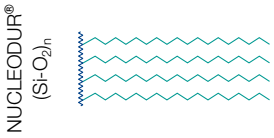
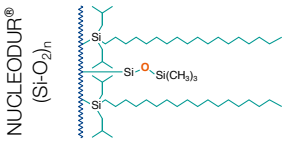
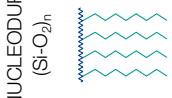
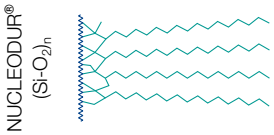
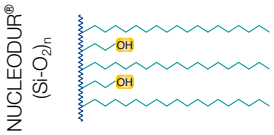
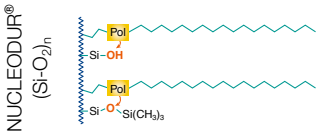
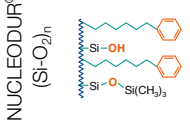
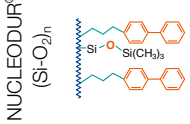
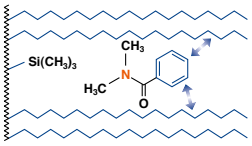
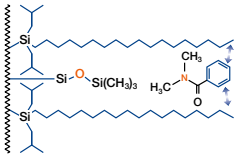
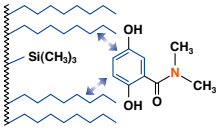
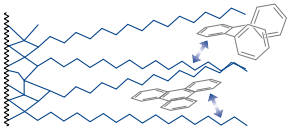
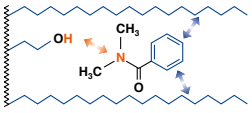
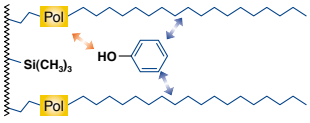
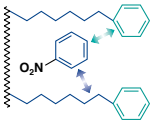
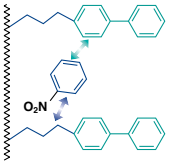
NUCLEODUR® phase overview

Overview of NUCLEODUR® HPLC phases

Phase	Specification	Page	Characteristic*	Stability	Structure
C_{18} Gravity	octadecyl, high density coating, multi-endcapping 18 % C · USP L1	158	A ●●●●● B ◖ C ●●◖	pH 1–11, suitable for LC/MS	
C_{18} Gravity-SB	octadecyl (monomeric), extensive endcapping 13 % C · USP L1	162	A ●●●● B ●●◖ C -	pH 1–9, suitable for LC/MS	
C_8 Gravity	octyl, high density coating, multi-endcapping 11 % C · USP L7	158	A ●●◖ B ● C ●◖	pH 1–11, suitable for LC/MS	
C_{18} Isis	octadecyl phase with specially crosslinked surface modification endcapping 20 % C · USP L1	164	A ●●●●◖ B ●● C ●●●●●	pH 1–10, suitable for LC/MS	
C_{18} Pyramid	octadecyl with polar endcapping 14 % C · USP L1	166	A ●●●● B ●●◖ C ●●	stable in 100 % aqueous eluent, pH 1–9, suitable for LC/MS	
PolarTec	octadecyl with embedded polar group 17 % C · USP L1 and L60	168	A ●●●● B ●●◖ C ●●●●	stable in 100 % aqueous eluent, pH 1–9, suitable for LC/MS	
Phenyl-Hexyl	phenylhexyl, multi-endcapping 10 % C · USP L11	170	A ●● B ●●● C ●	pH 1–10, suitable for LC/MS	
π^2	biphenylpropyl, multi-endcapping 17 % C · USP L11	172	A ●● B ●●●● C ●●●	pH 1.5–10	

* A = ● hydrophobic selectivity, B = ● polar / ionic selectivity, C = ● steric selectivity

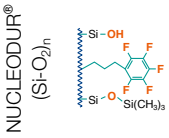
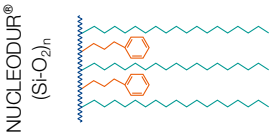
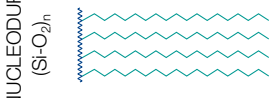
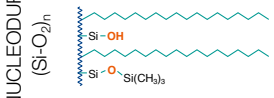
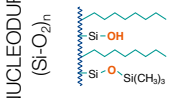
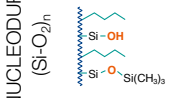
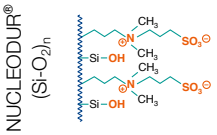
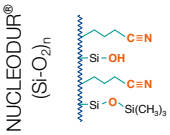
NUCLEODUR® phase overview

