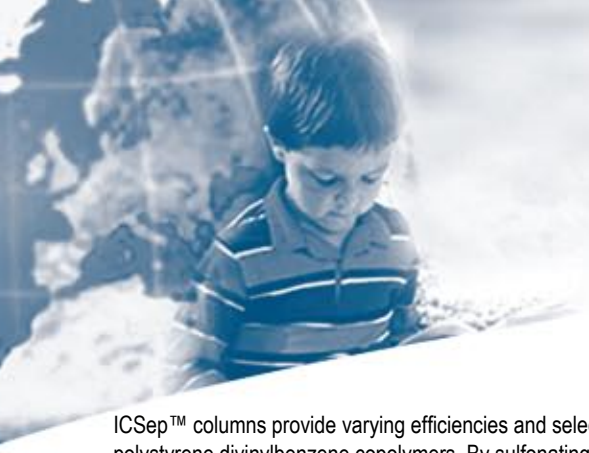


ICSep™ columns provide varying efficiencies and selectivities for the separation of weak acids by ion exclusion. Packings employed with ion exclusion are totally sulfonated polystyrene divinylbenzene copolymers. By sulfonating the polymer, the bead behaves as though it were a negatively charged sphere.
Species that have a negative charge are repelled from from the media while uncharged species are allowed to enter the sphere and adsorb onto the beads. The mobile phases are usually low concentration acids such as sulfuric acid.

Selectivity chart for ion exclusion columns

Compound	Coregel 87H at 85°C	Coregel 64H at 65°C	ION-300 at 65°C	ORH-801 at 45°C
Acetic acid	13.8 min	15.0 min	14.9 min	10.4 min
Acetoacetic acid	nd	nd	nd	10.2 min
Aconitic acid	8.6 min	9.8 min	10.7 min	7.2 min
Acrylic acid	15.9 min	17.7 min	17.9 min	13.1 min
Adipic acid	12.5 min	15.1 min	15.8 min	11.6 min
Butanol	32.9 min	35.1 min	25.2 min	18.4 min
Butyric acid	18.4 min	21.0 min	20.8 min	15.2 min
Citraconic acid	10.1 min	11.0 min	11.5 min	nd
Citric acid	7.5 min	8.0 min	8.6 min	5.5 min
Ethanol	21.4 min	21.7 min	20.6 min	14.6 min
Formic acid	12.9 min	13.8 min	13.9 min	9.6 min
Fumaric acid	11.5 min	13.4 min	14.7 min	10.0 min
2-Furoic acid	22.1 min	26.9 min	29.0 min	22.0 min
Glucoronic acid	nd	nd	nd	5.3 min
Glycolic acid	11.4 min	13.0 min	12.9 min	8.5 min
Glycoxylic acid	9.2 min	9.7 min	10.3 min	6.5 min
Hydroxybutyric acid	12.8 min	14.0 min	14.1 min	9.5 min
Isobutyric acid	17.3 min	19.6 min	19.5 min	14.0 min
Itaconic acid	11.1 min	12.8 min	13.4 min	9.1 min
Keto-butyric acid	nd	nd	11.4 min	7.4 min
Keto-glutaric	7.8 min	8.2 min	nd	5.6 min
Keto-valeric acid	11.7 min	12.6 min	13.1 min	8.6 min
Lactic acid	11.9 min	12.9 min	11.6 min	8.7 min
Maleic acid	8.2 min	8.6 min	9.0 min	5.9 min
Malic acid	8.8 min	9.6 min	10.3 min	6.6 min
Malonic acid	9.3 min	10.0 min	10.7 min	6.9 min
Methanol	18.7 min	19.0 min	18.7 min	12.9 min
Methylglutaric acid	11.8 min	13.9 min	14.5 min	10.0 min
Methylsuccinic acid	10.9 min	12.5 min	13.0 min	8.8 min
Oxalic acid	6.7 min	6.6 min	nd	4.5 min
Propanol	25.9 min	26.7 min	22.2 min	16.1 min
Propionic acid	15.8 min	17.4 min	17.4 min	12.3 min
Pyruvic acid	9.2 min	9.5 min	9.9 min	6.3 min
Quinic acid	9.4 min	10.3 min	11.4 min	6.9 min
Shikimic acid	10.5 min	11.8 min	12.9 min	8.2 min
Succinic acid	10.4 min	11.7 min	12.2 min	8.2 min
Tartaric acid	8.0 min	8.6 min	9.5 min	5.9 min

