



**CHIRAL**  
**TECHNOLOGIES**

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DAICEL GROUP

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# *Immobilized Chiral Stationary Phases*

## *New Addition - CHIRALPAK® IG*

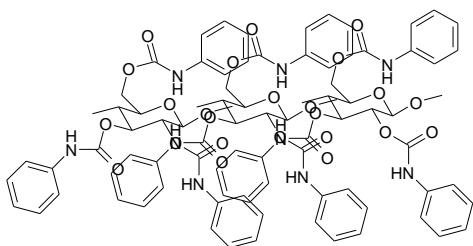
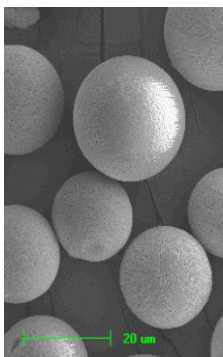


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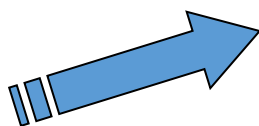
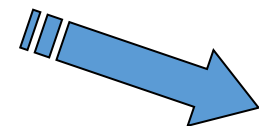
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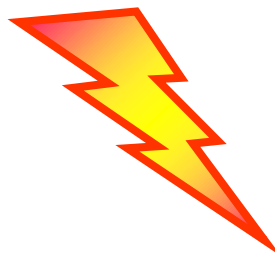
# Immobilization



Polymer



Proprietary Immobilization Techniques



**CSP**

CHIRALPAK IA  
CHIRALPAK IB  
CHIRALPAK IC  
CHIRALPAK ID  
CHIRALPAK IE  
CHIRALPAK IF  
CHIRALPAK IG

# *Why Immobilized Phases?*

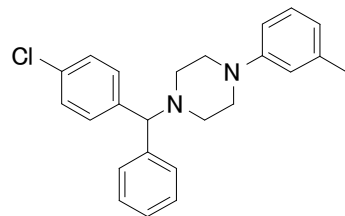
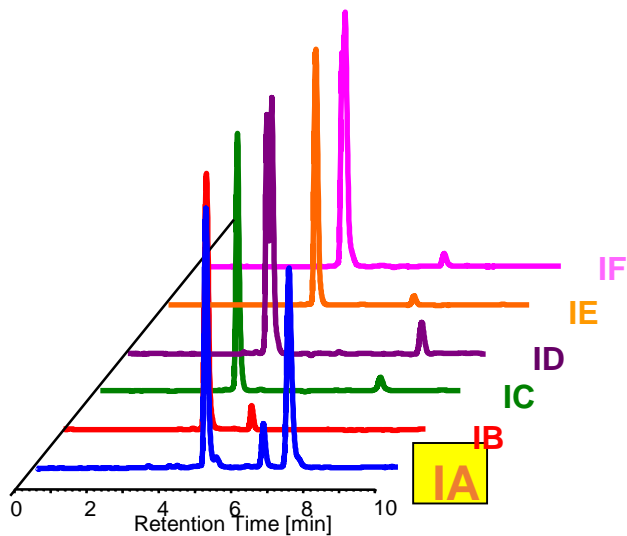
- Stable to all normal phase, polar & reversed phase solvents ... just like the achiral HPLC columns you use
- Solvent flexibility enhances the probability of success
- For preparative separations the wide range of compatible solvents allows best sample solubility
- Chiral Selectors previously not accessible, due to their solubility in the mobile phase, are now possible (CHIRALPAK IC / IE and ID)

# *Immobilized Stationary Phases*

<b>Attributes</b>	<b>Coated Selectors</b>	<b>Immobilized Selectors</b>
Reliability	Daicel authentic selectors	Daicel authentic selectors
Robustness	Restricted solvent selection	<b>Solvent flexibility</b>
Reproducibility	Affected by possible memory effects	<b>Easy column regeneration</b>
Loading capacity	High loading capacity	<b>High loading capacity greatly improved due to analyte solubility</b>