Application	Similar phases**	Interactions · retention mechanism	
in general compounds with ionizable functional groups such as basic pharmaceuticals and pesticides	NUCLEOSIL® C_{18} HD Xterra® RP18 / MS C18; Luna® C18(2), Gemini®, Synergi® Max RP; Zorbax® Extend-C18; Inertsil® ODS III; Purospher® STAR RP-18; Hypersil™ BDS	hydrophobic (van der Waals interactions)	
overall sophisticated analytical separations, especially for polar compounds, e.g., antibiotics, water-soluble vitamins, organic acids	–	hydrophobic (van der Waals interactions) with additional polar interactions	
like C_{18} Gravity, however, generally shorter retention times for nonpolar compounds	NUCLEOSIL® C_8 HD Xterra® RP8 / MS C8; Luna® C8; Zorbax® Eclipse XDB-C8	hydrophobic (van der Waals interactions)	
high steric selectivity, thus suited for separation of positional and structural isomers, planar / nonplanar molecules	NUCLEOSIL® C_{18} AB Inertsil® ODS-P; Pro C18 RS	steric and hydrophobic	
basic pharmaceuticals, very polar compounds, organic acids	Aqua, Synergi® Hydro-RP; AQ; Atlantis® dC18; Polaris® C18-A	hydrophobic and polar (H bonds)	
basic pharmaceuticals, organic acids, pesticides, amino acids, water-soluble vitamins	NUCLEOSIL® C_{18} Nautilus ProntoSIL® C18 AQ, Zorbax® Bonus-RP, Polaris® Amide-C18; Ascentis® RP Amide, SymmetryShield™ RP18; SUPELCOSIL™ LC-ABZ⁺; HyPURITY™ ADVANCE; ACCLAIM Polar AD.II	hydrophobic and polar (H bonds)	
aromatic and unsaturated compounds, polar compounds like pharmaceuticals, antibiotics	Luna® Phenyl-Hexyl; Zorbax® Eclipse Plus Phenyl-Hexyl; Kromasil® Phenyl-Hexyl	π-π and hydrophobic	
aromatic and unsaturated compounds, polar compounds like pharmaceuticals, antibiotics	Pinnacle® DB Biphenyl; Ultra Biphenyl	π-π and hydrophobic	

** phases which provide a similar selectivity based on chemical and physical properties

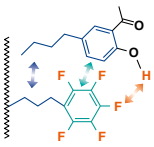
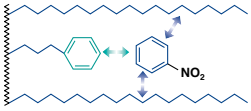
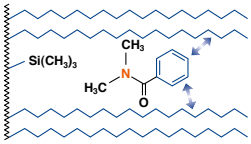
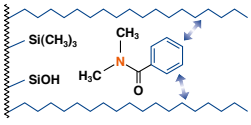
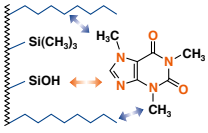
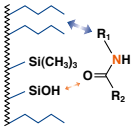
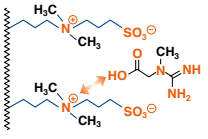
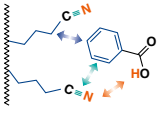
NUCLEODUR® phase overview

