



HICHROM

Chromatography Columns and Supplies

LC COLUMN SELECTION PFP Bonded Phases

Catalogue 9

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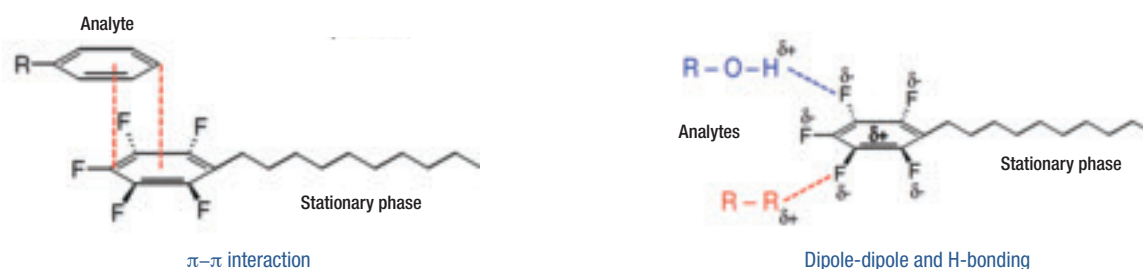
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Fluorinated stationary phases have shown novel selectivity for several classes of compounds and in many cases have proved useful as an alternative to traditional C18 and C8 phases. In particular, pentafluorophenyl (PFP) bonded phases are becoming increasingly popular when alternative selectivity is required. Details of these PFP phases are listed on this page. For other fluorinated phases please see individual manufacturer's pages (eg. Fluophase page 234, Wakopak Fluofix page 261).

Separation Mechanisms

PFP-bonded phases use multiple retention mechanisms for separation of challenging compounds. These interactions include hydrophobic, π - π interaction, dipole-dipole, H-bonding and shape selectivity. The predominance of each retention mechanism will be influenced by the solute's physicochemical properties, its structure and the chromatographic conditions utilised.

The electronegative fluorine atoms produce an electron deficient phenyl ring, so that the PFP phase acts as a Lewis acid or electron acceptor. This is the opposite of phenyl phases, which contain an electron rich aromatic ring. π - π interaction can occur with solutes that are rich in electrons (Lewis bases). The carbon-fluorine bonds of the PFP ring are very polar, thus enabling analytes to also be retained by dipole-dipole and H-bonding interactions, resulting in increased analyte retention.



Applications

PFP phases show excellent selectivity especially for highly polar analytes, aromatic and unsaturated compounds, phenols, halogenated compounds and taxanes. In addition, positional isomers show increased separation on PFP phases.

Due to the low bleed characteristics of many of the newer PFP phases, they are ideally suited for low UV wavelength and LC-MS applications. PFP phases are generally resistant to dewetting and can be used under highly aqueous conditions.

Figure 1 illustrates the orthogonal selectivity shown by a PFP compared to a C18 phase for the separation of phenol isomers.

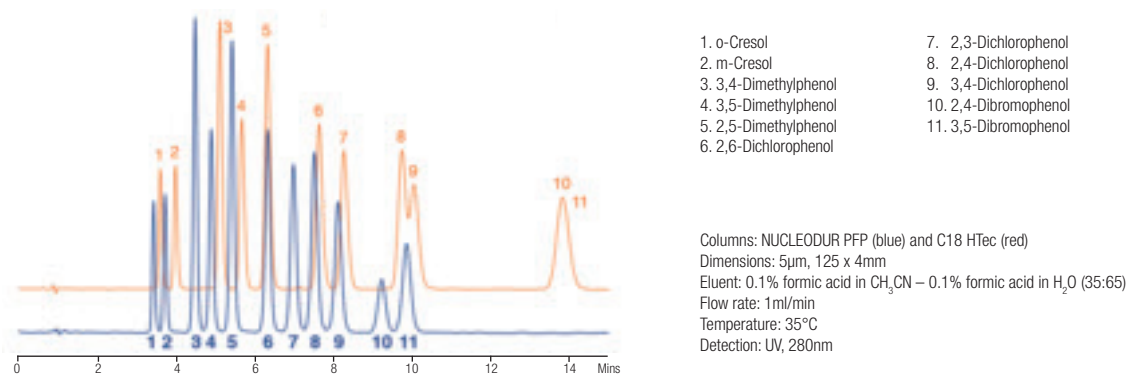


Figure 1. Separation of phenol isomers

PFP Bonded Phases

Phase	Manufacturer	Particle Size (μ m)	Pore Size (\AA)	Surface Area (m^2/g)	Page
Accucore PFP ¹	Thermo Scientific	2.6	80	130	223, 225, 227
ACE C18-PFP ²	ACT	2 ³ , 3, 5, 10	100	300	64, 66, 68, 74-77
Epic PFP-LB	ES Industries	1.8, 3, 5, 10	120	230	100
FluoroSep-RP Phenyl (FSP)		3, 5	60	350	101
HALO PFP ¹	Advanced Materials Technology	2.7	90	150	125, 126, 129
HALO-5 PFP ¹		5	90	90	125, 129
Hypersil GOLD PFP	Thermo Scientific	1.9, 3, 5, 8, 12	175	220	228, 230
NUCLEODUR PFP	Macherey-Nagel	1.8, 3, 5	110	340	157, 158, 160, 161
NUCLEOSHELL PFP ¹		2.7	90	130	162
Partisphere TAC-1	Hichrom	5	-	-	190, 191
PrincetonSPHER PFP	Princeton	3, 5	60, 100	-	203
YMC-Triart PFP	YMC	1.9, 3, 5	120	-	6

¹ Superficially porous phase ² C18 with integral PFP, classed as USP L1 ³ As ACE Excel column