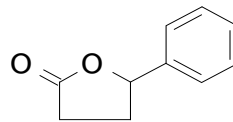
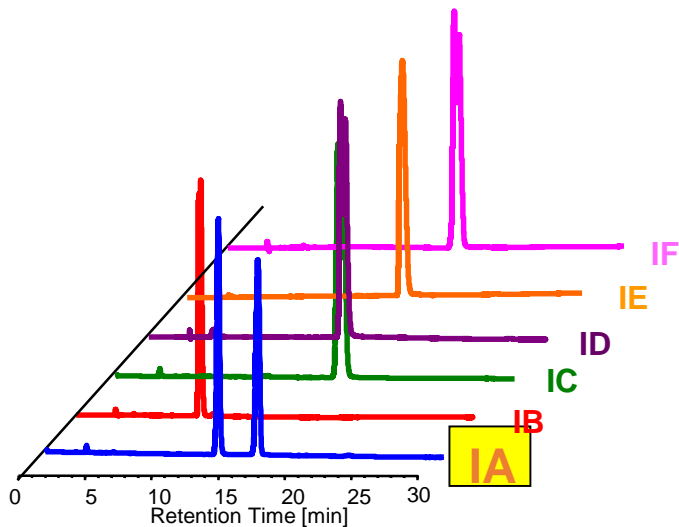
# *Innovative Column Technology*

# Complementarity CHIRALPAK IA



**Meclizine**

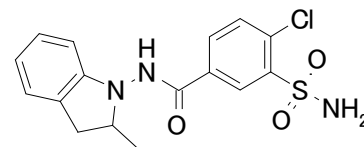
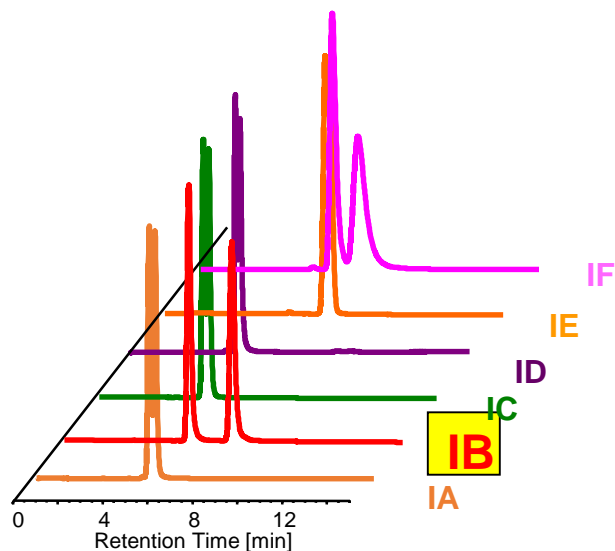
Column size 0.46mm ID x250mm long  
Mobile phase n-Hexane/IPA/DEA=95/5/0.1  
Flow rate 1.0ml/min.  
Temperature 25°C  
Detection UV 254nm



**$\gamma$ -Phenyl- $\gamma$ -butyrolactone**

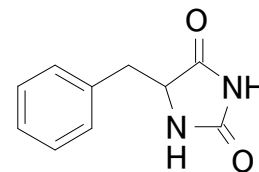
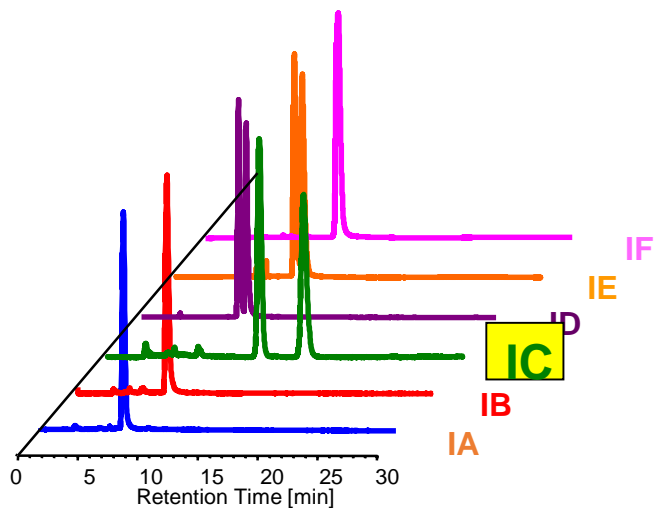
Column size 0.46mm ID x250mm long  
Mobile phase n-Hexane/EtOH=90/10  
Flow rate 1.0ml/min.  
Temperature 25°C  
Detection UV 220nm

