3 MCI GEL™ Ion chromatography columns and materials

○Cation chromatography column MCI GEL™ SCK01
○Cation chromatography column MCI GEL™ CHK45/C05
○Anion chromatography column MCI GEL™ SCA04

The MCI GEL™ ion chromatography columns are based on surface functionalized cation and anion exchange resins designed for non-suppressed ion chromatography applications. The non-suppressed ion chromatography is an analysis technique of cations and anions with combination of a packed column of low capacity ion exchange resin and low concentration of electrolyte solution as an eluent. The advantage of the ion chromatography is that several ions can be analyzed by only one injection with free of complicated sample pre-treatment.

Cation chromatography column MCI GEL™ SCK01

Packing material of MCI GEL™ SCK01 is crosslinked polystyrene functionalized with sulfonic acid. This column is characterized by excellent resolution and rapid analysis for monovalent and divalent cations. Standard monovalent cations like Li+, Na+, NH4+, K+, Rb+, Cs+ and simple amines such as mono-, di- and trimethylamine can be resolved using a nitric acid solution as eluent. Divalent cations, such as alkaline earth metals and transition metal elements, can be efficiently resolved using tartaric acid and complexing reagent such as ethylene diamine to selectively elute the metals from the column.

■Note:
When using the MCI GEL™ SCK01 column for monovalent cations, it is recommended that a pre-column, MCI GEL™ SCK-PC, be used to trap heavy metals which might otherwise poison the SCK01 column resulting in a rapid loss of capacity and chromatographic performance.

Cation chromatography Column MCI GEL™ CHK45/C05

Packing material of MCI GEL™ CHK45/C05 is made of crosslinked polymethacylate functionalized with carboxylic acid. By use of simple eluent system, MCI GEL™ CHK45/C05 can separate both monovalent and divalent cations in tap water, river water and other environmental water samples.

Anion chromatography column MCI GEL™ SCA04

Packing material of MCI GEL™ SCA04 is based on a hydrophilic viniyl polymer matrix functionalized with quaternary ammonium group and particle size of 5 μm. A solution of potassium hydrogen phthalate and a vanilic acid (VA)/N-methyldiethanolamine (MDEA) solution both can be used as a mobile phase. The unique VA/MDEA eluent, is developed for the SCA04 column, which allows users to determine 7 standard anions in 14 minutes without system peak.

■Note:
A pre-column, MCI GEL™ SCA-PC is recommended for prevention of contamination to the SCA04 column when the VA/MDEA eluent is used. The SCA-PC is effectively prolong SCA04 column life. The SCA-PC should be installed between an outlet of HPLC pump and an sample injector.

SCA04 4.6×150 PEEK

Column list

Cation analysis	MCI GEL™ SCK01	6mm I.D×50mm	Stainless steel column
Cation analysis	MCI GEL™ SCK01	4.6mm I.D×150mm	Stainless steel column
Pre-column for cation analysis	MCI GEL™ SCK-PC	6mm I.D×50mm	Stainless steel column
Cation analysis	MCI GEL™ CHK45/C05	4.6mm I.D×150mm	Stainless steel column
Anion analysis	MCI GEL™ SCA04	4.6mm I.D×150mm	PEEK column
Pre-column for anion analysis	MCI GEL™ SCA-PC	8mm I.D×10mm	Stainless steel column

*USP L31 column

Application data of SCK01

Fig. 3-1 Monovalent cations

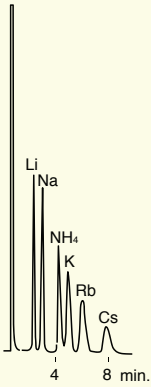


Fig. 3-2 Amines

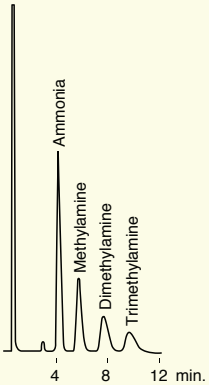


Fig. 3-3 Monovalent cations in rain

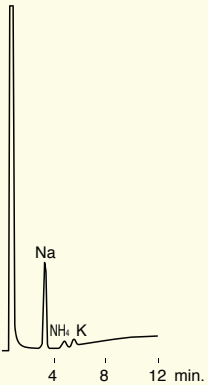


Fig. 3-4 Monovalent cations in tap water

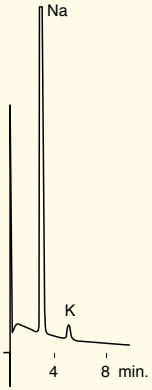


Fig. 3-5 Sports drink

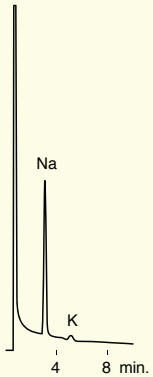
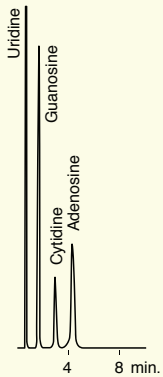


