Bridge Ion Separation Technology™

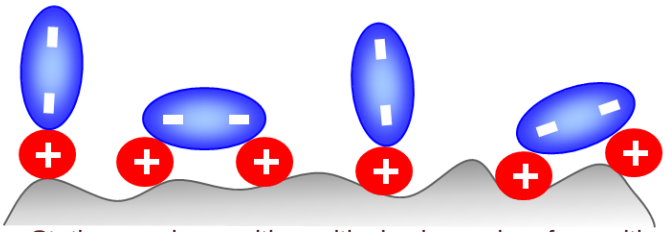
A new LC separation technique that can achieve many difficult or impossible separations with conventional methods and HPLC columns offered by SIELC Technologies!
BIST™ is a state-of-the-art separation tool with a broad and diverse range of applications for organic and inorganic charged molecules.

An advantage over traditional separation modes!

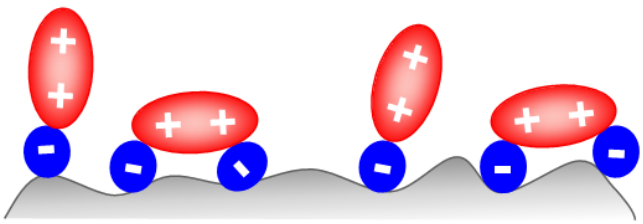
Compound type	RP	HILIC	IE	BIST
Neutral hydrophobic	yes	no	no	no
Neutral hydrophilic	no	yes	yes	yes
Charged hydrophobic	yes	no	yes	yes
Charged hydrophilic	no	yes	yes	yes
Multi-charged hydrophobic	yes	no	no	yes
Multi-charged hydrophilic	no	yes	no	yes

BIST™ allows you to analyze ions differently and more efficiently. The surface of the stationary phase can switch its polarity when doubly-charged ions are present in the mobile phase. For example, when ions such as sulfate ions (double negative charge in solution) are present, the positively charged surface becomes negatively charged and can be used to retain and separate positively charged analytes.

On the other hand, a negatively charged surface can switch its polarity when doubly-charged positive ions (diamines, Mg^{2+}, Ca^{2+}) are present in the mobile phase. Thus, a cation exchange column can be used to separate anions.



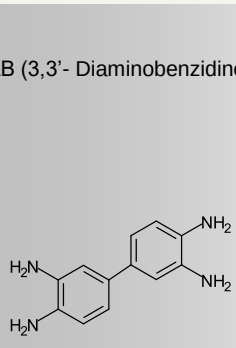
Stationary phase with positively charged surface with negative net charge



Stationary phase with negatively charged surface with positive net charge

© SIELC Technologies. 2023

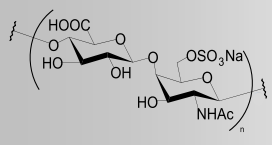
DAB (3,3'- Diaminobenzidine)



Column:	BIST™ B+
Column size:	4.6 × 100 mm, 5 µm
Column part number:	TBP-46.100.0510
Mobile phase:	Gradient MeCN – 80-30%, 10 min
Buffer:	H_2SO_4 - 0.2%
Flow rate:	1.0 mL/min
Detection:	UV 280 nm

3,3′-Diaminobenzidine (DAB) is an organic compound that is used in techniques such as immunoblotting and immunohistochemistry as a visualizing agent. DAB can be retained and analyzed using a BIST B+ column and a simple mobile phase made of water, acetonitrile, and sulfuric acid.

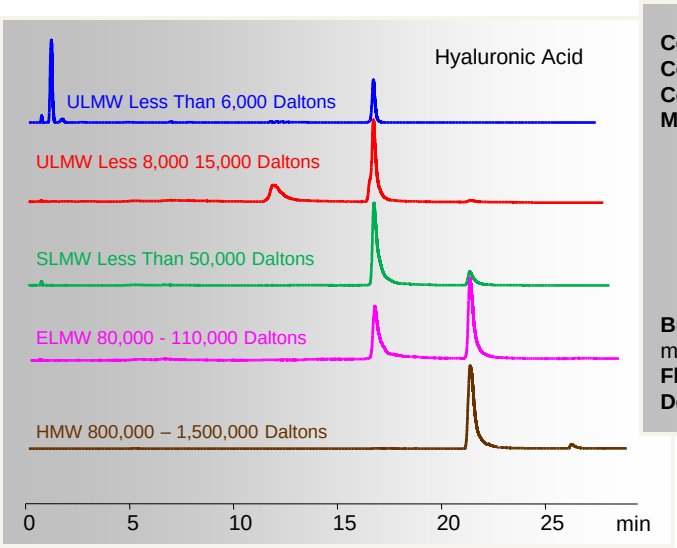
Chondroitin 6-sulfate
sodium salt
from shark cartilage