# Complementarity CHIRALPAK IB & IC



Indapamide

Column size 0.46mm x250mm long  
Mobile phase n-Hexane/EtOH/DEA=50/50/0.1  
Flow rate 1.0ml/min.  
Temperature 25°C  
Detection UV 254nm

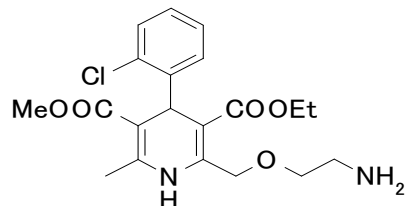
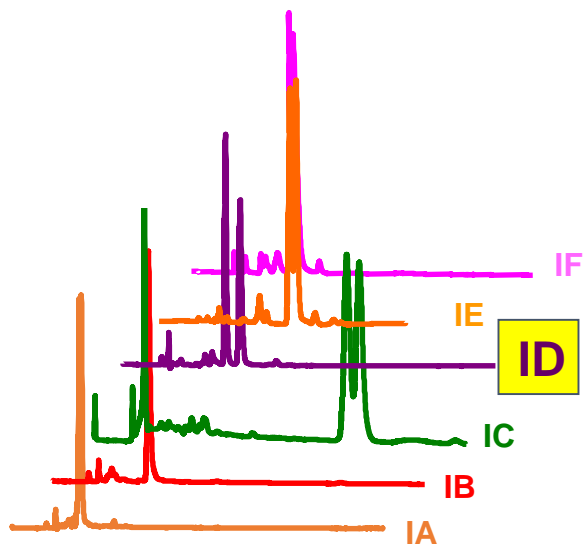


5-Benzylhydantoin

Column size 0.46mm x 250mm long  
Mobile phase n-Hexane/IPA=80/20  
Flow rate 1.0ml/min.  
Temperature 25°C  
Detection UV 220nm



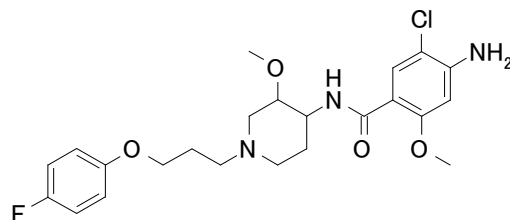
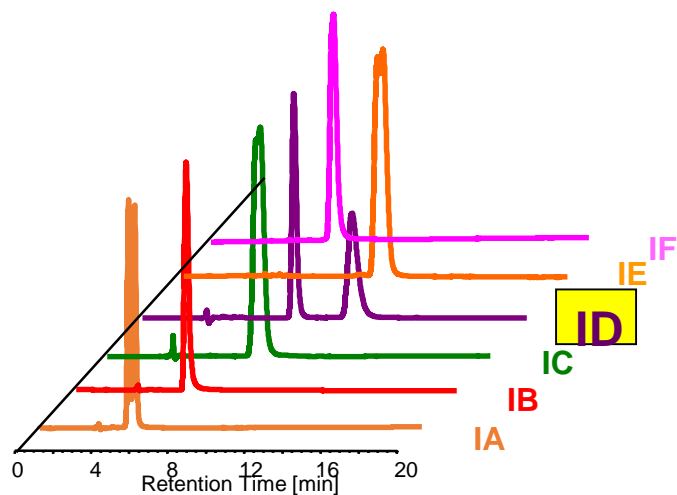
# Complementarity CHIRALPAK ID



