

FLARE C18 Mixed-Mode Column: Alkaloids

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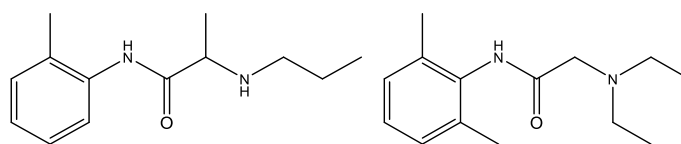
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Introduction

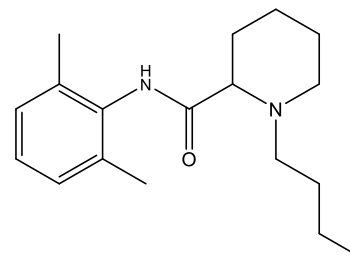
The alkaloids are a class of basic, naturally occurring, amine-containing compounds.[1] They are commonly used as local anesthetics and stimulants in clinical practice. For basic analyte analysis using a reversed phase HPLC column, higher pH conditions are desirable because the analytes will be neutral and therefore better retained and separated.[2]

The FLARE C18 mixed-mode (MM) column is a non-silica HPLC column made from carbon, polymer and nanodiamond.[3] These materials are well known for their stability under elevated pH and temperature conditions.[3, 4] In addition to its stability, the FLARE column also has mixed-mode



1. Prilocaine

2. Lidocaine



3. Bupivacaine

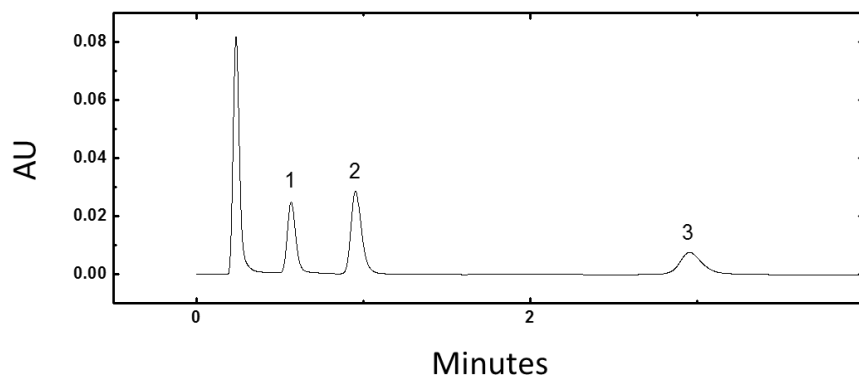


Figure 1. Chromatogram of (1) prilocaine, (2) lidocaine, and (3) bupivacaine separated at pH 12.

properties.[5] With this column, lower pH values often favor the separation of acidic analytes, and higher pH values the separation of basic analytes. This is because the column contains amines in its stationary phase. At lower pH, the stationary phase is positively charged, which allows interactions with acidic analytes through ionic interactions. At higher pH, both basic analytes and the stationary phase are in their neutral forms and interact with each other through hydrophobic interactions.

In this application note, three alkaloids (prilocain, lidocaine, and bupivacaine) are separated at pH 12 using the FLARE C18 Mixed-Mode (MM) column.

Experimental

HPLC system: Waters HPLC 1525 binary pump with dual wavelength UV detector (Model No. 2487)

Column: FLARE C18MM 4.6 x 33 mm (cat # FL36-46033)

Injection volume: 5.0 μ L

Flow rate: 1.5 mL/min

Elution conditions: Isocratic

Detection: UV at 254 nm

Temperature: 35 °C

Mobile phases: 10 mM phosphate buffer at pH 12, ACN (75:25)

References

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- [2] Kirkland J. J., henderson J. W., DeStefano J. J., van Straten M. A., Claessens H. A. Stability of Silica-Based, Endcapped Columns with pH 7 and 11 Mobile Phases for Reversed-Phase High-Performance Liquid Chromatography. *Journal of Chromatography A*. 1997;762:97-112.
- [3] Hung C-H., Wiest L. A., Singh B., Diwan A., Valentim M. J. C., Christensen J. M., et al. Improved Efficiency of Reversed-Phase Carbon/Nanodiamond/Polymer Core-Shell Particles for HPLC Using Carbonized Poly(divinylbenzene) Microspheres as the Core Materials. *Journal of Separation Science*. 2013;36(24):3821-9.
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- [5] Wiest L. A., Jensen D. S., Hung C-H., Olsen R. E., Davis R. C., Vail M. A., et al. Pellicular Particles with Spherical Carbon Cores and Porous Nanodiamond/Polymer Shells for Reversed-Phase HPLC. *Analytical Chemistry*. 2011;83(14):5488-501.