

Performance Comparison – Biotage® Sfär Silica HC Duo vs. Biotage® SNAP Ultra on Isolera™ Part 2



For flash purification, Biotage® Sfär Silica High Capacity Duo replaces the older Biotage® SNAP Ultra product line. The Sfär columns offer significant advantages over the SNAP Ultra range:

- » New 5 g and 200 g columns
- » All spherical 20 µm media
- » Increased pressure rating
- » CE marked
- » Fast pressure-driven equilibration when used with the Biotage® Selekt system, giving huge solvent savings
- » New improved packaging
- » Clearer labels and QR code when used with the Selekt system

The majority of these advantages are new features that can be of benefit regardless of which flash purification instrument is used to run the column. However, the main performance advantage of increased pressure capability (and associated higher flow equilibration) requires the use of the Selekt flash purification system. So are there any performance advantages of the new columns that are of benefit to Isolera users?

To investigate this, the separation of three nitro-compounds was investigated on the Biotage® Sfär Silica High Capacity Duo 10 and 50 g columns, and equivalent SNAP Ultra columns on the Isolera™ system.

Chromatography Conditions

Sample Solution

- » 1-Nitronaphthalene 10.0 g
- » 2-Nitroaniline 10.0 g
- » 3-Nitroaniline 10.0 g
- » Acetone, pa 50 mL

4.0 mL sample was concentrated on rotavapor and the remains were dried under vacuum for 1 hour.

m= 2.00 g gives a concentration of 0.50 g/mL

Chromatography Gradient

- » A: n-Heptane, B: Ethyl acetate
- » Cartridge Equilibration, SNAP Ultra: 10%B 3 CV
- » Cartridge Equilibration, Sfär Silica: 10%B 3 CV
- » Gradient run: 10%B 1 CV, 10–40%B 8 CV, 40 %B 1 CV
- » 254 nm (Monitor), 370 nm (Monitor), λ-All (Collect), Baseline Correction: ON, TH: 100 mAU
- » Flow-rate SNAP Ultra, 10 g: 36 mL/min.
- » Flow-rate SNAP Ultra, 50 g: 100 mL/min.
- » Flow-rate Sfär Silica HC D, 10 g: 40 mL/min.
- » Flow-rate Sfär Silica HC D, 50 g: 120 mL/min.
- » Isolera One, Spektra 200–400 nm, sw 3.3.0

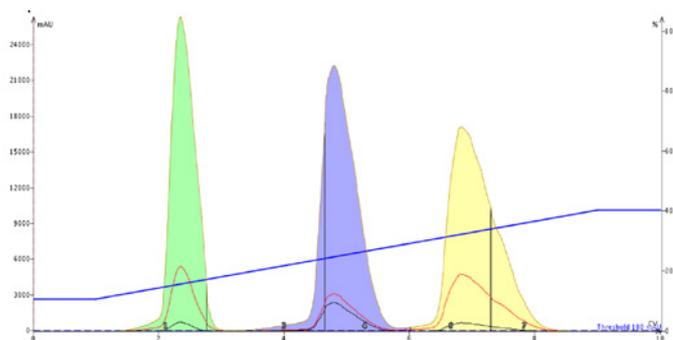


Figure 1. The three compounds run on a Biotage® SNAP Ultra, 10 g with 2.5% loading, just as baseline separation is lost.

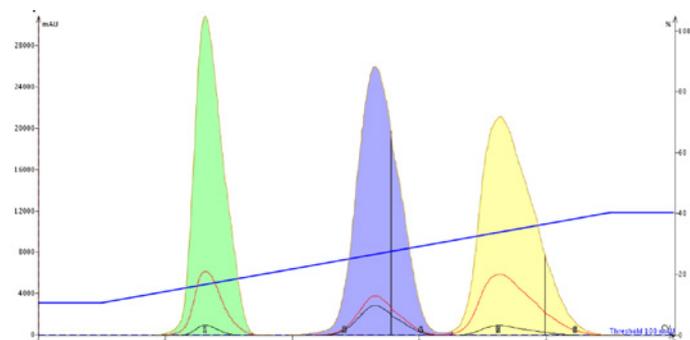


Figure 2. The three compounds run on a Biotage® Sfär Silica HC D, 10 g with 3.1% loading, just as baseline separation is lost.

