Separation of Benzimidazoles and Derivatives in Anti-parasitic Drugs

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Technical Bulletin # 340

This multicomponent analysis of anti-parasitic drugs achieves baseline resolution of six closely related compounds in under 20 minutes using gradient elution and the unique selectivity of ZirChrom®-PBD.

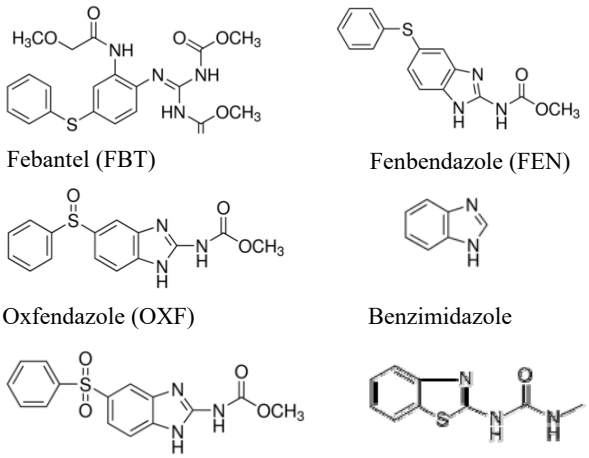

Figure 1: Structures of febantel, fenbendazole, oxfendazole, benzimidazole, oxfendazole sulfone, and benzthiazuron.

Introduction

Benzimidazoles are a large class of pharmaceuticals used in animal production with a broad spectrum of activity against roundworms (nematodes).[1] The longer half-life of oxfendazole and fenbendazole, due to their slow metabolization, allows these compounds to be more effective but also raises the concern of residues in the final food products. Here we present a gradient method of six closely related anti-parasitic pharmaceuticals.

Experimental

A mixture of six anti-parasitic pharmaceuticals was separated at 30 ºC using a ZirChrom®-PBD column. Samples were 1 mg/mL and were in acetonitrile with the exception of benzthiazuron which was in methanol. The separation conditions were as follows:

Column: ZirChrom®-PBD, size 150 mm x 4.6 mm i.d. (Part Number: ZR03-1546)

Mobile Phase: A: 15mM Ammonium Formate, pH 7.6
B: Acetonitrile

Time (min.)	% A	% B
0	96	4
8	96	4
20	80	20
25	96	4

Temperature: 30 ºC
Flow Rate: 1 ml/min.
Injection Vol.: 5 µl
Pressure Drop: 195 bar
Detection: UV at 254 nm

In Figure 2 the superior multi-modal selectivity of ZirChrom®-PBD for these compounds is demonstrated. All six components are resolved. The additional peaks at approximately 13 and 20 minutes are believed to be artifacts from the gradient.

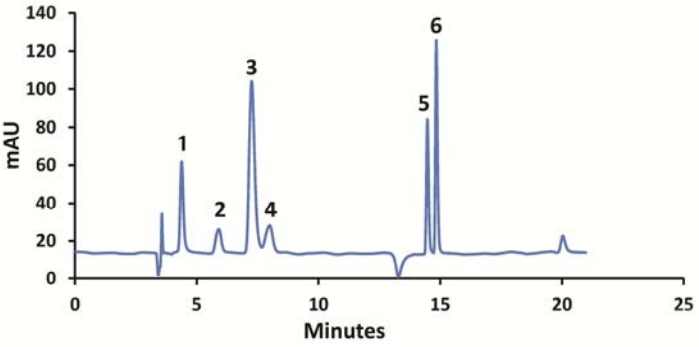

Figure 2: 1=Benzimidazole, 2=Oxfendazole, 3=Benzthiazuron , 4=Oxfendazole Sulfone, 5=Fenbendazole, 6=Fenbentel

This method can be tailored to your specific application needs. ZirChrom technical support can help to optimize and transfer this method to your site. Please contact ZirChrom technical support at 1-866-STABLE-1 or support@zirchrom.com for details.

ZirChrom phases offer unique selectivity, high efficiency, and excellent chemical and thermal stability.

References

(1)http://www.merckvetmanual.com/mvm/pharmacology/anthelmintics/benzimidazoles.html

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