APPLICATION BRIEF

Liquid Chromatography

HPLC Analysis of Vitamin C Using Quasar Biphenyl Column

Introduction

Vitamin C, also known as ascorbic acid and L-ascorbic acid, is a water soluble vitamin found in various foods including peppers, kiwifruit, oranges and kale. It is regarded as an essential nutrient to prevent scurvy, involved in the repair of tissue and also thought to lower cancer risk.[1] It is required for the functioning of several enzymes and is important for immune system function. Since it's isolation in 1928 it was the first vitamin to be commercially produced. Today it is widely available as a dietary supplement.[2] This application brief describes use of a Quasar biphenyl column in the analysis of vitamin C, Figure 1.

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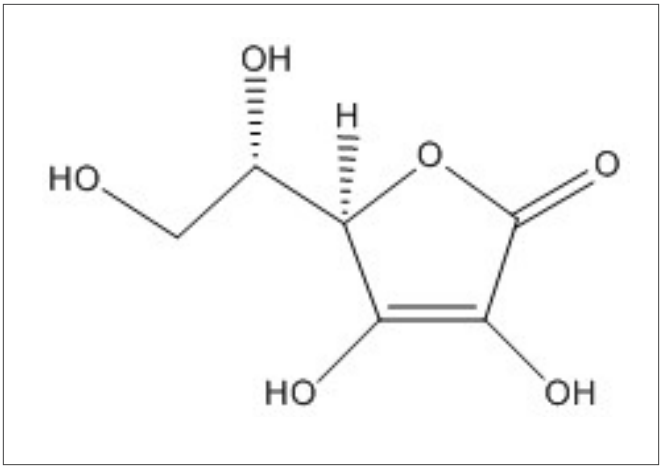

Figure 1. Chemical structure of Vitamin C.

Experimental Conditions

Method Parameters

All HPLC method parameters are shown in Table 1.

Table 1. HPLC Method Parameters.

Quasar Biphenyl	150 mm	4.6 mm	5 µm	N9308861
Mobile Phase	H_20, 0.1 % formic acid			
Flow Rate	0.8 mL/min			
Temp	25 °C			
Wavelength	254 nm			
Analyte	Vitamin C			

Solvents and Samples

All solvents were HPLC grade and samples were filtered using a 0.45 µm nylon filter, P/N 02542880.

Results and Discussion

Vitamin C, Figure 1, is successfully analysed in just over 4 minutes using the Quasar biphenyl column used, 150 mm in length, Figure 2. Ideally suited to the analysis of small molecules, such as this naturally occurring water soluble vitamin, the Quasar biphenyl phase provides optimal retention via ligand/analyte interactions, whilst also maintaining peak shape due to the ultra-high purity silica base and low residual silanol activity.

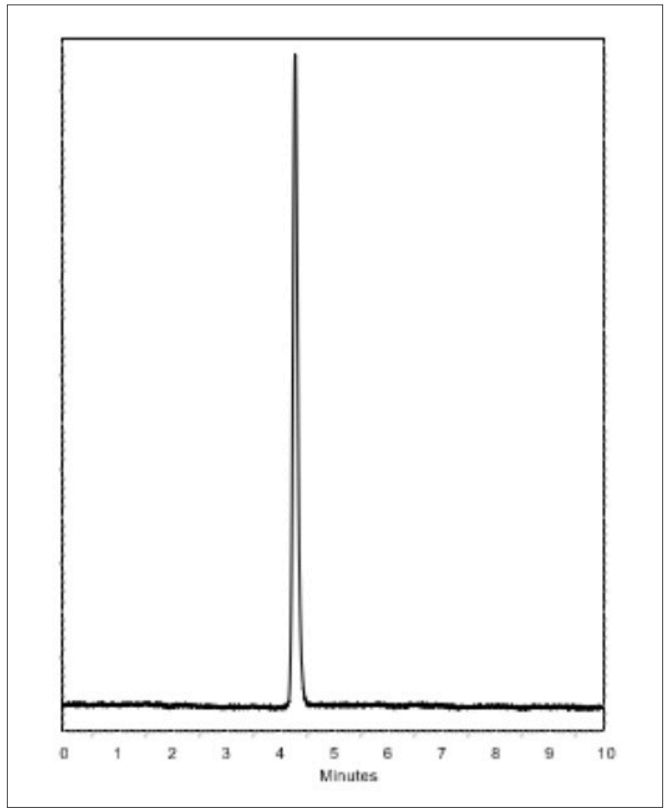

Figure 2. HPLC analysis of vitamin C using Quasar biphenyl column, 150 x 4.6 mm, 5 µm.

Conclusion

- The Quasar biphenyl HPLC phase offers high efficiency separation of this natural compound, vitamin C.
- The ultra-high purity silica base and low residual silanol activity yields excellent peak shape even for this polar analyte.
- Run time could be further reduced by using a shorter Quasar biphenyl column packed with 3 µm or 1.7 µm particles.

References

1. "Vitamin C." Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: The National Academies Press. 2000. pp. 95–185. ISBN 978-0-309-06935-9. Archived from the original on September 2, 2017. Retrieved September 1, 2017.
2. "Ascorbic Acid." The American Society of Health-System Pharmacists. Archived from the original on December 30, 2016. Retrieved December 8, 2016.

Consumables

Phase	Length (mm)	I.D. (mm)	µm	Part
Quasar BiPhenyl	300	3.9	5	N9308859
Quasar BiPhenyl	250	4.6	5	N9308860
Quasar BiPhenyl	150	4.6	5	N9308861
Quasar BiPhenyl	100	4.6	5	N9308862
Quasar BiPhenyl	50	4.6	5	N9308863
Quasar BiPhenyl	150	4.6	3	N9308864
Quasar BiPhenyl	100	4.6	3	N9308865
Quasar BiPhenyl	50	4.6	3	N9308866
Quasar BiPhenyl	150	3.0	3	N9308867
Quasar BiPhenyl	100	3.0	3	N9308868
Quasar BiPhenyl	50	3.0	3	N9308869
Quasar BiPhenyl	150	2.1	3	N9308870
Quasar BiPhenyl	100	2.1	3	N9308871
Quasar BiPhenyl	50	2.1	3	N9308872
Quasar BiPhenyl	100	4.6	1.7	N9308873
Quasar BiPhenyl	50	4.6	1.7	N9308874
Quasar BiPhenyl	100	3.0	1.7	N9308875
Quasar BiPhenyl	50	3.0	1.7	N9308876
Quasar BiPhenyl	100	2.1	1.7	N9308877
Quasar BiPhenyl	50	2.1	1.7	N9308878
Quasar Biphenyl Guard Cartridge (3/pack)	10	3	5	N9304490
Quasar Biphenyl Guard Cartridge (3/pack)	10	3	3	N9304491
Quasar Guard Cartridge Holder	-	-	-	N9306876

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