Column:	BIST™A	
Column size:	4.6 × 50 mm, 5 µm	
Column part number:	TA-46.50.0510	
Mobile phase:	Step Gradient:	
	Time, min	MeCN %
	0 → 4.9	60
	5→ 9.9	55
	10 → 14.9	50
	15 → 20	45
Buffer:	N,N'-Dimethylpiperazine formate 5.0 mM pH 4.0	
Flow rate:	1.0 mL/min	
Detection:	ELSD, 70ºC	

Chondroitin sulfate is one of the major components found in cartilage and is a sulfated glycosaminoglycan (GAG) composed of chains of alternating sugars. It is widely used as a therapeutic intervention for osteoarthritic conditions. By using a negatively charged, cation–exchange BIST A column, chondroitin sulfate can be characterized and retained. The mobile phase used for this method consists of acetonitrile, water, and N, N'-Dimethylpiperazine (DMP). DMP is a multi-charged, cationic buffer necessary for the formation of a "Bridge" in order to retain the compound.

© SIELC Technologies. 2023



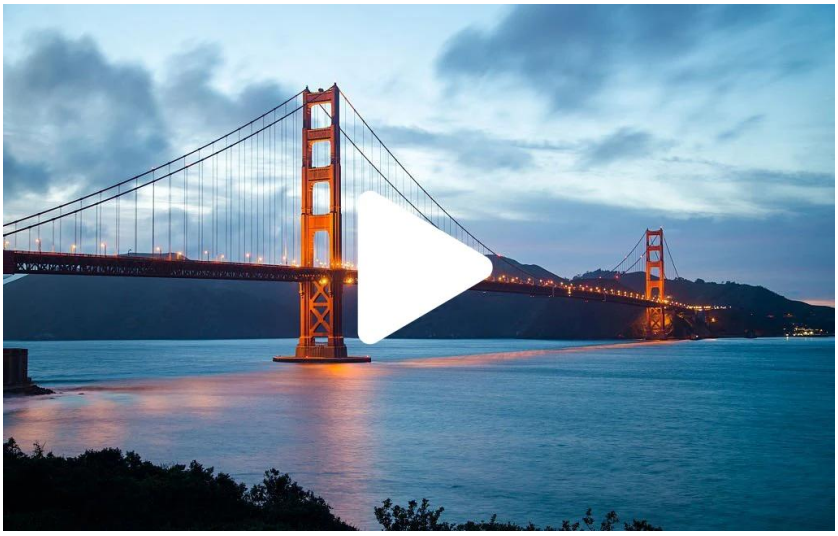
Column: BIST™A
Column size: 4.6 × 50 mm, 5 µm
Column part number: TA-46.50.0510
Mobile phase: Step Gradient:

Time, min	MeCN %
0 → 4.9	70
5→ 9.9	65
10 → 14.9	60
15 → 19.9	55
20→ 24.9	50
25→30	45

Buffer: N,N'-Dimethylpiperazine formate 5.0 mM pH 4.0
Flow rate: 1.0 mL/min
Detection: ELSD, 70ºC

Hyaluronic Acid (HA) is a glycosaminoglycan (GAG), an anionic polymer found in the extracellular matrix. It plays a crucial role in tissue regeneration due to its unique property to bind and retain water. Typical analysis of HA requires size exclusion separation technique, which is not very selective. HA can be analyzed much more efficiently using BIST technology and BIST A column with a mobile phase consisting primarily of organic modifiers such as acetonitrile and positive, doubly-charged buffers such as DMP.

WATCH THE BIST™ EXPLAINED!



Contact SIELC for additional information related to BIST technology: research@sielc.com

© SIELC Technologies. 2023