HPLC-UV Method for the Determination of Asenapine Maleate Impurities Using a Solid Core C8 Column

Prakash Chander and Tushar N. Mehta, Centre of Excellence for Asia Pacific Laboratory
Thermo Fisher Scientific, Ahmedabad, India

Key Words
Asenapine maleate, impurity analysis, Accucore C8 column, Core Enhanced Technology, solid core

Abstract
This application note demonstrates the use of the Thermo Scientific™ Accucore™ C8 column for the determination of asenapine maleate impurities by HPLC-UV.

Introduction
Asenapine maleate (Figure 1) is a novel drug recently approved by the United States Food and Drug Administration for treatment of acute schizophrenia and for manic or mixed episodes of bipolar I disorder, with or without psychotic features, in adults. This application note demonstrates a simple and rapid method for the determination of asenapine maleate impurities using an Accucore C8 HPLC column.

Accucore HPLC columns use Core Enhanced Technology™ to facilitate fast and highly efficient separations. The 2.6 µm diameter particles are not totally porous, but instead have a solid core and a porous outer layer. The optimized phase bonding creates a series of high coverage, robust phases. Accucore C8 HPLC columns offer lower hydrophobic retention than columns packed with longer alkyl chain length material, such as C18. The low levels of secondary interactions demonstrated by the phase are the result of excellent bonded phase coverage and allow users of Accucore C8 HPLC columns to benefit from excellent peak shapes. The tightly controlled 2.6 µm diameter of Accucore particles results in much lower backpressures than typically seen with sub-2 µm materials.

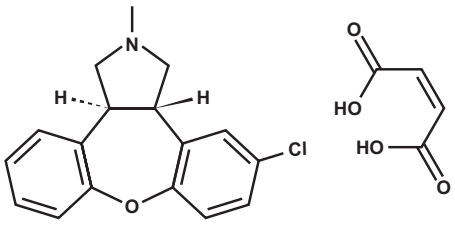

Figure 1: Asenapine maleate

Experimental Details

Consumables	Part Number
Fisher Scientific™ Optima™ LC/MS grade acetonitrile	A/0626/17
Triethyl amine (HPLC grade)	
Orthophosphoric acid (HPLC grade)	
Dipotasium hydrogen phosphate (HPLC grade)	
Water, from a water purification system	
Asenapine maleate system suitability solution, provided by the customer	

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Vials and Closures	Part Number
Thermo Scientific borosilicate glass vials (2 mL, 12 mm × 32 mm) with 8 mm black screw cap fitted with a silicone/PTFE seal	60180-600

Separation Conditions		Part Number
Instrumentation:	Thermo Scientific™ Dionex™ UltiMate™ 3000 LC system	
Column:	Accucore C8 2.6 µm 150 mm × 3.0 mm	17226-153030
Buffer:	Weigh accurately 3.48 g of dipotassium hydrogen orthophosphate into 1000 mL of water and then add 0.5 mL of triethylamine, adjust pH 6.7 with orthophosphoric acid	
Mobile phase A:	Buffer	
Mobile phase B:	Acetonitrile / water (90:10 v/v)	
Isocratic:	40% B	
Flow rate:	0.7 mL/min	
Column temperature:	40 °C	
Autosampler temperature:	10 °C	
UV detector wavelength:	220 nm	
Injection details:	2.5 µL partial loop	
Run time:	20 minutes	
Backpressure:	Approximately 250 bar	

Data Processing
Data were acquired and processed using Thermo Scientific™ Chromeleon™ 7 Chromatography Data System

Results

The analysis was performed on an Accucore C8 2.6 µm, 150 mm × 3.0 mm column. As shown in Figure 2, asenapine maleate and impurities were analyzed in less than 20 minutes. The results are summarized in Table 1.

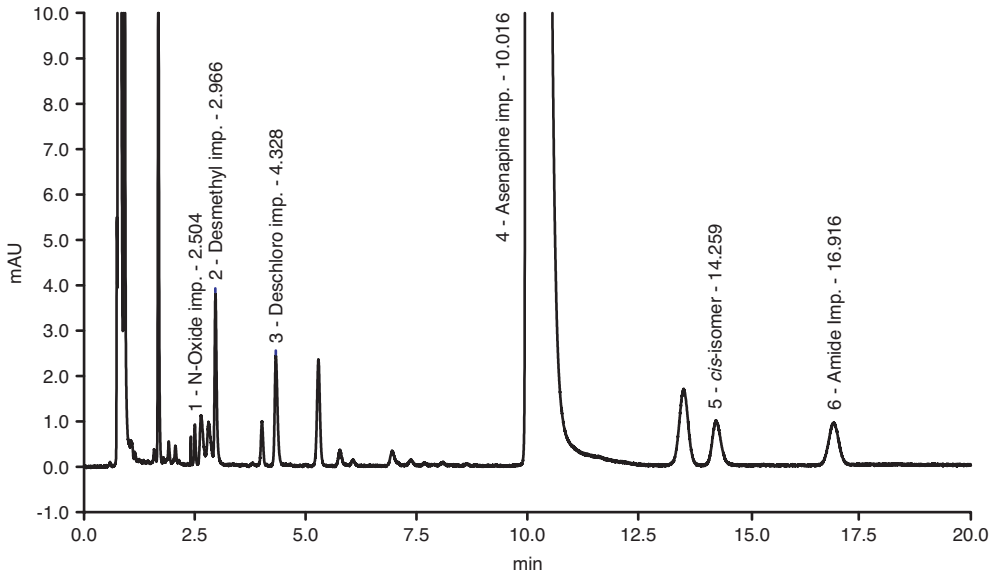

Figure 2: Chromatogram of asenapine maleate and its related impurities

Compound	Retention time (min)
Asenapine	10.016
***cis*-isomer**	14.259
Desmethyl impurity	2.966
Deschloro impurity	4.328
N-Oxide impurity	2.504
Amide impurity	16.916

Table 1: Retention time for asenapine maleate and impurities

Conclusion

Asenapine and its impurities are easily separated using an Accucore C8 HPLC column, which provides excellent resolution (Rs>12) between asenapine and its *cis*-isomer impurity. This demonstrates that the Accucore C8 column is an excellent choice of column for the rapid analysis of asenapine maleate-related substances.

References

T.R.Parthasarathi, et al. Quantitative Determination of Asenapine Maleate Using Reverse Phase-High Performance Liquid Chromatography. **2012** Oct, Int. J. Pharm. Bio. Sci. *3*(4), 360-366.

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USA and Canada +1 800 332 3331
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China +86 21 68654588 +86 10 84193588
+86 20 83145199 800 810 5118
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Australia 1 300 735 292 (free call domestic)
New Zealand 0800 933 966 (free call domestic)
All Other Enquiries +44 (0) 1928 534 050

Technical Support
North America +1 800 332 3331
Outside North America +44 (0) 1928 534 440

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