**Amlodipine**

Column size 0.46mm x 25 mm long  
 Mobile phase n-hexane/IPA/MEA\*=80/20/0.1  
 Flow rate 1.0ml/min.  
 Temperature 40°C  
 Detection UV 254nm

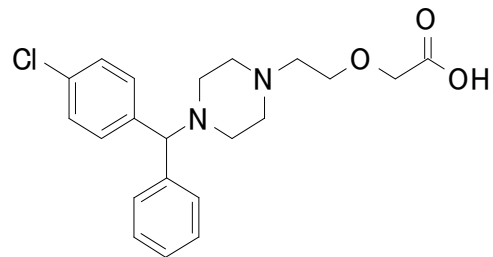
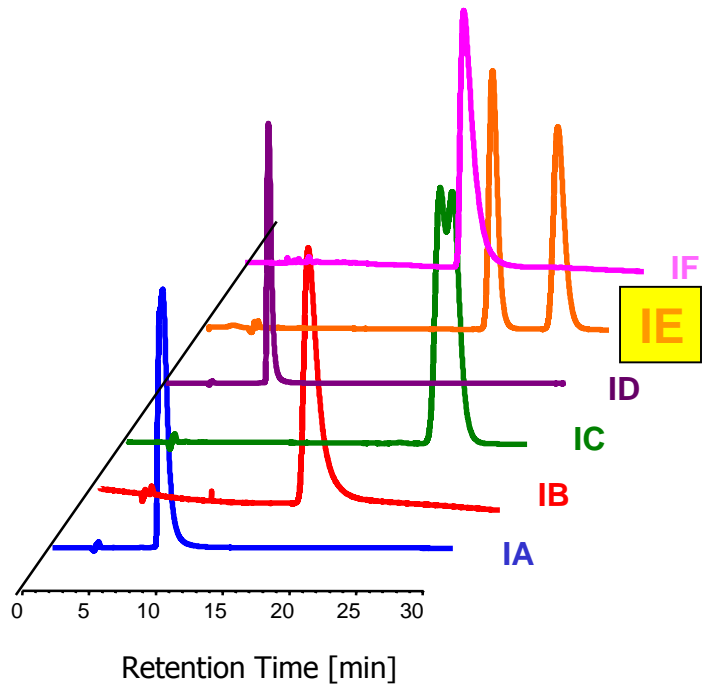
\*MEA=2-aminoethanol



**Cisapride**

Column size 0.46mm x 250mm long  
 Mobile phase n-Hexane/IPA/DEA=50/50/0.1  
 Flow rate 1.0ml/min.  
 Temperature 25°C  
 Detection UV 254nm

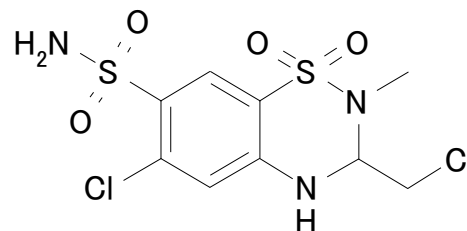
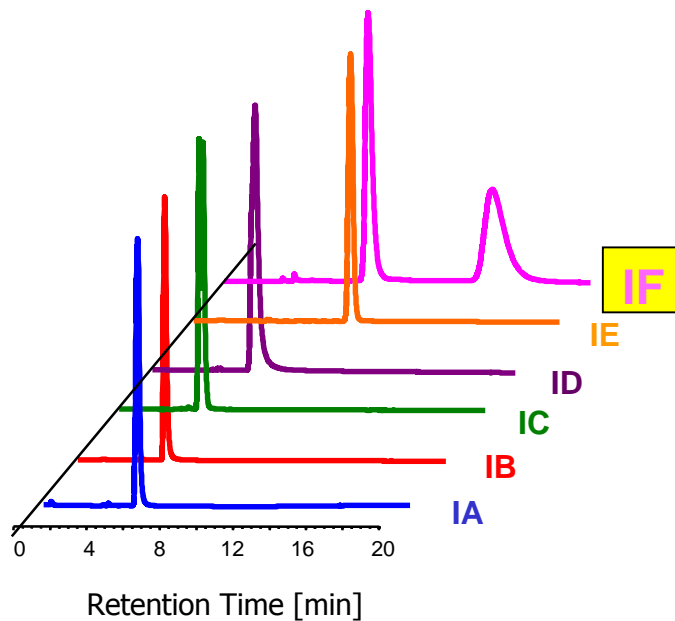
# Complementarity CHIRALPAK IE



