Acarbose Tablets

アカルボース錠

Acarbose Tablets contain not less than 95.0% and not more than 105.0% of the labeled amount of acarbose ($C_{25}H_{43}NO_{18}$: 645.60).

Method of preparation Prepare as directed under Tablets, with Acarbose.

Identification Perform the test with the sample solution and standard solution obtained in the Assay as directed under Thin-layer Chromatography <*2.03*>. Spot 2 μL each of the sample solution and standard solution on a plate of silica gel for thin-layer chromatography. Develop the plate with a mixture of 1-buthanol, ethanol (95) and water (9:7:4) to a distance of about 8 cm, and dry the plate at 105ºC for 15 minutes. Spray evenly thymol-sulfuric acid-methanol TS for spraying on the plate, and heat at 105ºC for 15 minutes: the spots obtained from the sample solution and standard solution show a red-purple color and the same *R*f value.

Purity Related substance－Perform the test with 10 μL of the sample solution obtained in the Assay as directed under Liquid Chromatography <*2.01*> according to the following conditions. Determine each peak area by the automatic integration method, and calculate the amount of them by the area percentage method: the amount of the related substance A having the relative retention time of about 0.9 to acarbose is not more than 2.0%, and the total amount of the peaks other than acarbose, the related substance D having the relative retention time of about 0.5 to acarbose, the related substance B having the relative retention time of about 0.8, the related substance C having the relative retention time of about 1.2, the related substance E having the relative retention time of about 1.7, the related substance F having the relative retention time of about 1.9 and the related substance G having the relative retention time of about 2.2 is not more than 3.0%. For the peak areas of the related substance D, B, E, F and G, multiply their relative response factors, 0.75, 0.63, 1.25, 1.25 and 1.25, respectively.

Operating conditions －

Detector, column, column temperature, mobile phase and flow rate: Proceed as directed in the operating conditions in the Assay.

Time span of measurement: About 2.5 times as long as the retention time of acarbose.

System suitability －

Test for required detectability: To 1 mL of the standard solution obtained in the Assay add water to make 100 mL, and use this solution as the solution for system suitability test. Pipet 5 mL of this solution, and add water to make exactly 50 mL. Confirm that the peak area of acarbose obtained with 10 μL of this solution is equivalent to 7 to 13% of that obtained with 10 μL of the solution for system suitability test.

System performance: When the procedure is run with 10 μL of the solution for system suitability test under the above operating conditions, the number of theoretical plates and the symmetry factor of the peak of acarbose are not less than 1500 and not more than 2.0, respectively.

System repeatability: When the test is repeated 6 times with 10 μL of the solution for system suitability test under the above operating conditions, the relative standard deviation of the peak area of acarbose is not more than 1.5%.

Uniformity of dosage unit <*6.02*> Perform the Mass variation test, or the Content uniformity test according to the following method: it meets the requirement.

To 1 tablet of Acarbose Tablets add exactly *V* mL of water so that each mL contains about 10 mg of acarbose ($C_{25}H_{43}NO_{18}$), shake thoroughly until the tablet is completely disintegrated, and centrifuge. Filter the supernatant liquid through a membrane filter with a pore size not exceeding 0.45 μm, discard the first 3 mL of the filtrate, and use the subsequent filtrate as the sample solution. Then, proceed as directed in the Assay.

Amount (mg) of acarbose ($C_{25}H_{43}NO_{18}$)
$= M_S \times A_T / A_S \times V / 10$

M_S: Amount (mg) of Acarbose RS taken, calculated on the anhydrous basis

Dissolution <*6.10*> When the test is performed at 75 revolutions per minute according to the Paddle method, using 900 mL of water as the dissolution medium, the dissolution rates in 15 minutes of 50-mg tablet and in 30 minutes of 100-mg tablet are not less than 85%, respectively.