Fig. 3-6 Nucleoside



Conditions
Column : MCI GEL™ SCK01 6mm I.D.×50mm
Eluent : 5mM HNO_3
Flow rate : 1.0 mℓ /min
Column temp. : 40°C
Detection : Conductivity (Fig. 3-1, 3-2, 3-3, 3-4, 3-5) 254nm (Fig. 3-6)

Application data of SCK01

Fig. 3-7 Alkaline earth metals

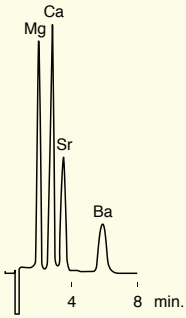


Fig. 3-8 Transition metals

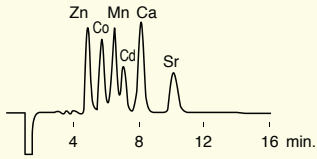
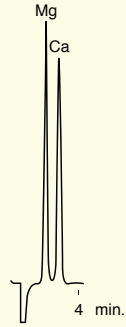


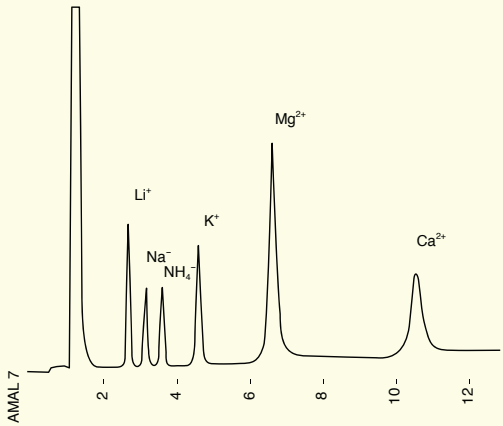
Fig. 3-9 Divalent cations



Application data of CHK45/C05

Fig. 3-10 Mono, Divalent cations

Conditions
Column : MCI GEL™ CHK45/C05 (SUS)
4.6mm I.D.×150mm
Eluent : 4mM H_2SO_4
Flow rate : 1.2 mℓ/min
Temp. : 40°C
Detection : Conductivity
Sample inj : 100µL
Li (0.5ppm), Na (1ppm), NH4 (1ppm), K (4ppm), Mg (4ppm), Ca (4ppm)



(Data provided by Professor Yokoyama of Yokohama National University)

Application data of SCA04

Fig. 3-11 Standard anions
eluent ; VA/MDEA

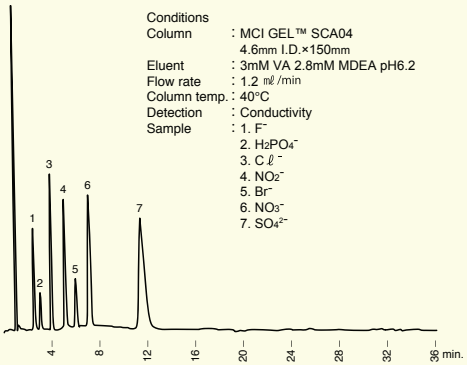


Fig. 3-12 Standard anions
eluent ; Potassium hydrogenphthalate

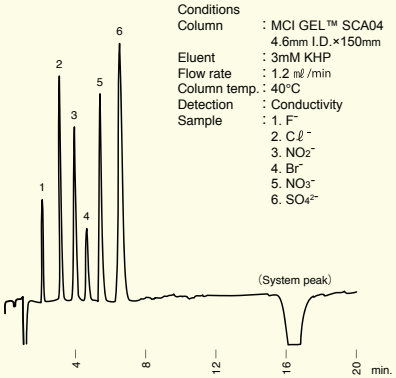
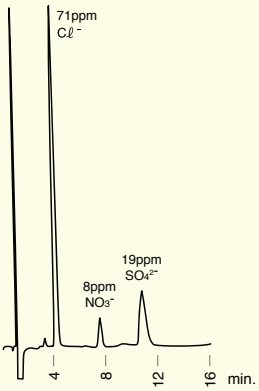
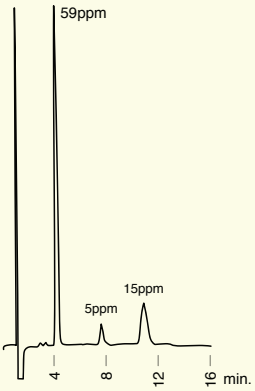


