

Fast Method Scouting for Chiral Separation Utilizing CHIRAL ART Columns

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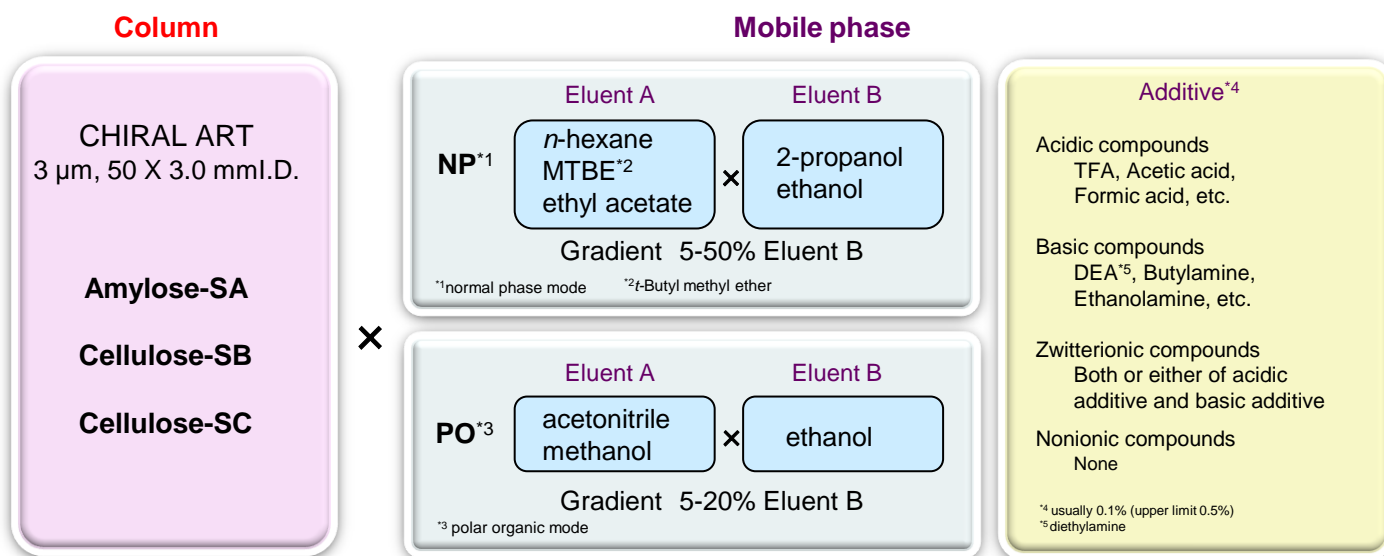
CHIRAL ART are HPLC columns with polysaccharide derivatives chiral selector, and are suitable for separations of wide range of chiral compounds.

On CHIRAL ART Immobilized type with high solvent versatility, chromatographers can freely choose the most suitable mobile phase by considering the solubility and resolution of the target compounds.

The excellent separation of various racemic compounds was achieved through fast method scouting utilizing the short columns and 3 μm CHIRAL ART immobilized type with three different chiral selectors.

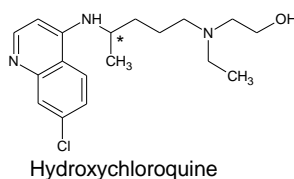
Method scouting

● Scouting protocol



● Experimental Matrix

mode	NP						PO		
	<i>n</i> -hexane		MTBE		ethyl acetate		acetonitrile	methanol	
Eluent A	<i>n</i> -hexane		MTBE		ethyl acetate		acetonitrile	methanol	
Eluent B	2-propanol	ethanol	2-propanol	ethanol	2-propanol	ethanol	ethanol	ethanol	
additive	0.1% DEA								
column	Amylose-SA								
	Cellulose-SB								
	Cellulose-SC								

