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Is super-high efficiency and 100 % aqueous stability not enough to convince you to try Luna® Omega UHPLC Columns? Well then, how about a unique selectivity for polar acidic molecules?

Selectivity for Polar Acids is Sweet!

Developing robust methods for the analysis of small, polar acidic compounds can be very challenging due to the simple fact that many do not retain well using typical reversed phase columns or with standard low pH mobile phases. When analyzing highly polar basic molecules, analysts have access to a range of ion-pairing agents (such as TFA or hexane sulfonic acid) that can greatly increase the retention of polar basic species. In addition, many column manufacturers offer unique reversed phase stationary phases that are specifically designed to improve the retention of these types of molecules. But ion-pairing agents for polar acids are not commonly used, and few LC media manufacturers offer reversed phase products specifically made for analyzing polar acids.

To address the gap, Phenomenex has recently created a new and novel C18 phase which contains a proprietary positively charged functional group (weakly basic in character) – our Luna® Omega PS C18 phase (available in 1.6 µm, 3 µm, and 5 µm particle sizes). The presence of the positively charged functional group, combined with the standard C18 bonding, results in a true mixed-mode interaction that can provide a unique selectivity and enhanced retention for many polar acidic species. In addition, the surface modification also allows the PS C18 column to be used in 100% aqueous conditions so that analysts can maximize polar acid retention by beginning their gradients in pure buffer.

You can see this in the separation of a group of polar organic acids in the figures below. For this set of molecules, we can achieve reasonable retention for the earliest eluting peaks, such as methyl succinate (Peak 1, Log P -0.24), using the standard C18 columns at a low pH mobile phase with the gradient starting in 3 % organic (**Figure 1**). The challenge in this

separation is the resolution of methylsuccinic acid from an isobaric related analyte, ethyl malonic acid (Peak 2). The unique selectivity afforded by the positively charged functional group of the Luna Omega PS C18 phase is clearly illustrated by the significant increase in separation between methylsuccinic acid and ethyl malonic acid (**Figure 2**).

Figure 1.
Waters® ACQUITY® BEH 1.7µm C18

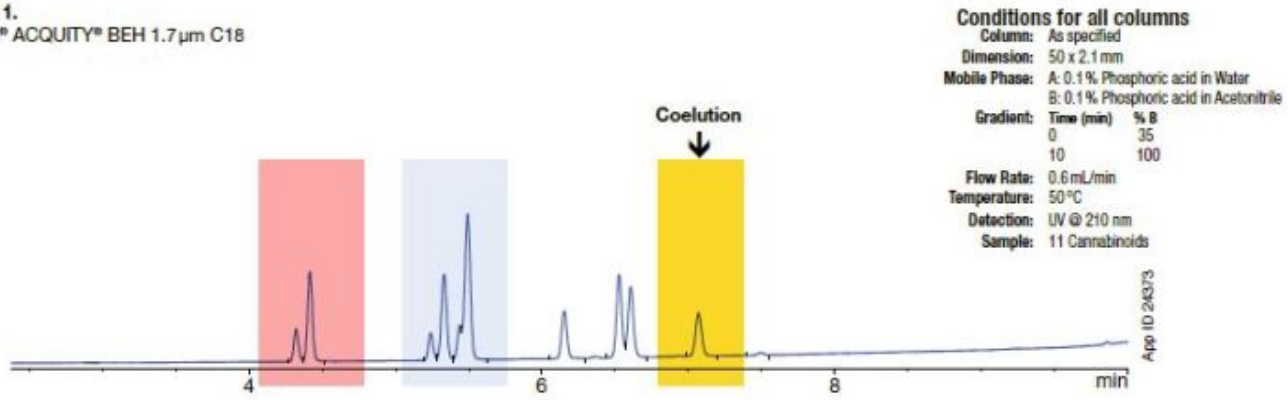
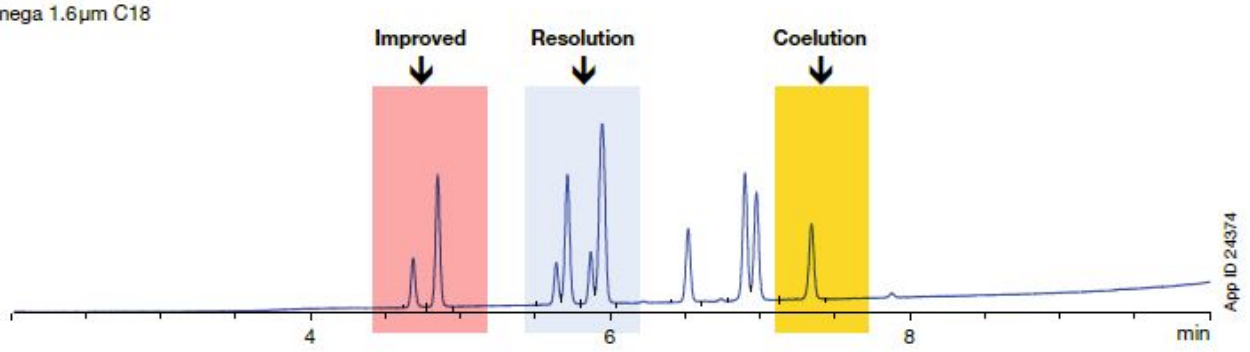
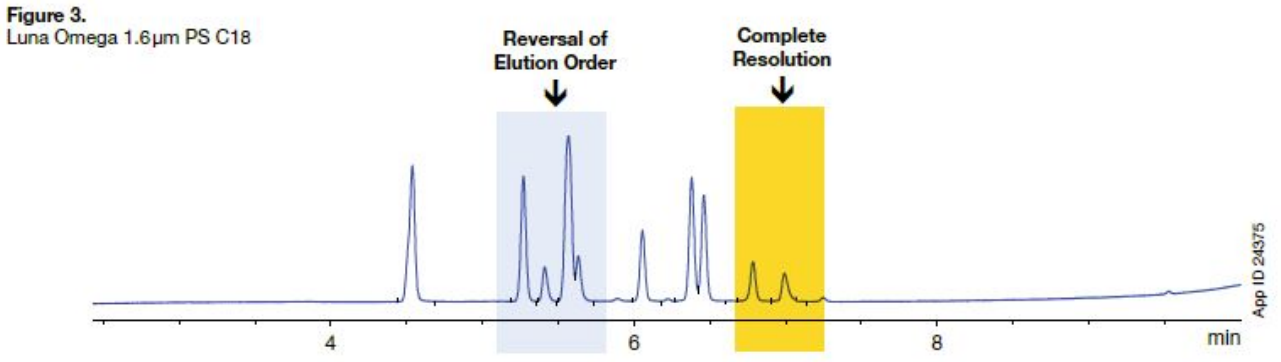


Figure 2.
Luna® Omega 1.6µm C18



The improved resolution gives analysts the confidence that slight variations in performance over time will not negatively impact accurate quantitation of these isobaric species. We can further improve this method by utilizing the aqueous stability of the Luna Omega PS C18 phase beginning our gradient in 100 % buffer (**Figure 3**). You can now see that we have the option to sacrifice a small amount of separation between the isobars to gain a dramatic improvement in retention (**Figure 3**). Together, by utilizing the unique properties of the Luna Omega PS C18 chemistry, we increase the overall retention for these polar acids and greatly improve the resolution between isobaric molecules.



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