Start the test with 1 tablet of Acarbose Tablets, withdraw not less than 20 mL of the medium at the specified minute after starting the test, and filter through a membrane filter with a pore size not exceeding 0.45 μm. Discard the first 10 mL of the filtrate, pipet *V* mL of the subsequent filtrate, add water to make exactly *V′* mL so that each mL contains about 56 μg of acarbose ($C_{25}H_{43}NO_{18}$), and use this solution as the sample solution. Separately, weigh accurately about 28 mg of Acarbose RS (separately determine the water <*2.48*> in the same manner as Acarbose), and dissolve in water to make exactly 100 mL. Pipet 5 mL of this solution, add water to make exactly 25 mL, and use this solution as the standard solution. Perform the test with exactly 50 μL each of the sample solution and standard solution as directed under Liquid Chromatography <*2.01*> according to the following conditions, and determine the peak areas, A_T and A_S, of acarbose in each solution.

Dissolution rate (%) with respect to the labeled amount of acarbose ($C_{25}H_{43}NO_{18}$)
$= M_S \times A_T / A_S \times V' / V \times 1 / C \times 180$

M_S: Amount (mg) of Acarbose RS taken, calculated on the anhydrous basis

C: Labeled amount (mg) of acarbose ($C_{25}H_{43}NO_{18}$) in 1 tablet

Operating conditions —

Detector: An ultraviolet absorption photometer (wavelength: 210 nm).

Column: A stainless steel column 4.6 mm in inside diameter and 15 cm in length, packed with octadecylsilanized silica gel for liquid chromatography (5 μm in particle diameter).

Column temperature: A constant temperature of about 40℃.

Mobile phase: Dissolve 0.60 g of potassium dihydrogenphosphate and 0.70 g of disodium hydrogenphosphate dodacahydrate in 1000 mL of water. To 950 mL of this solution add 50 mL of acetonitrile for liquid chromatography.

Flow rate: Adjust so that the retention time of acarbose is about 2 minutes.

System suitability —

System performance: When the procedure is run with 50 μL of the standard solution under the above operating conditions, the theoretical plates and the symmetry factor of the peak of acarbose are not less than 500 and not more than 2.5, respectively.

System repeatability: When the test is repeated 6 times with 50 μL of the standard solution under the above operating conditions, the relative standard deviation of the peak area of acarbose is not more than 2.0%.

Assay Weigh accurately the mass of not less than 20 Acarbose Tablets, and powder. Weigh accurately a portion of the powder, equivalent to about 0.1 g of acarbose ($C_{25}H_{43}NO_{18}$), add exactly 10 mL of water, shake for 10 minutes, and centrifuge. Filter the supernatant liquid through a membrane filter with a pore size not exceeding 0.45 μm, discard the first 3 mL of the filtrate, and use the subsequent filtrate as the sample solution. Separately, weigh accurately about 0.1 g of Acarbose RS (separately determine the water *<2.48>* in the same manner as Acarbose), dissolve in exactly 10 mL of water, and use this solution as the standard solution. Perform the test with exactly 10 μL each of the sample solution and standard solution as directed under Liquid Chromatography *<2.01>* according to the following conditions, and determine the peak areas, A_T and A_S, of acarbose in each solution.

$$\text{Amount (mg) of acarbose } (C_{25}H_{43}NO_{18}) = M_S \times A_T / A_S$$

M_S: Amount (mg) of Acarbose RS taken, calculated on the anhydrous basis

Operating conditions —

Detector: An ultraviolet absorption photometer (wavelength: 210 nm).

Column: A stainless steel column 4 mm in inside diameter and 25 cm in length, packed with aminopropylsilanized silica gel for liquid chromatography (5 μm in particle diameter).

Column temperature: A constant temperature of about 35°C.

Mobile phase: Dissolve 0.60 g of potassium dihydrogenphosphate and 0.70 g of disodium hydrogenphosphate dodacahydrate in 1000 mL of water. To 260 mL of this solution add 740 mL of acetonitrile for liquid chromatography.

Flow rate: Adjust so that the retention time of acarbose is about 16 minutes.

System suitability —

System performance: When the procedure is run with 10 μL of the standard solution under the above operating conditions, the theoretical plates and the symmetry factor of the peak of acarbose are not less than 1500 and not more than 2.0, respectively.

System repeatability: When the test is repeated 6 times with 10 μL of the standard solution under the above operating conditions, the relative standard deviation of the peak area of acarbose is not more than 1.5%.

Containers and storage Containers — Tight containers.

Others

Related substances A, B, C, D, E, F and G: Refer to them described in Acarbose.

Add the following to 9.01 Reference Standards (1):

Acarbose RS