Flow rate : 0.6 ml/min
nd : no data

ICSep™ Coregel 87H (hydrogen form)

Description	P/N
Column 300 x 7.8 mm	ICE-99-9861
Column 100 x 7.8 mm	ICE-99-5861
20 mm guard cart kit (1 holder and 2 cartridges)	ICE-99-2361
Replacement guard cartridge 20 x 4 mm (2 units)	ICE-99-2371

ICSep™ Ion 107H (hydrogen form)

- 10% cross-linked polymer for efficient acid analysis

Description	P/N
Column 300 x 7.8 mm	ICE-99-9866
Guard holder 20 mm	AXC-99-1300
Replacement guard cartridge 20 x 4 mm (2 units)	ICE-99-2366

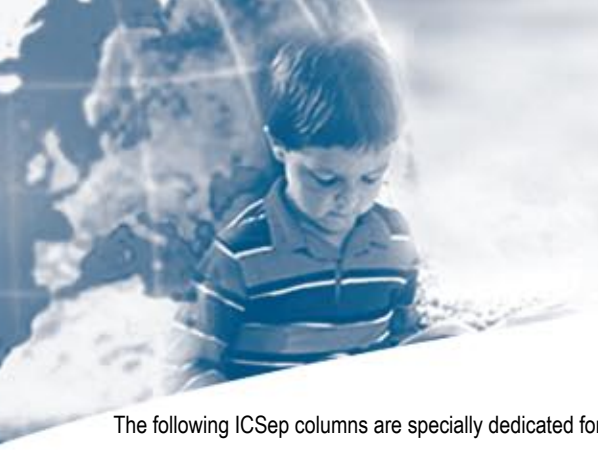
CARBOSep™ Coregel 64H (hydrogen form)

Description	P/N
Column 300 x 7.8 mm	ICE-99-9860
20 mm guard cart kit (1 holder and 2 cartridges)	ICE-99-2360
Replacement guard cartridge 20 x 4 mm (2 units)	ICE-99-2370

ICSep™ Coregel USP L17 (hydrogen form)

- Complies with USP L-17 specifications for the separation of citric, lactic, and acetic acid
- Separates a wide number of other organic acids

Description	P/N
Column 240 x 4.1 mm	ICE-99-8461



The following ICSep columns are specially dedicated for sugars and sugar-alcohols in fruit juices.

ICSep™ Ion 300

- Ideal for Krebs cycle acid analysis

Description	P/N
Column 300 x 7.8 mm	**ICE-99-9850**

ICSep™ Ion 310

- Acid and alcohol rapid analysis

Description	P/N
Column 150 x 6.5 mm	**ICE-99-7752**

ICSep™ WA1

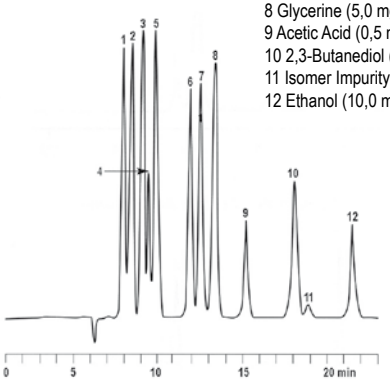
- Acid and sugar analysis in wine

Description	P/N
Column 300 x 7.8 mm	**ICE-99-9810**
20 mm guard cart kit (1 holder and 2 cartridges)	**ICE-99-3510**
Replacement guard cartridge 20 x 4 mm (2 units)	**ICE-99-1310**

Wine Analysis WA-1

Eluent : 0.0025 N Sulfuric Acid
Flow rate : 6 ml /min
T° : 45°C
Detector : RI
Injection : 20µl

Sample :
1 Citric Acid (0,5 mg/ml)
2 Tartaric Acid (2,0 mg/ml)
3 Glucose (2,0 mg/ml)
4 Malic Acid (1,0 mg/ml)
5 Fructose (2,0 mg/ml)
6 Succinic Acid (0,5 mg/ml)
7 Lactic Acid (2,0 mg/ml)
8 Glycerine (5,0 mg/ml)
9 Acetic Acid (0,5 mg/ml)
10 2,3-Butanediol (0,5 mg/ml)
11 Isomer Impurity
12 Ethanol (10,0 mg/ml)