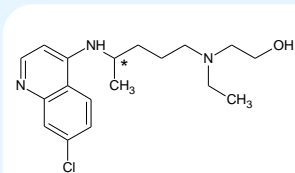


Column	: 3 μm, 50 X 3.0 mm.I.D.
Flow rate	: 0.85 mL/min
Gradient	: 5%B (0-0.5 min), 5-50%B (0.5-1.5 min), 50%B (1.5-2.0 min) for normal phase mode : 0%B (0-0.5 min), 0-20%B (0.5-1.5 min), 20%B (1.5-2.0 min) for polar organic mode
Temperature	: 25°C
Detection	: UV at 265, 290, 334 nm
Injection	: 2 μL (100 mg/mL)

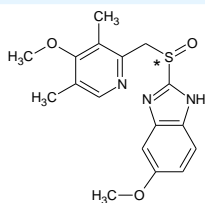
The baseline resolution is achieved under four conditions in the method scouting for hydroxychloroquine. The combination of Amylose-SA phase and MTBE/ethanol containing 0.1% DEA is selected as the most favorable condition in consideration of retention and resolution.

Separation results under simple isocratic conditions optimized through scouting of each compound

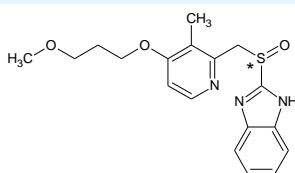
The combination of the short columns packed with three types of 3 μm particles and the rapid gradient elution of eight types of Normal Phase (NP) and Polar Organic (PO) mobile phase are employed for separation method scouting of pharmaceutical compounds below. The selected conditions from scouting with gradient elution for each compound are converted to the isocratic elution methods and optimized.



