

# Removing Separation Anxiety - New Concepts in HPLC

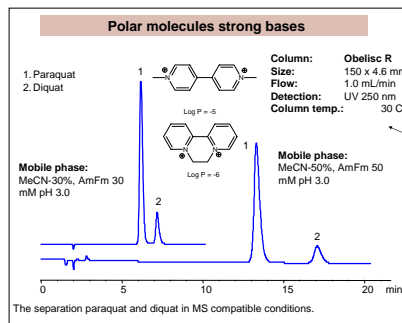
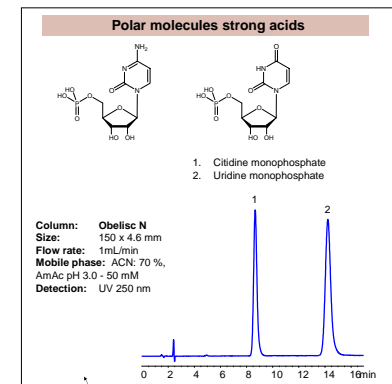
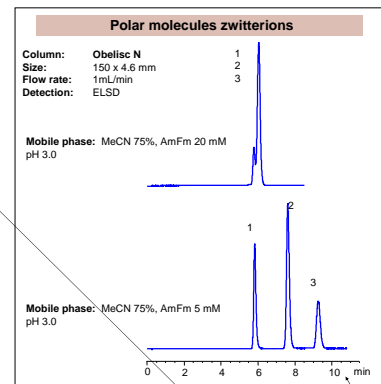
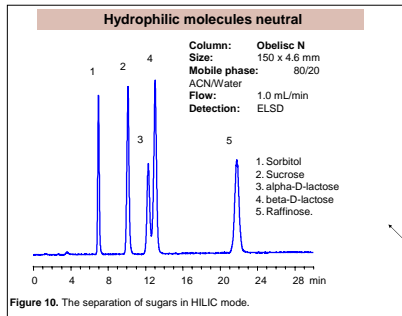


Vlad Orlovsky, Yury Zelechonok, Tatiana Zgibnev, SIELC Technologies, Prospect Heights, IL USA

## Abstract

The nature of samples analyzed today is constantly changing, resulting in an ever-increasing demand for analysis of complex mixtures with more polar and more hydrophobic and ionizable compounds. In need for universality, scientists at SIELC Technologies have created a Method Development Platform which can be used to analyze all major classes of compounds. The SIELC Method Development Platform is based on properties of analytes, mobile-phase composition, detection techniques, and complexity of analyzed mixture. Properties of compounds and stationary phases are studied and interlinked in order to provide guidance in method development. Polar and hydrophobic, acidic and basic compounds, zwitterions and neutral molecules – all can be separated with high-selectivity and efficiency during the same run. The flexibility of mixed-mode chromatography allows you to find conditions for different detection techniques (UV, MS, ELS, IR), and provides easy scale-up and high-throughput capabilities. This mixed-mode technology works well with difficult sample matrices and a variety of sample diluents.

New mixed mode stationary phases, based on SIELC's Liquid Separation Cell (LISC™) technology, are presented and described for effective method development. Effective ways to improve retention time, peak shape and loading are shown.



	Positively Charged		Neutral		Zwitterions		Negatively Charged	
Hydrophilic molecules	Inorganic cations, nucleobases, neurotransmitters		Sugars, diols, cyclodextrins		Amino acids		Inorganic anions, DNA, organosulfates, dronic acids	
	IC HILIC	Obelisc R Obelisc N	IC HILIC	Obelisc N	IC HILIC	Obelisc N	IC HILIC	Obelisc N Obelisc R
Hydrophobic molecules	Basic dyes, basic drugs		Aromatics, nitroaromatics, chlororganics		α-aminocaproic acid, peptides, proteins		Acidic drugs	
	RP NP	Obelisc R Obelisc N	RP NP	Obelisc R	RP HILIC IE	Obelisc R Obelisc N	RP NP	Obelisc N Obelisc R

**Conclusions**

Mixed-mode columns that contain two types of interactions, ion-exchange and reversed-phase, can be used as a universal platform for analytical and preparative separation of all classes of small molecules. High loading capacity and mobile phase adjustable selectivity further increases application range. LC-MS compatible separation conditions allow to use mass-driven fraction collection setting.