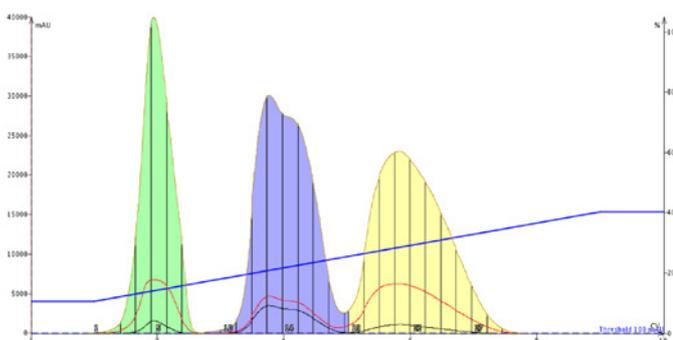


Figure 3. The three compounds run on a Biotage® SNAP Ultra, 50 g with 6.2% overloading, showing the separation between the two close peaks.

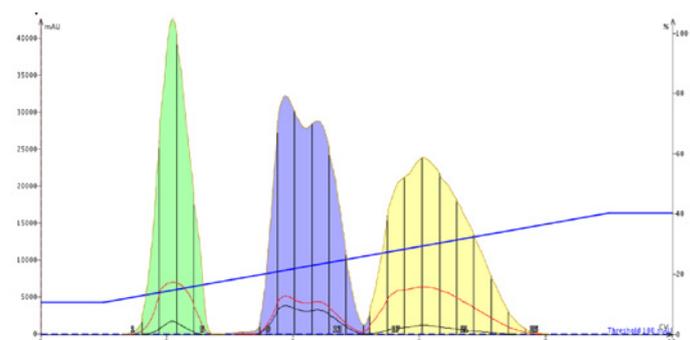


Figure 4. The three compounds run on a Biotage® Sfär Silica HC D, 50 g with 6.2% overloading, showing the separation between the two close peaks.

Chromtogram	Cartridge type	Sample volume	Sample mass	Loading (%)
Figure 1	Biotage® SNAP Ultra, 10 g	0.50 mL	0.25 g	2.5
Figure 2	Biotage® Sfär Silica HC D, 10 g	0.60 mL	0.31 g	3.1
Figure 3	Biotage® SNAP Ultra, 50 g	6.2 mL	3.1 g	6.2*
Figure 4	Biotage® Sfär Silica HC D, 50 g	6.2 mL	3.1 g	6.2*

Table 1. Results of the experiment

During the experiment, the loading was increased on the columns until a loss of baseline separation between the three samples was beginning to be observed. These results are shown in Figures 1 and 2. The loading on each column was then doubled to investigate how the separation looked when the columns were overloaded, and the result are shown in Figures 3 and 4. The results are also summarized along in Table 1.

Conclusions

The separation of an 3-component Nitroaniline sample was optimized on Isolera™ One using a Biotage® SNAP Ultra 10 g cartridge, and the maximum loading was, maintaining baseline separation, shown to be 2.5% (0.25 g) material. When same sample was applied on a 10 g Biotage® Sfär Silica HC D cartridge on Isolera, the loading could be increased to 3.1% (0.31 g)

even though the flowrate is 40 mL/min on 10 g Sfär Silica HC D cartridge compared to 36 mL/min running a 10 g SNAP Ultra. In the case of this sample the Sfär Silica HC D cartridge gave a 25% increase in loading compared to an equivalent 10 g SNAP Ultra cartridge.

Doubling the loading obtained on the Sfär Silica HC D to 6.2% (thus overloading the cartridge) on both 50 g SNAP Ultra cartridge and Sfär Silica HC D cartridge on Isolera, it was observed that the Sfär Silica HC D cartridge again gave an improved separation as the resolution between the two peaks was closer to baseline.

This study shows that the new Sfär Silica HC D give a significant performance improvement over the older SNAP Ultra equivalent columns, which coupled with the other advantages of the new columns result in a significant benefit to the user.