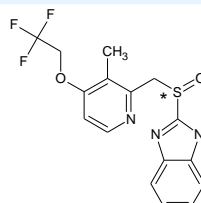
Hydroxychloroquine



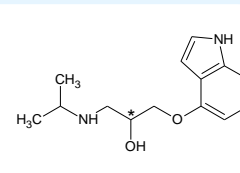
Omeprazole



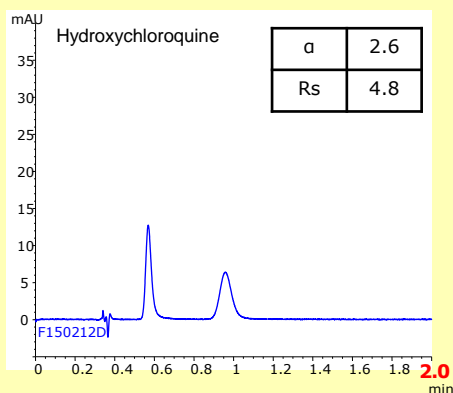
Rabeprazole



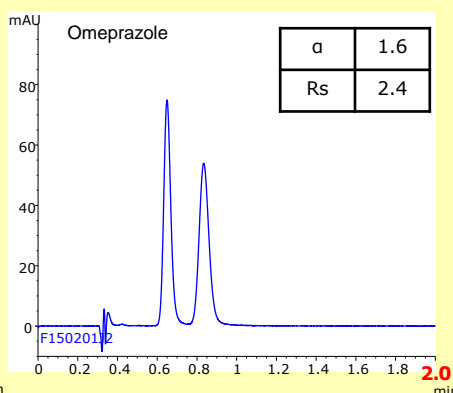
Lansoprazole



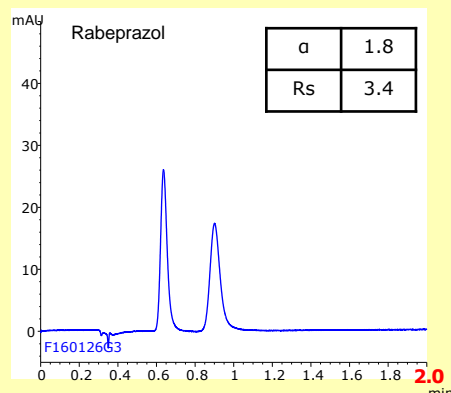
Pindolol



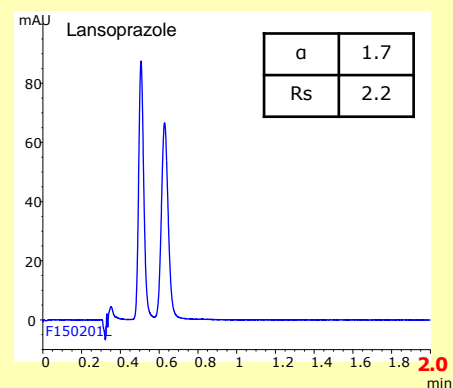
Column : CHIRAL ART Amylose-SA
3 μm , 50 X 3.0 mm.I.D.
Eluent : A) MTBE/DEA (100/0.1)
B) ethanol/DEA (100/0.1)
10%B
Flow rate : 0.85 mL/min
Temperature : 25°C
Detection : UV at 344 nm
Injection : 2 μL (100 $\mu\text{g}/\text{mL}$)



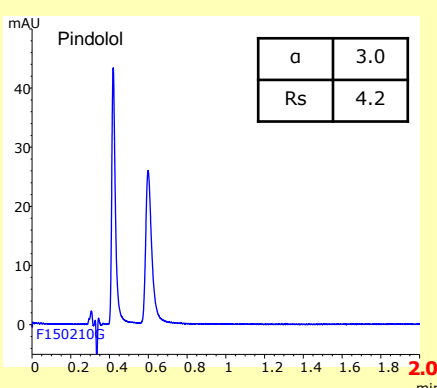
Column : CHIRAL ART Amylose-SA
3 μm , 50 X 3.0 mm.I.D.
Eluent : A) ethyl acetate/DEA (100/0.1)
B) ethanol/DEA (100/0.1)
5%B
Flow rate : 0.85 mL/min
Temperature : 25°C
Detection : UV at 290 nm
Injection : 2 μL (100 $\mu\text{g}/\text{mL}$)



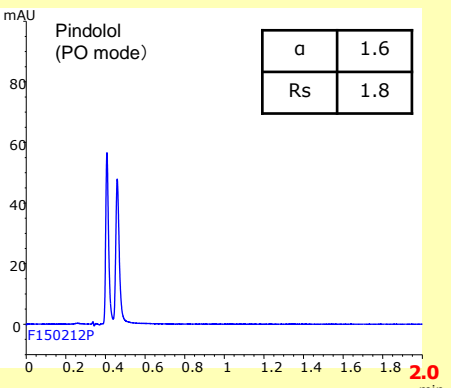
Column : CHIRAL ART Cellulose-SC
3 μm , 50 X 3.0 mm.I.D.
Eluent : A) ethyl acetate/DEA (100/0.1)
B) 2-propanol/DEA (100/0.1)
5%B
Flow rate : 0.85 mL/min
Temperature : 25°C
Detection : UV at 290 nm
Injection : 2 μL (100 $\mu\text{g}/\text{mL}$)



Column : CHIRAL ART Amylose-SA
3 μm , 50 X 3.0 mm.I.D.
Eluent : A) ethyl acetate/DEA (100/0.1)
B) ethanol/DEA (100/0.1)
5%B
Flow rate : 0.85 mL/min
Temperature : 25°C
Detection : UV at 290 nm
Injection : 2 μL (100 $\mu\text{g}/\text{mL}$)



Column : CHIRAL ART Cellulose-SB
3 μm , 50 X 3.0 mm.I.D.
Eluent : A) *n*-hexane/DEA (100/0.1)
B) ethanol/DEA (100/0.1)
60%B
Flow rate : 0.85 mL/min
Temperature : 25°C
Detection : UV at 265 nm
Injection : 2 μL (100 $\mu\text{g}/\text{mL}$)



Column : CHIRAL ART Cellulose-SB
3 μm , 50 X 3.0 mm.I.D.
Eluent : methanol/DEA (100/0.1)
Flow rate : 0.85 mL/min
Temperature : 25°C
Detection : UV at 265 nm
Injection : 2 μL (100 $\mu\text{g}/\text{mL}$)

DEA: diethylamine

- The fast method development chiral separations is allowed through the method scouting.
- The selected conditions from scouting with gradient elution for each compound are converted to the isocratic elution methods and optimized to achieve the ultra-fast separation method within 2 minutes.