

- Ion-exchange chromatography columns
XtalSpeed™ series
- Size-exclusion chromatography columns
MCI GEL™ CQP series

Bioseparation columns

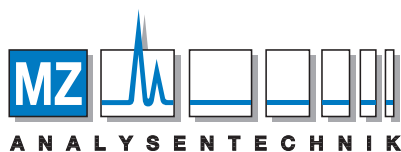
MCI GEL™ bioseparation columns are based on a hydrophilic, wide-pore, and rigid polymer designed for analytical chromatography of proteins, peptides, enzymes, and other biomolecules.

MCI GEL™ CQP series are used for size-exclusion chromatography.

XtalSpeed™ series are ion-exchange columns used for protein purification. High-quality target proteins are obtained with this column at a high recovery rate. XtalSpeed™ series are used for both analytical and preparative purpose in protein crystallography and NMR research.

XtalSpeed™ series are also used for antibody variant analysis and protein isoform analysis.

Column name	USP	Separation mode	Functional Group
XtalSpeed™ SP01	—	Cation exchange	Sulfopropyl(SP)
XtalSpeed™ DA01	—	Anion exchange	Diethyl amino ethyl(DEAE)
MCI GEL™ CQP06	L25	Size exclusion	—
MCI GEL™ CQP10	L38	Size exclusion	—
MCI GEL™ CQP30	L37, L38	Size exclusion	—



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XtalSpeed™ series Ion exchange chromatography columns

Ion exchange chromatography columns

XtalSpeed™ series columns are ion-exchange columns used for protein purification. They have been designed especially for protein crystallography and NMR research, and enable to purify target proteins with high quality at a high recovery rate and in a very short time and obtain protein crystals for further analysis.

We developed hydrophilic and chemically stable polymer layers based on highly porous polymer beads, reducing non-specific binding to the lowest level.

To eliminate other interactions and allow target proteins participate only in the ion-exchange mechanism, this column was able to separate similar proteins that other columns never succeeded to separate.

Even under large sample loading, this column maintains excellent selectivity. Taking these aspects into consideration, XtalSpeed™ series can be used as preparative columns for protein.

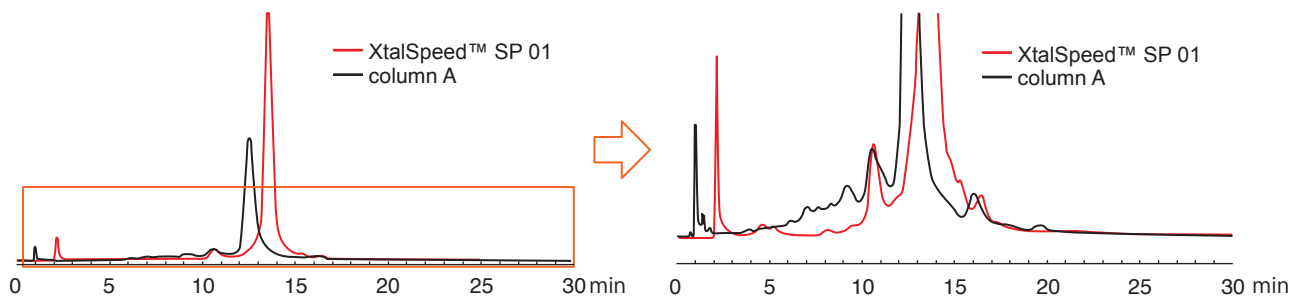
XtalSpeed™ SP01 is also used for antibody variant analysis.

Column list

Column name	Column size	Code	Housing	Functional Group
SP01	Φ4.6mm×50mm	0-047-11	PEEK	Sulfopropyl (SP)
	Φ4.6mm×100mm	0-047-12		
	Φ7.5mm×100mm	0-047-13		
	Φ11.5mm×100mm	0-047-14		
DA01	Φ4.6mm×50mm	0-047-01	PEEK	Diethylaminoethyl (DEAE)
	Φ4.6mm×100mm	0-047-04		
	Φ7.5mm×100mm	0-047-02		
	Φ11.5mm×100mm	0-047-03		

