

# Analysis of Antianginal Drugs by HPLC

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Pharmaceutical

#### Abstract

Verapamil is used as a calcium antagonist in cases of hypertonia, cardiac disrythmia and angina pectoris. It also shows some prophylactic effects against migraine.

Figure 1 shows the chromatogram of verapamil using gradient analysis on a reversed phase column and UV detection. To avoid decomposition of samples the autosampler temperature was set to 4 °C.



The performance of the HPLC method is shown in the table on the next page.

Figure 1 Analysis of verapamil using a variable wavelength detector **Conditions** Column 4.6 x 75 mm Zorbax SB-C18, 3.5 µm Mobile phase A = 0.025 M KH<sub>2</sub>PO<sub>4</sub> in water  $(pH = 3 \text{ with } H_2 S O_4)$ B = acetonitrileFlow rate 1.0 ml/min Gradient 20 % B to 80 % B in 10 min Column wash 80 % B to 20 % B in 2 min UV detector variable wavelength detector: 204 nm. standard cell fluorescence detector: 228/312 nm, standard cell Column compartment temperature 25 °C Stop time 12 min Post time 5 min Injection volume 5 µl



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Compound	LOD for S/N=2 (mg/I)*	Precision of RT (RSD of 10 runs) (100 mg/l)*	Precision of Area (RSD of 10 runs) (100 mg/l)*	Linearity (Cor. factor) (0.01-100 mg/l)*
Verapamil	0.01	0.03	0.12	0.99992

\* Injection volume: 5 µl

The analysis can also be done using the Agilent 1100 Series fluorescence detector (figure 2).

The method presented here shows an easy but reliable and precise analysis of the antianginal drug verapamil. The values for LOD, precision of RT, precision of area and linearity show the good performance of the analysis.



#### Figure 2

Analysis of verapamil using a fluorescence detector (column: 2.1 x 50 mm Zorbax SB-C18, 5 µm)

### Note:

Since the method was specifically developed on the Agilent 1100 Series system you might not be able to reproduce this analysis on an older system or even on a new system with lower performance. To avoid sample decomposition it is necessary to use a cooled auto-sampler, for example, the Agilent 1100 Series thermostatted autosampler. The analysis can be performed with either an Agilent 1100 Series variable wavelength detector or an Agilent 1100 Series fluorescence detector.



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#### Equipment

#### Agilent 1100 Series

- Quaternary pump (includes vacuum degasser)
- Thermostatted autosampler
- Thermostatted column
  compartment
- Variable wavelength detector, standard flow cell, 10-mm path length, 13-µl cell volume

### Alternative:

- Vacuum degasser
- Binary pump
- Diode-array detector, standard flow cell 10-mm path length, 13-µl cell volume
- Agilent ChemStation
  + 3D software

## Columns

- Zorbax SB-C18, 3.5 µm,
  4.6 x 75 mm (Agilent part number 866953-902)
- Recommended: Guard cartridges Zorbax SB-C18, 5 μm, 4.6 x 12.5 mm (Agilent part number 820950-920, 4/pk)

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