**Cetirizine**

Column size	0.46mm ID x 250 mm long
Mobile phase	n-Hexane/EtOH/AcOH/DEA=50/50/0.1/0.1
Flow rate	1.0ml/min.
Temperature	25°C
Detection	UV 230nm

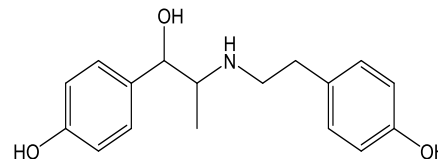
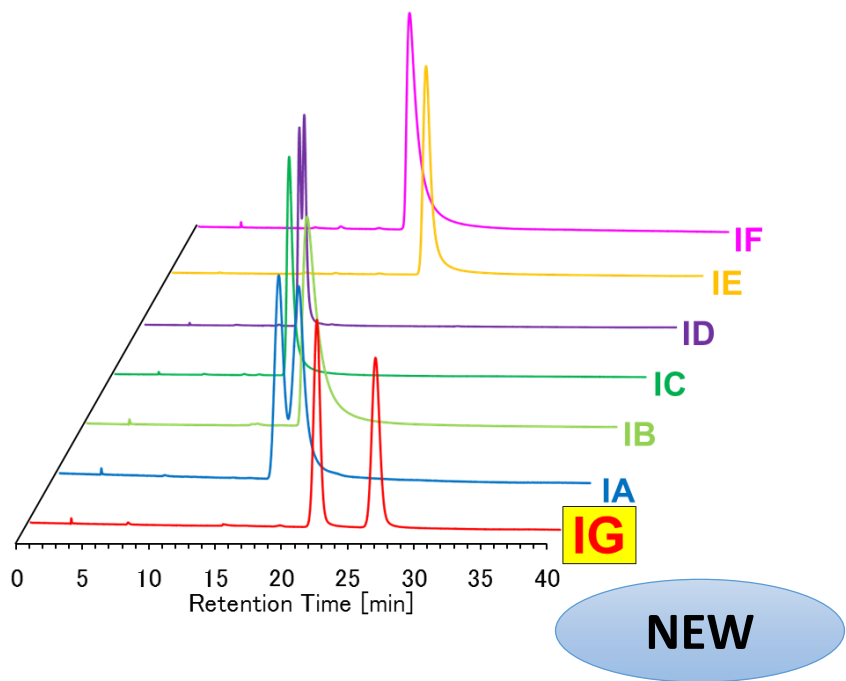
# Complementarity CHIRALPAK IF



**Methyclothiazide**

Column size	0.46mm ID x 250mm long
Mobile phase	n-Hexane/EtOH/DEA=50/50/0.1
Flow rate	1.0ml/min.
Temperature	25°C
Detection	UV 230nm

