Waters

SunFire™ C_8: A Unique RPLC Stationary Phase for Best Peak Shapes

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The new SunFire™ C_8 column is a reversed-phased (RP) HPLC column designed for the best peak shape, excellent efficiency, high-preparative mass loading, and superior stability under low-pH conditions.

HPLC columns with alkyl chains (e.g. C_{18} and C_8) are the most popular columns used in a variety of industries. For a given RPLC substrate with a given bonding technology, the retention increases with increasing alkyl chain length due to higher hydrophobic interactions. The advantages of using shorter chain length ligands include decreased total run time, improved peak tailing, and predictable selectivity for easy methodology transfer. The SunFire™ C_8 columns are engineered with highly pure raw materials and a tightly controlled synthesis process. This column provides high efficiencies and symmetric peak shapes for the analysis of acids, neutrals, and bases. The columns also exhibit superior lifetimes under low-pH conditions.

Experimental Conditions

Figure 1

Columns: SunFire™ C_8 4.6 × 150 mm, 5 µm and SunFire™ C_{18} 4.6 × 150 mm, 5 µm
Flow Rate: 1.0 mL/min
Isocratic: 55:35:10 (water: acetonitrile: 2% acetic acid)
Injection Volume: 10 µL
Sample: Oxazepam, lorazepam, desmethyldiazepam, temazepam, and diazepam at concentration of 10 µg/mL each in water
Detection: UV at 254 nm
Instrument: Alliance® 2695 with 2996 PDA

Figure 2

Columns: SunFire™ C_8, Luna® C_8 (2), Ace® 5 C_8, all columns are 3.0 × 50 mm, 5 µm
Mobile Phase: 1% TFA in water
Injection Volume: 5 µL
Sample: Ethylparaben at concentration of 0.64 mg/mL

Results:

The separation of five central nervous system (CNS) depressants on the analytical SunFire™ C_8 and SunFire™ C_{18} columns are shown in Figure 1. As noted, total run time has decreased from 24 min on a C_{18} column to 16 min on the C_8 column. Furthermore, better peak shapes were observed on the C_8 column.

Figure 2 is the SunFire™ C_8 column lifetime study under accelerated low-pH stability conditions. SunFire™ C_8 columns have improved low-pH stability compared to leading silica-based C_8 columns due to the unique bonding and end-capping technology.

Conclusions:

Faster separations, improved peak shape, and superior stability under low-pH conditions are observed with SunFire™ C_8 columns.

