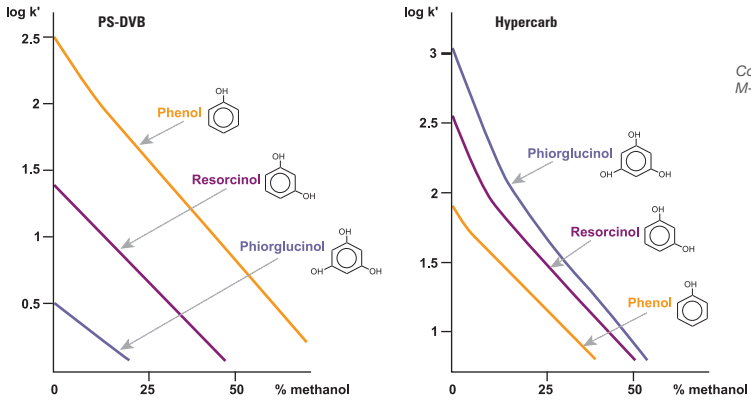
Increased retention of polar analytes

In typical reversed phase chromatography, the retention of an analyte is directly related to its hydrophobicity: the more hydrophobic the analyte, the longer its retention. Conversely, as the polarity of the analyte increases, analyte-solvent interactions begin to dominate and retention is reduced. This observation holds true for the majority of reversed phase systems. An exception to this rule is Hypercarb columns, for which retention may in some cases increase as the polarity of the analyte increases, illustrated to the right. This phenomenon is referred to as the "polar retention effect on graphite" (PREG). This property makes Hypercarb columns particularly useful for the separation of highly polar compounds (with logP as low as -4) that are normally difficult to retain and resolve on silica-based alkyl chain phases. The retention of very polar solutes on Hypercarb columns can be achieved without ion pair reagents or complex mobile phase conditions, as illustrated in the chromatogram below.

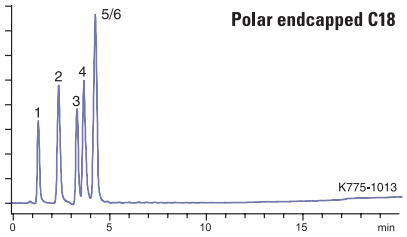


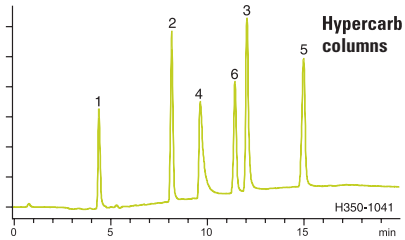
Courtesy V. Coquart and M-C. Henion, J. Chrom., 1992

Retention on Hypercarb columns increases as polarity of the analyte increases, which is the opposite of typical reversed phase materials such as PS-DVB

Extended pH range

One of the other key benefits of Hypercarb columns is the extreme stability of the phase to chemical or physical attack. Due to the unique characteristics of the media, it can withstand chemical attack across the entire pH range of 0 to 14, allowing applications to be run at pH levels that are incompatible with typical silica-based columns. Hypercarb columns offer more choice in buffer selection while handling both high temperature and high pressure.

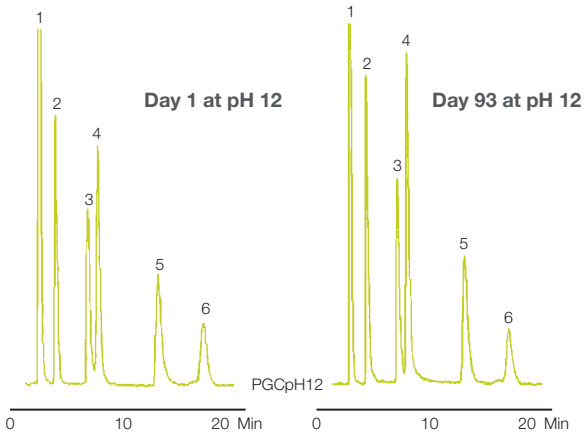




Hypercarb, 5µm, 100 x 0.32mm

Mobile Phase A:	H_2O + 0.1% formic acid
Mobile Phase B:	ACN + 0.1% formic acid
Gradient:	0 to 25% B in 15 minutes
Temperature:	25°C
Flow Rate:	8µL/min
Detection:	UV, 254nm
Analytes:	1. Cytosine 2. Uracil 3. Guanine 4. Adenine 5. Xanthine 6. Thymine

Additional retention is achieved for polar compounds using a Hypercarb column compared to a polar endcapped C18.
Note also the change in elution order.



Hypercarb, 5µm, 100 x 4.6mm

Mobile Phase:	MeOH:H_2O
Gradient:	70:30
Flow Rate:	0.7mL/min
Detection:	UV, 254nm
Analytes:	1. Acetone 2. Phenol 3. p-Cresol 4. Anisol 5. Phenetole 6. 3,5 -Xylenol

Hypercarb column stability at pH 12: retention and selectivity do not change even after 93 days of storage in 0.1M NaOH/MeOH

Hypercarb

Particle Size (µm)	Format	Length (mm)	ID (mm)	Cat. No.
3	Drop-in Guard (4/pk)	10	2.1	35003-012101
			3.0	35003-013001
			4.0 / 4.6	35003-014001
	HPLC Column	30	2.1	35003-032130
			3.0	35003-033030
		50	2.1	35003-052130
			3.0	35003-053030
			4.6	35003-054630
		100	2.1	35003-102130
			3.0	35003-103030
			4.6	35003-104630
		150	2.1	35003-152130
			3.0	35003-153030
			4.6	35003-154630
	High Temperature HPLC Column	30	2.1	35003-032146
		50	2.1	35003-052146
			4.6	35003-054646
		100	2.1	35003-102146
			3.0	35003-103046
			4.6	35003-104646
5	Drop-in Guard (4/pk)	10	2.1	35005-012101
			3.0	35005-013001
			4.6	35005-014001
	HPLC Column	30	2.1	35005-032130
			3.0	35005-033030
			4.6	35005-034630
		50	2.1	35005-052130
			3.0	35005-053030
			4.6	35005-054630
		100	2.1	35005-102130
			3.0	35005-103030
			4.6	35005-104630
		150	2.1	35005-152130
			3.0	35005-153030
			4.6	35005-154630
	High Temperature HPLC Column	30	2.1	35005-032146
			4.6	35005-034646
		50	2.1	35005-052146
			4.6	35005-054646
		100	2.1	35005-102146
			4.6	35005-104646
	Javelin HTS Column	20	2.1	35005-022135
	Preparative HPLC Column	100	10	35005-109070A
			21.2	35005-109270A
			30	35005-109370A
		150	10	35005-159070A
			21.2	35005-159270A

Format	Length (mm)	ID (mm)	Cat. No.
Uniguard Guard Cartridge Holder	10	1.0	851-00
		2.1	852-00
		3.0	852-00
		4.6	850-00