# Complementarity CHIRALPAK IG



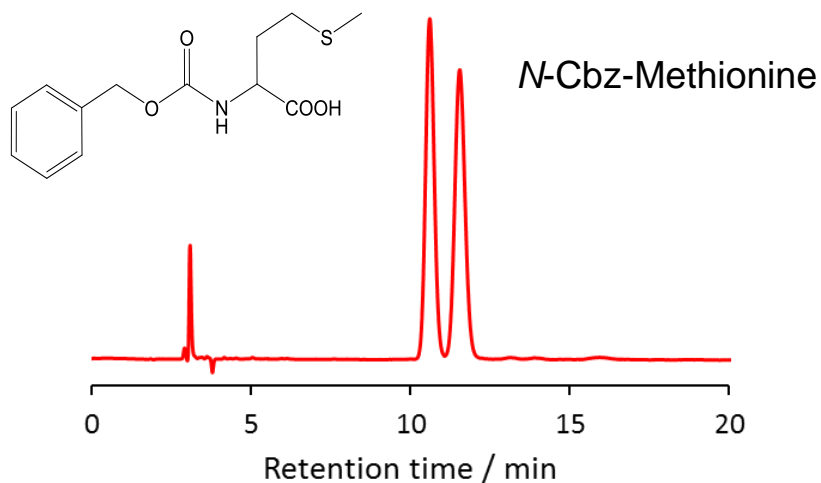
Ritodrine

Column size: 0.46cm I.D. × 25cm L  
Mobile phase: n-Hex/EtOH/DEA = 90/10/0.1  
Flow rate: 1.0ml/min.  
Temperature: 25°C  
Detection: UV275nm  
Injection: 5µL (1000mg/L in eluent)

