Onyx™ C18 Monolith Columns for Faster HPLC Separations

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Onyx™ C18 is a new silica monolithic reversed phase media that allows for fast separations with low column backpressure. Onyx allows for flow rates up to 9 mL/min to decrease run times without significant loss in efficiency.

Highly multiplexing applications as are found in combinatorial chemistry, clinical, and DMPK environments, high sample throughput. Many groups have tried to address this need by shortening run times for applications; however, traditional silica particulate columns have significant flow rate limitations due to the high backpressure of particle-based media (1). Silica monoliths, like Onyx, offer a unique solution for high-speed applications. The high efficiency along with the low backpressure of monolithic columns allow for dramatic increases in flow rate without corresponding losses in resolution for related analytes (2).

Materials and Methods

Analyses were performed using an HP 1100 LC system (Agilent Technologies, Palo Alto, CA, USA) equipped with a UV detector. The HPLC column used was an Onyx C18 100 x 4.6 mm (Phenomenex, Torrance, CA, USA). Geometric isomers (maleic acid and fumaric acid) were purchased from Sigma Chemicals (St. Louis, MO, USA). Solvents were purchased from Fisher Scientific (Fairlawn, NJ, USA).

For all chromatograms, analytes were injected on the Onyx C18 column running at different flow rates (listed in figure 1). Isocratic HPLC runs were performed using 0.1% trifluoroacetic acid in water/acetonitrile (95:5) for the mobile phase. Column was maintained at ambient temperature and elution of peaks was monitored by UV at 220 nm.

Results and Discussion

Chromatograms of analytes run at different flow rates on Onyx C18 are shown in figure 1. Maleic acid and fumaric acid were used, as they are geometric isomers and thus provide a good test for resolution of a column. As one can see, resolution is maintained even at high flow rates and shorter run times. Backpressures at each flow rate are also shown in figure 1. Such backpressures are significantly less than corresponding 3µ or 5µ particulate columns (data not show).

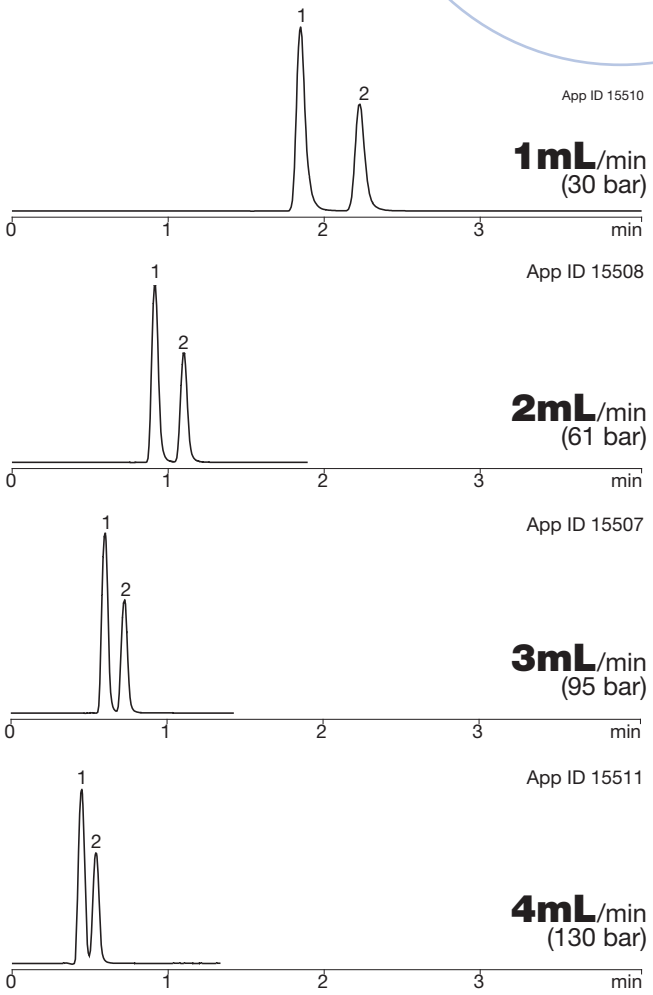

Figure 1: Separation of geometric isomers at different flow rates on an Onyx™ C18 monolith column. Analytes used: 1.Maleic acid, 2. Fumaric acid.

Conclusions

Onyx C18 with monolithic silica technology delivers good efficiency even at high flow rates making it an excellent solution for high-speed, high-throughput applications. The low backpressure generated allows for flow rate flexibility as well as the development of more rugged high-throughput applications.

References

1. D.Lubda et. al. LC/GC Europe. Dec. 2001, 14(12), 730-734
2. C. Schaefer et. al. American Laboratory. Apr. 2001, 33(9), 25-26