Fig. 3-13 Rain

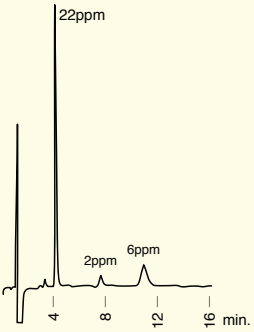
A; Beginning of rain fall



B; After 4 hours

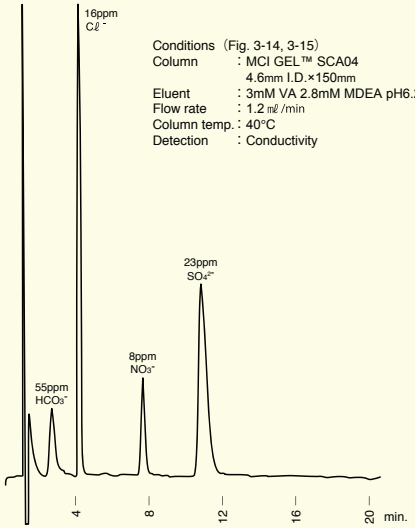


C; After 38 hours



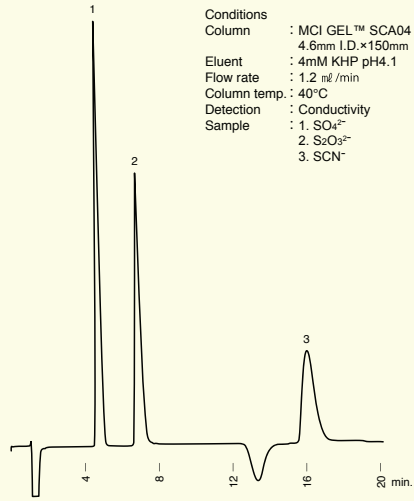
Application data of SCA04

Fig. 3-14 River water



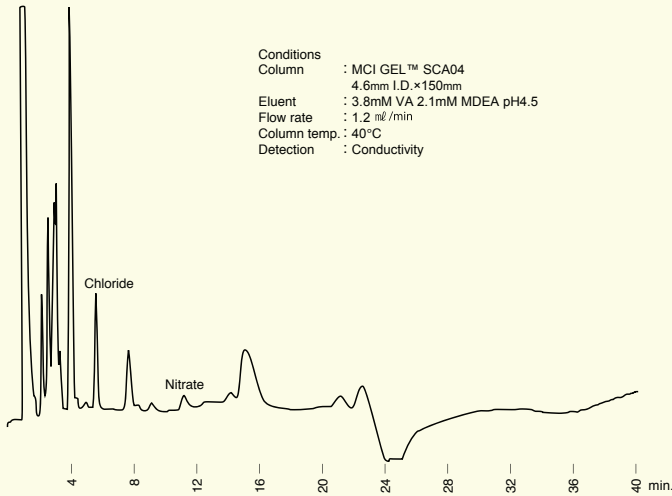
Conditions (Fig. 3-14, 3-15)
Column : MCI GEL™ SCA04
4.6mm I.D.×150mm
Eluent : 3mM VA 2.8mM MDEA pH6.2
Flow rate : 1.2 mℓ/min
Column temp. : 40°C
Detection : Conductivity

Fig. 3-15 Sulfur compounds



Conditions
Column : MCI GEL™ SCA04
4.6mm I.D.×150mm
Eluent : 4mM KHP pH4.1
Flow rate : 1.2 mℓ/min
Column temp. : 40°C
Detection : Conductivity
Sample : 1. SO_4^{2-}
2. $S_2O_3^{2-}$
3. SCN^-

Fig. 3-16 Instant coffee



Conditions
Column : MCI GEL™ SCA04
4.6mm I.D.×150mm
Eluent : 3.8mM VA 2.1mM MDEA pH4.5
Flow rate : 1.2 mℓ/min
Column temp. : 40°C
Detection : Conductivity