Overview of NUCLEODUR® HPLC phases

Phase	Specification	Page	Characteristic*	Stability	Structure
PFP	pentafluorophenylpropyl, multi-endcapping 8 % C · USP L43	174	A ●● B ●●●● C ●●●●	pH 1–9, suitable for LC/MS	
Sphinx RP	bifunctional, balanced ratio of propylphenyl and octadecyl, endcapping 15 % C · USP L1 and L11	176	A ●●● B ●●◖ C ●	pH 1–10, suitable for LC/MS	
C_{18} HTec	octadecyl, high density coating, high capacity, multi-endcapping 18 % C · USP L1	178	A ●●●●● B ◖ C ●●◖	pH 1–11, suitable for LC/MS	
C_{18} ec	octadecyl, medium density, endcapping available in 110 Å and 300 Å pore size 17.5 % / 4 % C · USP L1	181	A ●●●● B ● C ●●●◖	pH 1–9	
C_8 ec	octyl, medium density, endcapping 10.5 % C · USP L7	181	A ●● B ●◖ C ●●◖	pH 1–9	
C_4 ec	butyl, medium density, endcapping, 300 Å pore size 2.5 % C · USP L26	181	A ● B ●● C ●◖	pH 1–9	
HILIC	zwitterionic ammonium – sulfonic acid phase 7 % C	184	A ● B ●●●●● C -	pH 2–8.5	
CN / CN-RP	cyano (nitrile) for NP and RP separations 7 % C · USP L10	186	A ● B ●●●● C -	pH 1–8, stable towards highly aqueous mobile phases	

* A = ● hydrophobic selectivity, B = ● polar / ionic selectivity, C = ● steric selectivity

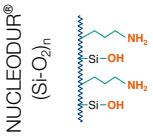
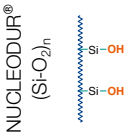
NUCLEODUR® phase overview

Application	Similar phases**	Interactions · retention mechanism	
aromatic and unsaturated compounds, halogen compounds, phenols, isomers, polar pharmaceuticals, antibiotics	ACQUITY® CSH Fluoro-Phenyl; Hypersil™ GOLD PFP; Luna® PFP(2); Discovery® HS F5; Allure® PFP Propyl; Ultra II PFP Propyl	polar (H bond), dipole-dipole, π-π and hydrophobic	
compounds with aromatic and multiple bond systems	no similar phases	π-π and hydrophobic	
robust and well base deactivated C_{18} phase; all separation tasks with preparative potential	Xterra® RP18 / MS C18 / SunFire™ C18; Luna® C18(2), Gemini®, Synergi® Max RP; Zorbax® Extend-C18; Inertsil® ODS III; Purospher® STAR RP-18; Hypersil® BDS	hydrophobic (van der Waals interactions)	
robust C_{18} phase for routine analyses	NUCLEOSIL® C_{18} Spherisorb® ODS II; Symmetry® C18; Hypersil® ODS; Inertsil® ODS II; Kromasil® C18; LiChrospher® RP-18	hydrophobic (van der Waals interactions) some residual silanol interactions	
robust C_8 phase for routine analyses	NUCLEOSIL® C_8 ec / C_8 Spherisorb® C8; Symmetry® C8; Hypersil® MOS; Kromasil® C8; LiChrospher® RP-8	hydrophobic (van der Waals interactions) some residual silanol interactions	
biological macromolecules like proteins or peptides	Jupiter® C4; ACE® C4	hydrophobic (van der Waals interactions) some residual silanol interactions	
hydrophilic compounds such as polar organic acids and bases, polar natural compounds	Sequant™ ZIC®-HILIC; Obelisc™	ionic / hydrophilic and electrostatic	
polar organic compounds (basic drugs), molecules containing π-electron systems	NUCLEOSIL® CN / CN-RP	π-π and polar (H bond), hydrophobic	

** phases which provide a similar selectivity based on chemical and physical properties

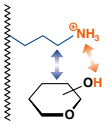
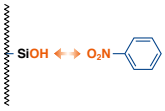
NUCLEODUR® phase overview

Overview of NUCLEODUR® HPLC phases

Phase	Specification	Page	Characteristic*	Stability	Structure
NH_2 / NH_2-RP	aminopropyl for NP and RP separations 2.5 % C · USP L8	188	A ● B ●●●● C -	pH 2–8, stable towards highly aqueous mobile phases	
SiOH	unmodified high purity silica · USP L3	190	A - B - C -	pH 2–8	

* A = ● hydrophobic selectivity, B = ● polar / ionic selectivity, C = ● steric selectivity

NUCLEODUR® phase overview

Application	Similar phases**	Interactions · retention mechanism	
sugars, sugar alcohols and other hydroxy compounds, DNA bases, polar compounds in general	NUCLEOSIL® NH_2 / NH_2-RP	polar / ionic and hydrophobic	
polar compounds in general	NUCLEOSIL® SiOH	polar / ionic	

** phases which provide a similar selectivity based on chemical and physical properties