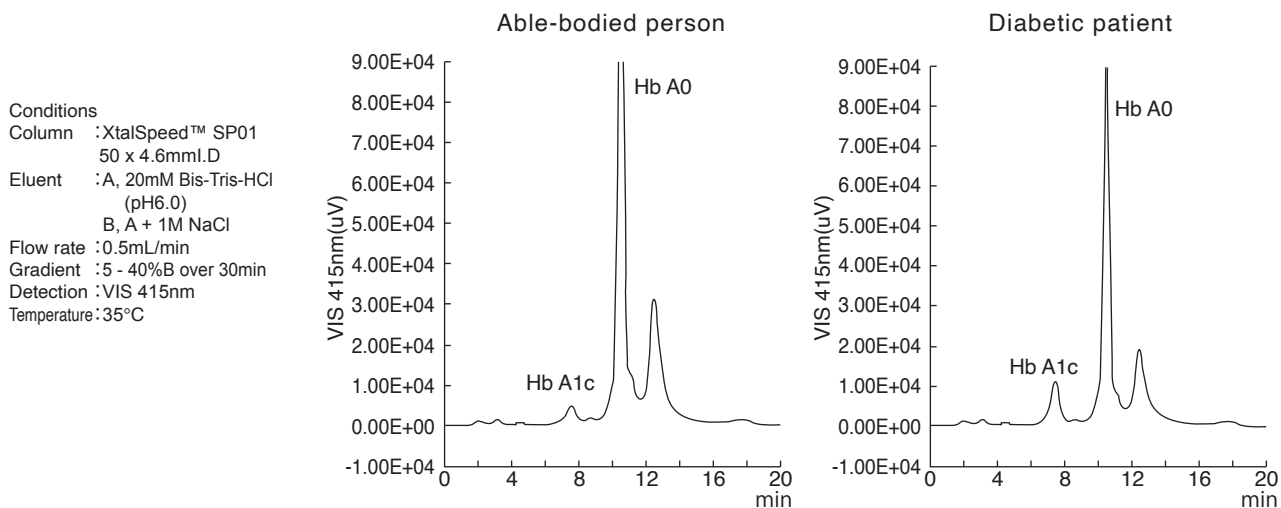
Application data of XtalSpeed™ series

Fig. 4-1 Analysis of Rituximab



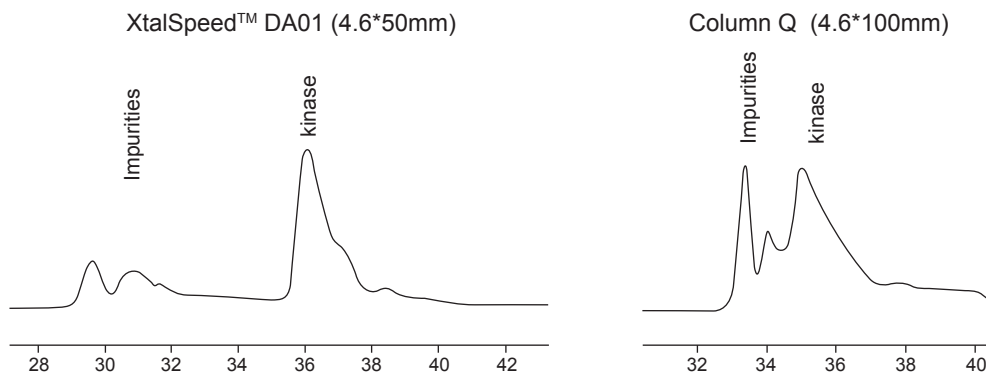
Conditions
 Column : XtalSpeed™ SP01
 100 x 4.6mmI.D
 Column A (250 x 4mmI.D)
 Eluent : A, 20mM Na phosphate (pH7.0)
 B, A + 1.0M NaCl
 Flow rate : 0.529mL/min for XtalSpeed and 1.0mL/min for ProPac
 Gradient : (A), 2.5-20.0%B over 30min + 20.0-100%B over 5min
 (C), 2.5-5.0%B over 30min + 5.0-100%B over 5min

Fig. 4-2 Analysis of Hemoglobin A1C



Conditions
 Column : XtalSpeed™ SP01
 50 x 4.6mmI.D
 Eluent : A, 20mM Bis-Tris-HCl
 (pH6.0)
 B, A + 1M NaCl
 Flow rate : 0.5mL/min
 Gradient : 5 - 40%B over 30min
 Detection : VIS 415nm
 Temperature : 35°C

Fig. 4-3 Comparison of loadability



Conditions
 Eluent : Buffer A:50mM HEPES-NaOH(pH7)
 Buffer B:50mM HEPES-NaOH(pH7),1M NaCl
 Flow rate : XtalSpeed™ DA01 :0.6mL/min
 Competitor's Column Q:1mL/min
 Gradient : 0-40%B (0-400mM NaCl)/40CV
 Sample : 50 micro grams of human kinase

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Size exclusion chromatography columns

Size exclusion chromatography is a liquid chromatographic technique which separates solute molecules according to their size in solution. The column is packed with porous particles and separation takes place as a result of the differential solute distribution outside and within the pores of the packing material. Solute molecules which are larger than the pores of the packing material will be excluded and therefore will elute first and have a lower retention time than the smaller one. The CQP series columns based on a hydrophilic polymer are designed for analysis of water soluble polymers such as oligosaccharides and PEG, etc.