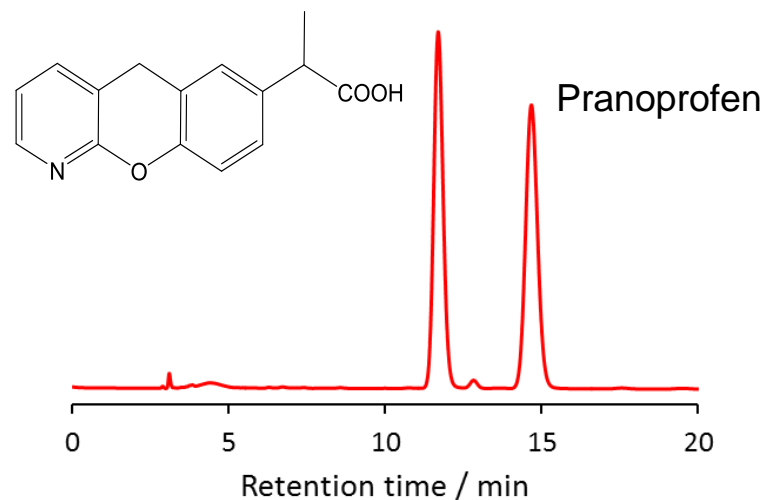
# ***CHIRALPACK IG Applications***

# Acidic Compounds – Normal phase

n-Hex/IPA/TFA=80/20/0.1



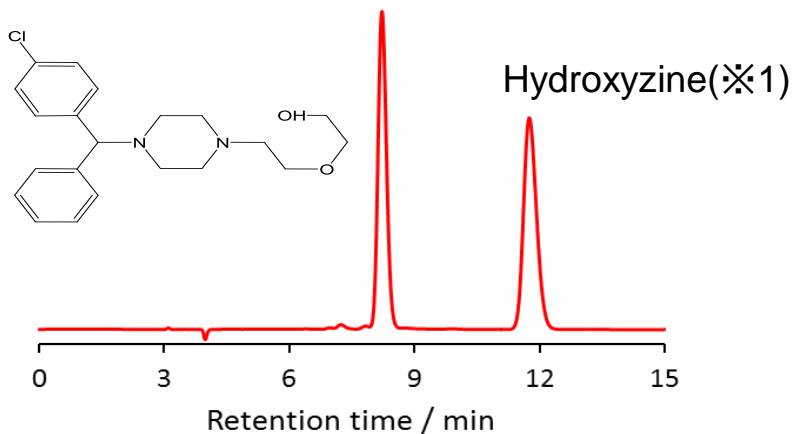
n-Hex/IPA/TFA=70/30/0.1



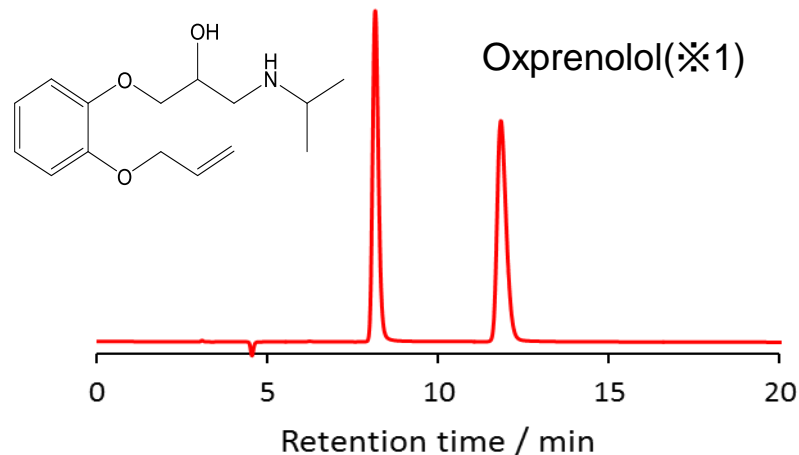
Condition: UV230nm, 0.46cmI.D. × 25cmL, 1.0mL/min, 25°C

