The new reversed-phased SunFire™ C₁₈ column possesses high preparative mass loading and excellent efficiency for challenge separations under low pH conditions.

Structurally-related analytes are challenging to purify efficiently and are difficult to separate due to selectivity and loadability limitations. The use of pH range to impact the selectivity of ionizable compounds is a very powerful approach. As has been shown previously, purification of compounds in the non-ionized form can achieve 20–50 folds or even higher loadability compared to the ionic form (1). However, due to procedure or equipment limitations, it is often the case that it is only practical to work in a specific pH. The SunFire™ C₁₈ preparative OBD™ columns are designed to have reduced peak tailing, high loadability, and extraordinary low pH stability. Therefore, in this study, we compare the preparative loading of basic compounds on SunFire™ Prep columns at low pH and XTerra® Prep columns at high pH conditions.

**Experimental Conditions**

**Low pH Conditions:**
- Column: SunFire™ Prep C₁₈, 19 × 100 mm, 5 μm
- Mobile phase A: 0.1% trifluoroacetic acid in water
- Mobile phase B: 0.1% trifluoroacetic acid in acetonitrile
- Flow rate: 18.0 mL/min (Figure 1), 23.9 mL/min (Figure 2)
- Gradient: 10 min linear from 10% to 90% B and hold at 90%B for 5 min (Figure 1); 10 min linear from 45% to 90% B (Figure 2)
- Injection volume: 3000 μL (Figure 1) and 848 μL (Figure 2)
- Sample in Figure 1: econazole and miconazole at 10 mg/mL each in DMSO
- Sample in Figure 2: nitrendipine and nimodipine at 25 mg/mL each in DMSO
- Detection: UV at 270 nm (Figure 1); UV at 290 nm (Figure 2)
- Instrument: Waters®, AutoPurification™ system

**High pH Conditions:**
- Column: XTerra® Prep MS C₁₈, 19 × 100 mm, 5 μm
- Mobile phase A: 100 mM NH₄HCO₃/water (10/90), pH 10
- Mobile phase B: 100 mM NH₄HCO₃/acetonitrile (10/90), pH 10
- Flow rate: 18.0 mL/min (Figure 1), 23.9 mL/min (Figure 2)
- Gradient: 10 min linear from 0% to 100% B, and hold at 100% B for 5 min (Figure 1); 10 min linear from 50% to 100% B (Figure 2)
- Injection volume: 4000 μL (Figure 1) and 1020 μL (Figure 2)

**Results**

The separations of two structurally related antifungal drugs under low- and high-pH conditions are shown in Figure 1. A total load of 60 mg is achieved on a SunFire™ Prep column at pH 2.3 (as indicated in 1a), while 80 mg is achieved on a XTerra® Prep column at pH 10 (Figure 1b). Similarly, the separations of two calcium blockers on the SunFire™ Prep and XTerra® Prep columns are shown in Figure 2. A comparable mass loading is achieved on SunFire™ Prep column at low pH and the XTerra® Prep column at high pH.

Depending on the conditions required, you have the option of using SunFire™ for low pH, or XTerra® for high pH conditions to separate and purify basic analytes.

**Conclusions**

New SunFire™ Prep columns provide comparable high mass loading for basic compounds under low pH to XTerra® Prep columns under high pH.

**References**


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