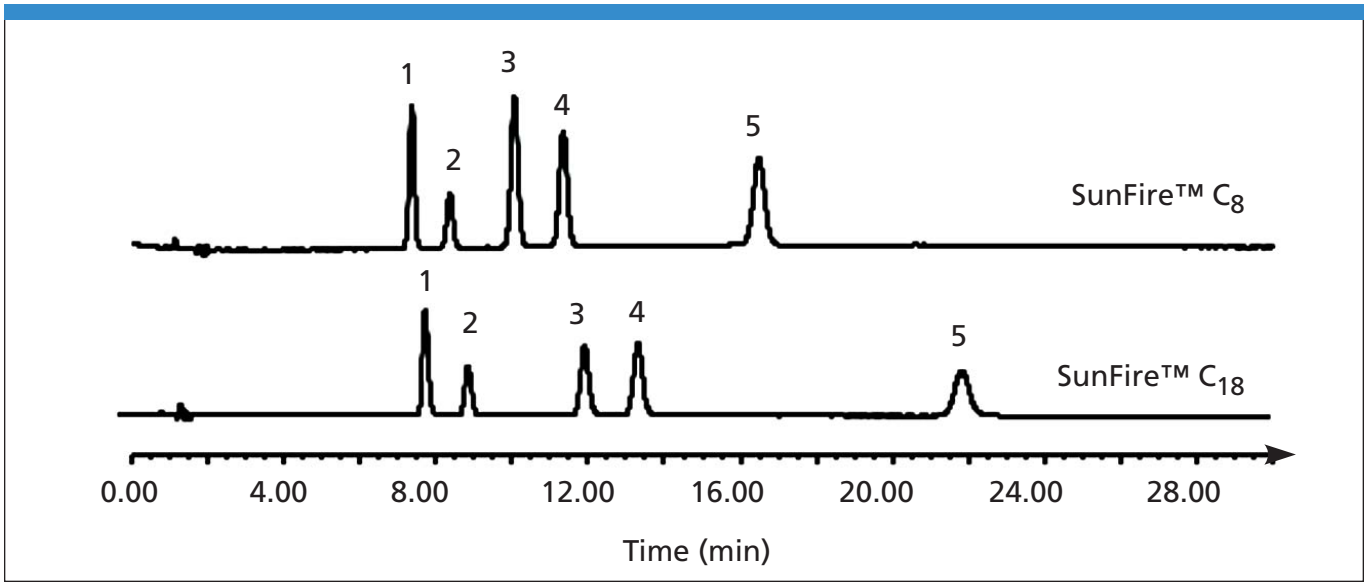

Figure 1: Separation of the central nervous system (CNS) depressants on the analytical SunFire™ C_8 and SunFire™ C_{18} columns. Column dimensions: 4.6 × 150 mm, 5 µm Analytes: (1) oxazepam, (2) lorazepam, (3) desmethyldiazepam, (4) temazepam , and (5) diazepam.

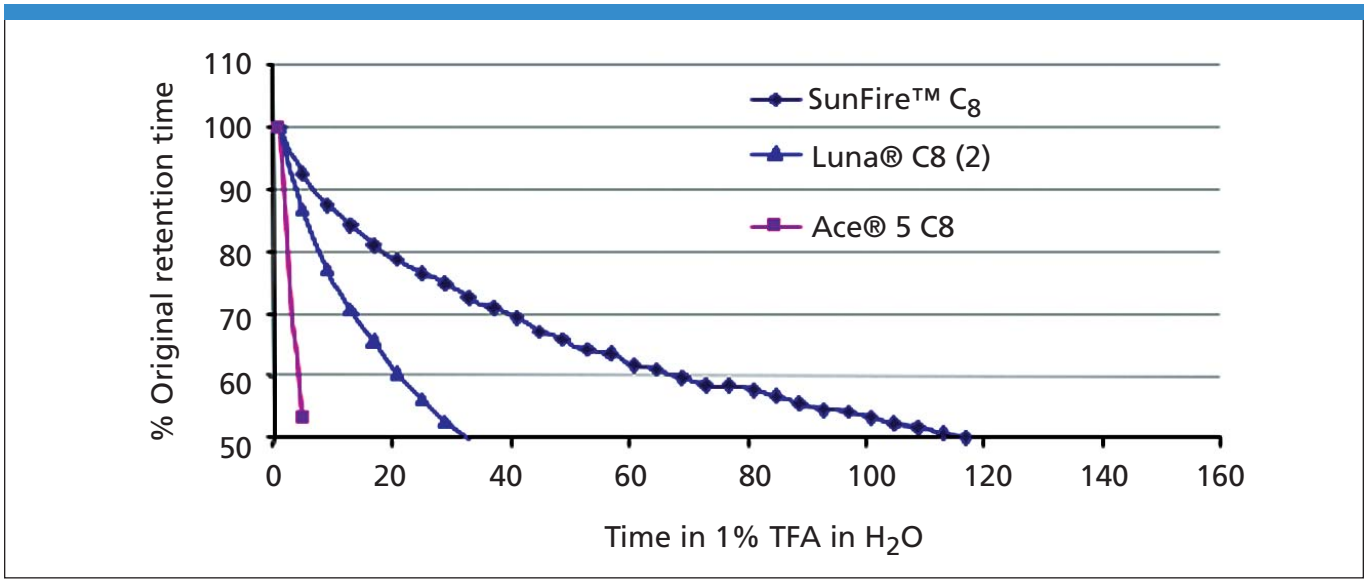

Figure 2: Column stability study under accelerated low-pH test. Mobile phase: 1% TFA in water. Analyte: ethylparaben.

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