# Basic Compounds – Normal Phase

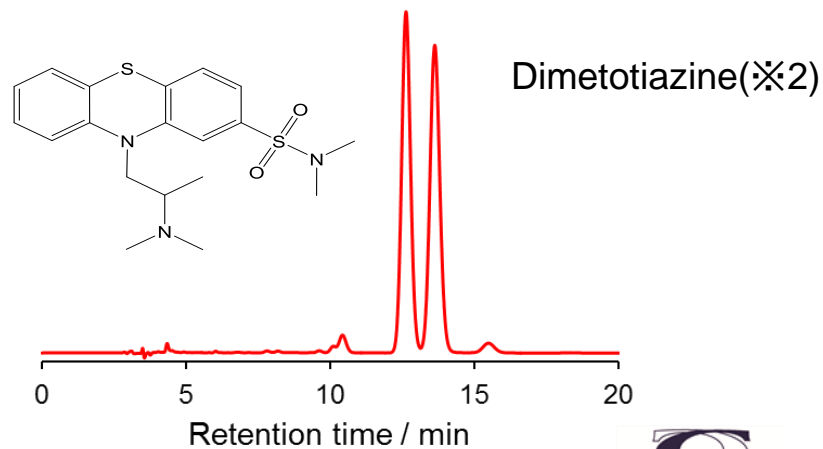
n-Hex/IPA/DEA=80/20/0.1



n-Hex/IPA/DEA=90/10/0.1



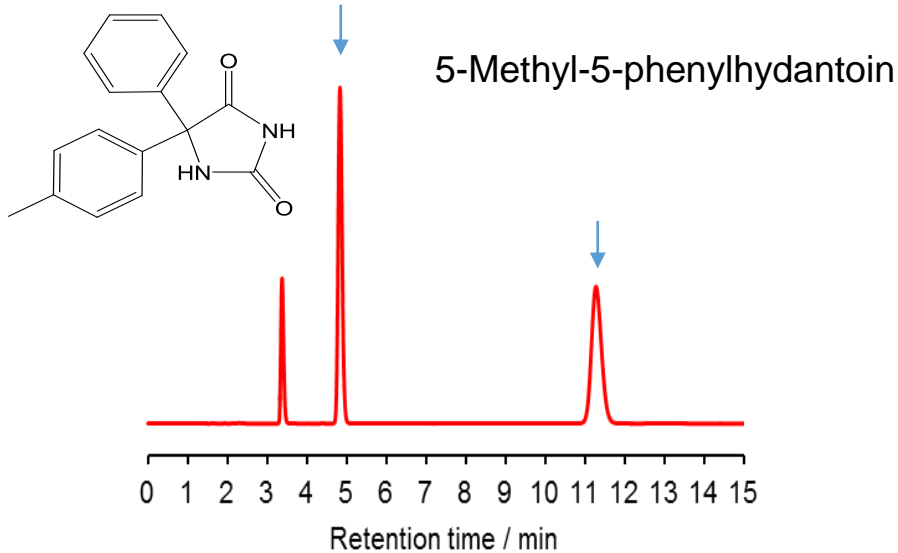
n-Hex/IPA/DEA=70/30/0.1



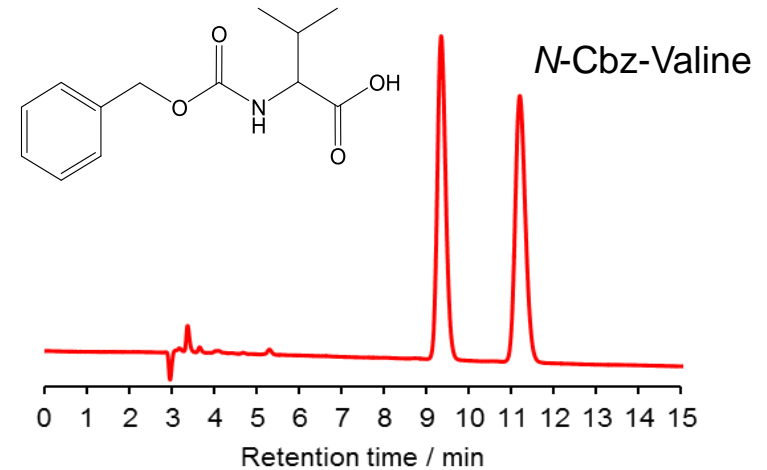
Condition: UV230nm(※1), UV254nm(※2),  
0.46cmI.D. × 25cmL, 1.0mL/min, 25°C

# Separation Example – Reversed Phase

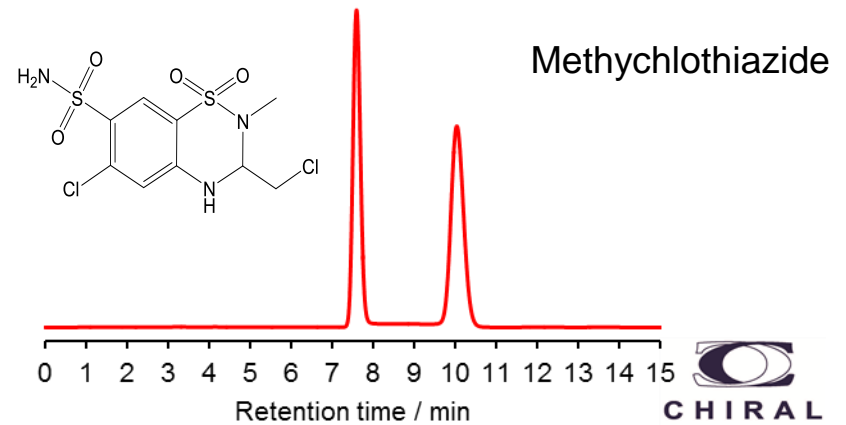
H<sub>2</sub>O/MeCN = 60/40



Phosphate aq.(pH2)/MeCN = 60/40



20mM NH<sub>3</sub>HCO<sub>3</sub>aq.(pH9 with DEA) /MeCN = 60/40



Condition:UV254nm, 0.46cmI.D. × 25cmL, 1.0mL/min, 25°C



# Complete Product Portfolio

## Polysaccharides: CHIRALPAK® and CHIRALCEL®

### Normal and Reversed Phases

- ✓ Immobilized polysaccharides: IA, IB, IC, ID, IE, IF, IG
- ✓ Coated polysaccharides:
  - AD, AS, AY, AZ
  - OB, OC, OD, OF, OG, OJ, OK, OZ
- ✓ 3- $\mu$ m polysaccharides: IA, IB, IC, ID, IE, IF, IG  
AD, AS, AY, AZ, OD, OJ, OZ, OX

### Specialty Selectors

- ✓ Protein-based Phases -- CHIRALPAK AGP, HSA and CBH
- ✓ Ligand Exchange: MA+, WH
- ✓ Chiral Crown Ethers: CROWNPAK CR, CR+, CR-
- ✓ Lindner Anion Exchange Phases: QD-AX, QN-AX
- ✓ ZWIX™ (*Zwitterionic Stationary Phases*)

# *Global Reach*

# Chiral Technologies Worldwide