ICSep™ columns

The resins used for anion and cation exchange chromatography in IC employ a functionalized, macroporous polystyrene divynil benzene polymer. Resins functionalized with quaternaly alkyl or alkynol ammonium groups are used with hydroxide or carbonate-based eluents for anion exchange. Resins functionalized with sulfonic acid or carboxylic acid groups are used with acidic eluents for cation exchange.
IC columns have been designed to be compatible with the main part of Ion chromatography systems. They are an excellent alternative to columns which meet the EPA methods requirements.

ICSep™ AN300 (anion exchange)

- Designed for EPA 300 method
- Peek harware

Description	Dimension	P/N
Column AN 300	150 x 5.5 mm	**ANX-99-7613**
Guard cartridges /3u	10 x 3.0 mm	**ANX-99-0010**
Guard holder	10 mm	**ANX-99-0050**

ICSep™ AN2 (anion exchange)

- High capacity

Description	Dimension	P/N
Column AN 2	250 x 4.6 mm	**ANX-99-8515**
Guard cartridges /3u	10 x 3.0 mm	**ANX-99-0015**
Guard holder	10 mm	**ANX-99-0050**

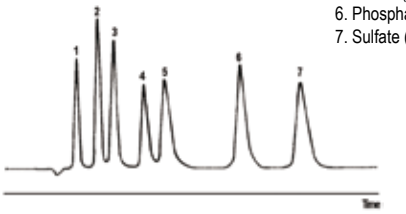
ICSep™ CN2 (cation exchange)

Description	Dimension	P/N
Column CN2	100 x 3.2 mm	**CTX-99-5250**
Column CN2	50 x 4.6 mm	**CTX-99-3550**
Guard cartridges / 2u	10 x 3.0 mm	**CTX-99-1350**

Inorganic anions EPA 300.0 method

AN 300, PEEK : 150 x 5.5 mm
Eluent : 1.7 mM $NaHCO_3$ 1,8 mM Na_2CO_3
Detector : Suppressed conductivity
Sample volume : 20 µl
Flow rate : 2.0 ml /min
T° : Ambient
Pressure : 500 psi

Samples :
1. Fluorure (2 ppm)
2. Chlorure (20 ppm)
3. Nitrite (2 ppm)
4. Bromure (2 ppm)
5. Nitrate (10 ppm)
6. Phosphate (2 ppm)
7. Sulfate (60 ppm)



Transgenomic column	Application
ICSep AN300	F^-, Cl^-, NO_2^-, Br^-, $NO3^-$, HPO_4^{2-}, SO_4^{2-} By E.P.A. Method 300.0(a)
ICSep AN1	F^-, Cl^-, NO_2^-, Br^-, $NO3^-$, HPO_4^{2-}, SO_4^{2-}, Low molecular weight, Organic acids in medium to high ionic strength matrices Cr(III), Cr(VI) as CrO_3^-, CrO_4^{2-}
ICSep ANSC	Polyvalent Phosphates, Arsenates, Sulfite Selenate, Arsenite, Selenite, F^-, Cl^-, NO_2^-, Br^-, $NO3^-$, HPO_4^{2-}, SO_4^{2-}, Low molecular weight, Organic acids
ICSep AN1SC	F^-, Cl^-, NO_2^-, Br^-, $NO3^-$, HPO_4^{2-}, SO_4^{2-}, Low molecular weight, Organic acids in medium to high ionic strength matrices
ICSep AN2	Arsenate, Sulfite, Selenate, Arsenite, Selenite F^-, Cl^-, NO_2^-, Br^-, $NO3^-$, HPO_4^{2-}, SO_4^{2-}, Low molecular weight Organic acids
ICSep AN300B	F^-, Cl^-, NO_2^-, Br^-, $NO3^-$, HPO_4^{2-}, SO_4^{2-}, ClO_2^-, ClO_3^-, BrO_3^-
ICSep CN2	Li^+, Na^+, K^+, Rb^+, Cs^+, Mg^{2+}, Ca^{2+}, NH^{4+}, Cu^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Cd^{2+}, Pb^{2+}, Mn^{2+}, Fe^{2+}, Fe^{3+}