

# LC/MS Compatible Separation of Non-Steroidal Anti-Inflammatory Drugs

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ZirChrom®

## Technical Bulletin #285

The Lewis acidity of zirconia-based supports for HPLC has historically presented problems in the analysis of analytes containing Lewis base moieties, such as carboxylates, particularly in LC/MS applications where volatile mobile phase additives are required. In this application note we demonstrate the utility of a new Lewis acid deactivated zirconia-based column, ZirChrom®-EZ.

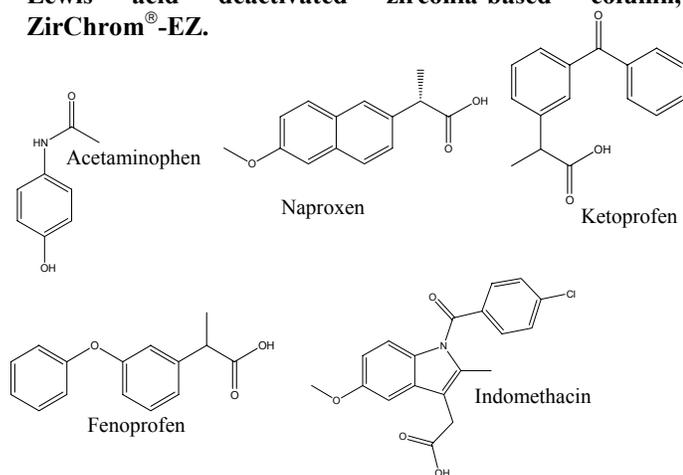


Figure 1: Structures of Non-steroidal anti-inflammatory drugs.

### Introduction

Historically, the Lewis base carboxylic acid moiety on non-steroidal anti-inflammatory drugs required the use of a Lewis base mobile phase additive of a higher strength in the elutropic series (such as phosphate or fluoride) (1). While these types of additives work well in applications with UV/Vis detection, their use is almost entirely prohibited in LC/MS applications due to their relatively low volatility.

The deactivation of Lewis acid sites on the surface of the ZirChrom®-EZ particle allows the chromatography of Lewis base analytes using mobile phase additives of the users choice including conventional LC/MS compatible buffers (such as acetate and formate) throughout the pH range of 1-10.

### Experimental

Five non-steroidal anti-inflammatory drugs were separated at 35°C using a ZirChrom®-EZ column. The separation conditions were as follows:

Column: ZirChrom®-EZ, 150 mm x 4.6 mm i.d.  
(Part Number: EZ01-1546)

Mobile Phase: A: acetonitrile  
B: 20 mM ammonium acetate, pH 5.0

Time	%A	%B
0	10	90
10	90	10

Temperature: 35 °C with Metalox™ 200-C Column Heater  
Flow Rate: 1.0 ml/min.  
Injection Vol.: 10 µl  
Pressure Drop: 168 bar  
Detection: UV at 254 nm

Five non-steroidal anti-inflammatory drugs were separated using simple acetonitrile/water gradient elution and a LC/MS friendly acetate buffer.

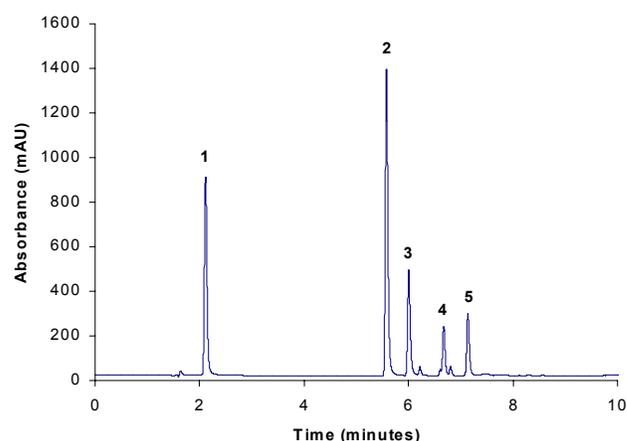


Figure 2: Separation of 1=Acetaminophen, 2=Naproxen, 3=Ketoprofen, 4=Fenoprofen, and 5=Indomethacin.

This method can be tailored to your specific application needs. ZirChrom method developers 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](mailto:support@zirchrom.com) for details.

### References

- (1) Blackwell, J. A.; Carr, P. W. *Journal of Liquid Chromatography* **1991**, *14*, 2875-2889.

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