Column list

● CQP series

MCI GEL™ column	USP	Column dimensions	Packing materials		Theoretical plates number [TP/column]	Exclusion limit [PEG]
			Particle size [μm]	Pore size [nm]		
MCI GEL™ CQP06	L25	7.5mm I.D. ×600mm	10	12	10000	~1×10 ³
MCI GEL™ CQP10	L38	7.5mm I.D. ×600mm	10	20	6000	~1×10 ⁴
MCI GEL™ CQP30	L37, L38	7.5mm I.D. ×600mm	10	60	6000	~1×10 ⁶

● Guard columns

MCI GEL™ column	Column dimensions
MCI GEL™ CQP06G	4.0mm I.D.×50mm
MCI GEL™ CQP10G	4.0mm I.D.×50mm
MCI GEL™ CQP30G	4.0mm I.D.×50mm

Application data of CQP series

Fig. 4-4 Calibration curve

Conditions
 Column : MCI GEL™ CQP06
 MCI GEL™ CQP10
 MCI GEL™ CQP30
 7.5mm I.D.×600mm
 Eluent : H₂O
 Flow rate : 1.0mL/min
 Column temp. : ambient
 Detection : RI
 Sample : PEG 100μl inj.

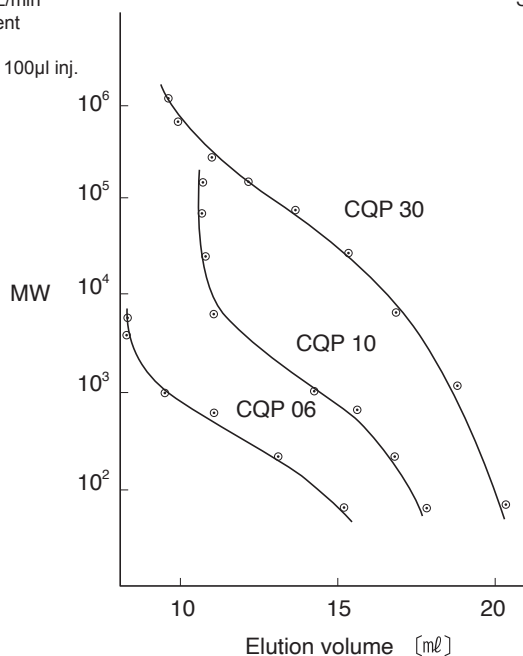


Fig. 4-5 Separation of PEG mixture

Conditions
 Column : MCI GEL™ CQP30 7.5mm I.D.×600mm
 Eluent : H₂O
 Flow rate : 1.0mL/min
 Column temp. : 25°C
 Detection : RI
 Sample : 1. PEG 145,000
 2. 40,000
 3. 6,000

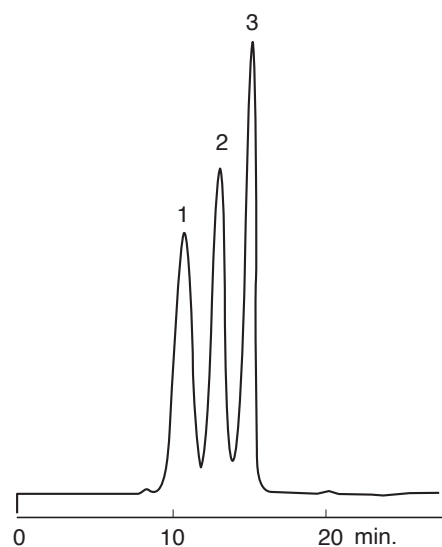


Fig. 4-6 Separation of protein mixture

Conditions
 Column : MCI GEL™ CQP30 7.5mm I.D.×600mm
 Eluent : 14mM Tris-HClO₄ buffer
 Flow rate : 1.0mL/min
 Column temp. : ambient
 Detection : 280nm
 Sample : 1. Ferritin (MW440,000)
 2. Ovalbumin (MW43,000)
 3. Myoglobin (MW17,500)
 4. Cytochrome c (MW12,400)

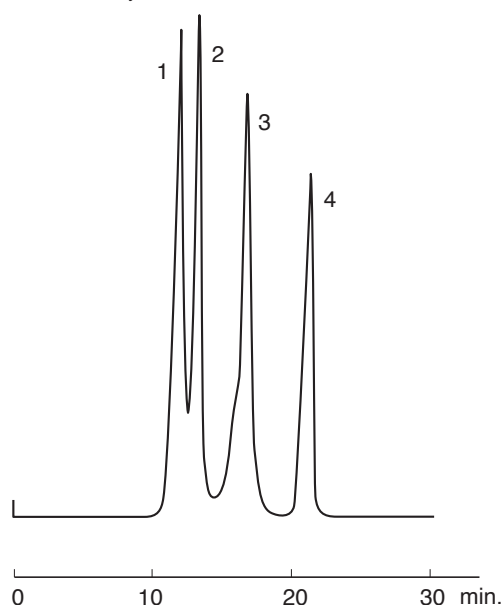


Fig. 4-7 Separation of gluconic acid and glucose

Conditions
 Column : MCI GEL™ CQP06 7.5mm I.D.×600mm
 Eluent : H₂O
 Flow rate : 0.8mL/min
 Column temp. : ambient
 Detection : RI
 Sample : 1. 5% Gluconic acid
 2. 5% Glucose

