

Valsartan and Hydrochlorothiazide Tablets

DEFINITION
Valsartan and Hydrochlorothiazide Tablets contain NLT 90.0% and NMT 110.0% of the labeled amounts of valsartan ($C_{24}H_{29}N_5O_3$) and hydrochlorothiazide ($C_7H_8ClN_3O_4S_2$).

IDENTIFICATION

- A. [THIN-LAYER CHROMATOGRAPHIC IDENTIFICATION TEST \(201\)](#).**
Sample solution: To an amount of ground Tablets, equivalent in weight to a single Tablet, add 2.0 mL of acetone, sonicate for 15 min, and centrifuge.
Application volume: 2 µL
Developing solvent system: Ethyl acetate, dehydrated alcohol, and 3.6 M of ammonium hydroxide (8:2:1)
Analysis: Proceed as directed in the chapter, except develop the plate in a paper-lined chromatographic chamber equilibrated with *Developing solvent system* for 15 min before use. Allow the chromatogram to develop until the solvent front has moved at least 7 cm. After removing the plate and marking the solvent front, dry the plate under a current of warm air.
Acceptance criteria: The R_f values of the principal spots from the *Sample solution* correspond to those from the *Standard solution*.
- B.** 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**
Diluent: Acetonitrile and water (1:1)
Solution A: Acetonitrile, water, and trifluoroacetic acid (10:90:0.1)
Solution B: Acetonitrile, water, and trifluoroacetic acid (90:10:0.1)
Mobile phase: See [Table 1](#).

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	90	10
25	10	90
27	90	10
40	90	10

Standard solution: Transfer 12.5 mg of [USP Hydrochlorothiazide RS](#) to a 200-mL volumetric flask, and add 12.5J mg of [USP Valsartan RS](#), J being the ratio of the labeled amount, in mg, of valsartan to the labeled amount, in mg, of hydrochlorothiazide per Tablet. Add 100 mL of *Diluent*, sonicate for 15 min, dilute with *Diluent* to volume, and mix. Transfer 25.0 mL of this solution to a 50-mL volumetric flask, dilute with *Diluent* to volume, and mix. Dilute with *Diluent* to obtain a solution having a concentration of 0.2 mg/mL of [USP Valsartan RS](#) in *Diluent*.

Sample stock solution: To the nominal equivalent of 62.5 mg of hydrochlorothiazide from a number of Tablets add 5 mL of water, and allow to stand for 5 min. Then add 100 mL of *Diluent*, sonicate for 15 min, and shake for 30 min. Dilute with *Diluent* to 250 mL, and centrifuge a portion of this solution at 3000 rpm. Dilute 25.0 mL of the clear supernatant with *Diluent* to 200.0 mL.

Sample solution: Nominally 0.2 mg/mL of valsartan from *Sample stock solution* in *Diluent*

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

Mode: LC**Detector:** UV 265 nm**Column:** 3.0-mm × 12.5-cm; 5-μm packing L1**Flow rate:** 0.4 mL/min**Injection volume:** 10 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 the labeled amounts of valsartan ($C_{24}H_{29}N_5O_3$) and hydrochlorothiazide ($C_7H_8ClN_3O_4S_2$) in the portion of Tablets 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 the appropriate USP Reference Standard in the *Standard solution* (mg/mL)

C_U = nominal concentration of the corresponding analyte in the *Sample solution* (mg/mL)

Acceptance criteria: 90.0%–110.0%**PERFORMANCE TESTS**• **[DISSOLUTION \(711\)](#)****Test 1****Medium:** pH 6.8 phosphate buffer; 1000 mL**Apparatus 2:** 50 rpm**Time:** 30 min

Determine the percentage of the labeled amounts of valsartan ($C_{24}H_{29}N_5O_3$) and hydrochlorothiazide ($C_7H_8ClN_3O_4S_2$) dissolved by using one of the following procedures.

Spectrophotometric procedure(See [Ultraviolet-Visible Spectroscopy \(857\)](#).)**Analytical wavelength:** 250 nm for valsartan and 272 nm for hydrochlorothiazide**Cell path length:** 0.2-cm quartz**Standard solution:** [USP Hydrochlorothiazide RS](#) and [USP Valsartan RS](#) in *Medium***Sample solution:** Pass a portion of the solution under test through a suitable glass fiber filter of 1-μm pore size. Dilute with *Medium*, if necessary, to a concentration similar to that of the *Standard solution*.**Analysis**

Calculate the percentage of the labeled amount of valsartan ($C_{24}H_{29}N_5O_3$) dissolved:

$$\text{Result} = [(AT_2 \times D) - (AT_1 \times E)/(C \times D) - (B \times E)] \times 12,500$$

Calculate the percentage of the labeled amount of hydrochlorothiazide ($C_7H_8ClN_3O_4S_2$) dissolved:

$$\text{Result} = [(AT_1 \times C) - (AT_2 \times B)/(D \times C) - (E \times B)] \times 80,000$$

AT_1 = absorbance of the *Sample solution* at 272 nm

C = $A1\%V_{250}$, absorptivity (1%, 0.2 cm, 250 nm) of valsartan in *Medium*

AT_2 = absorbance of the *Sample solution* at 250 nm

B = $A1\%V_{272}$, absorptivity (1%, 0.2 cm, 272 nm) of valsartan in *Medium*

D = $A1\%H_{272}$, absorptivity (1%, 0.2 cm, 272 nm) of hydrochlorothiazide in *Medium*