purity Soluble halides—To a quantity of powdered Iopanoic Acid Tablets, equivalent to 2.5 g of Iopanoic Acid according to the labeled amount, add 20 mL of water and 2.5 mL of ammonia TS, and add 20 mL of dilute nitric acid and water to make 100 mL. Proceed as directed in the purity (1) under Iopanoic Acid.

Assay Weigh accurately not less than 20 Iopanoic Acid Tablets, and powder. Weigh accurately a portion of the powder, equivalent to about 0.4 g of iopanoic acid ($C_{11}H_{12}I_3NO_2$), add 20 mL of acetone, centrifuge after thorough shaking, and filter the supernatant liquid. Repeat 4 times the same procedures with each 10-mL portion of acetone in each case, filter through the same filter paper, combine the filtrates, and evaporate on a water bath to dryness. Cool, add 1 g of zinc powder and 10 mL of acetic acid (100) to the residue, and proceed as directed in the Assay under Iopanoic Acid.

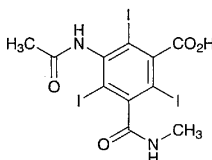
Each mL of 0.1 mol/L silver nitrate VS
= 19.031 mg of $C_{11}H_{12}I_3NO_2$

Containers and storage Containers—Tight containers.

Storage—Light-resistant.

Iotalamic Acid

イオタラム酸



$C_{11}H_9I_3N_2O_4$; 613.91

3-Acetylamino-2,4,6-triiodo-5-(methylaminocarbonyl)-benzoic acid [2276-90-6]

Iotalamic Acid, when dried, contains not less than

99.0% of $C_{11}H_9I_3N_2O_4$.

Description Iotalamic Acid occurs as a white powder. It is odorless.

It is sparingly soluble in ethanol (95), very slightly soluble in water, and practically insoluble in diethyl ether.

It dissolves in sodium hydroxide TS.

It gradually colored by light.

Identification (1) Heat 0.1 g of Iotalamic Acid over a flame: a purple gas is evolved.

(2) Determine the infrared spectrum of Iotalamic Acid, previously dried, as directed in the potassium bromide disk method under the Infrared Spectrophotometry, and compare the spectrum with the Reference Spectrum: both spectra exhibit similar intensities of absorption at the same wave numbers.

Purity (1) Clarity and color of solution—Dissolve 2.0 g of Iotalamic Acid in 10 mL of sodium hydroxide TS: the solution is clear and colorless.

(2) Primary aromatic amines—To 0.50 g of Iotalamic Acid add 15 mL of water, and dissolve it in 1 mL of sodium hydroxide TS while ice-cooling. Add 4 mL of a solution of sodium nitrite (1 in 100) to the solution, immediately add 12 mL of 1 mol/L hydrochloric acid TS, and shake gently. Then allow the mixture to stand for exactly 2 minutes, add 8 mL of ammonium amidosulfate TS, and shake occasionally for 5 minutes. Add 3 drops of a solution of 1-naphthol in ethanol (95) (1 in 10), allow to stand for 1 minute, add 3.5 mL of ammonia-ammonium chloride buffer solution, pH 10.7, mix, and immediately add water to make 50 mL. Determine within 20 minutes the absorbance of this solution at 485 nm as directed under the Ultraviolet-visible Spectrophotometry, using a solution, prepared in the same manner, as the blank: the absorbance is not more than 0.25.

(3) Soluble halides—Dissolve 0.5 g of Iotalamic Acid in 20 mL of diluted ammonia TS (1 in 40), add 6 mL of dilute nitric acid, shake, allow to stand for 5 minutes, and filter. Transfer the filtrate to a Nessler tube, wash the residue with 20 mL of water, combine the filtrate and the washings, and add water to make 50 mL. Proceed as directed for the Chloride Limit Test using this solution as the test solution. Prepare the control solution as follows: to 0.10 mL of 0.01 mol/L hydrochloric acid VS and add 20 mL of diluted ammonia TS (1 in 40), 6 mL of dilute nitric acid and water to make 50 mL.

(4) Iodine—Dissolve 0.20 g of Iotalamic Acid in 2.0 mL of sodium hydroxide TS, add 2.5 mL of 0.5 mol/L sulfuric acid TS, and allow to stand for 10 minutes with occasional shaking. Add 5 mL of chloroform, shake well, and allow to stand: the chloroform layer remains colorless.

(5) Heavy metals—Proceed with 1.0 g of Iotalamic Acid according to Method 2, and perform the test. Prepare the control solution with 2.0 mL of Standard Lead Solution (not more than 20 ppm).

(6) Arsenic—Prepare the test solution with 0.6 g of Iotalamic Acid according to Method 3, and perform the test using Apparatus B (not more than 3.3 ppm).

Loss on drying Not more than 0.5% (1 g, 105°C , 4 hours).

Residue on ignition Not more than 0.10% (1 g).

Assay Weigh accurately about 0.4 g of Iotalamic Acid, previously dried, place it in a saponification flask, dissolve