BIOSOLVE
Because You need Quality!

Solvents and Formulations for Liquid Chromatography

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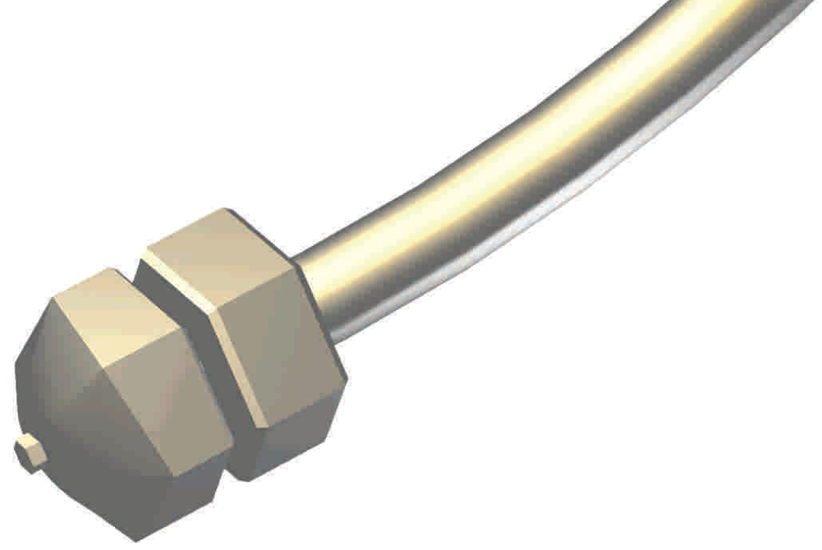


- HPLC Grade
- LC/MS Grade
- ULC/MS Grade

For over three decades, Bio-Lab Ltd, an ISO 9001 and ISO 14001 company, has been producing high purity solvents, reagents and formulations which are distributed through its subsidiary, Biosolve in Benelux, France and Germany.

Quality assurance means the world to us. Our QA policy is expressed from the initial acceptance of the selected raw material through the in process control to the professionally analyzed finished products. All steps of production are perfectly documented and traceable, and final distillations are performed in all-glass equipment ensuring high quality chemicals with lot-to-lot reproducibility. Certificates of analysis and compliance (COA and COC) are available on request, even for long past delivered products.

Continuous training of our personnel, and upgrading manufacturing and laboratory operative procedures will continue to lead us towards both our goals: highest quality and environmental care.

Thanks to constant effort in R&D, we were able to put on the market over the years exceptionally high quality products resulting in guaranteed and often unique specifications. It also has been our task to adapt the specifications of selected solvents and formulations to the customer's particular use. We can offer you a full range of solvents, reagents and formulations that are considered the best available products on the LC and LC/MS market.

Thanks to constant effort in R&D, we were able to put on the market over the years exceptionally high quality products resulting in guaranteed and often unique specifications.

HPLC Grade

In high performance liquid chromatography the intrinsic quality of the solvents is of the greatest significance. We have been optimizing our HPLC grades to match many LC applications, enabling you to determine which is the best grade for your specific need.

Gradient grade HPLC solvents are specified with the gradient elution tests for the highest peak and drift at critical wavelengths in order to demonstrate the peak-free baseline. This enables you to make a better evaluation of minor impurities assuring optimum sensitivity.

Biosolve HPLC solvents are lot-to-lot analyzed to meet the high quality specifications for HPLC separations. We control the low levels of peak impurities, residue, water, acidity and alkalinity, the high chemical purity and the UV transmittance, all of which are critical parameters for a successful HPLC application.

All our HPLC solvents are filtered through 0.2 µm membranes, insuring particle-free mobile phases, and are bottled under inert gas for improved shelf life.

We control the low levels of peak impurities, residue, water, acidity and alkalinity, the high chemical purity and the UV transmittance, all of which are critical parameters for a successful HPLC application.

HPLC Grade

HPLC Solvents, Reagents and Formulations

Product	Assay min. %	UV Transmit--tance nm/min.T%	Water (KF) max. %	Residue on evap. max. %	Acidity (as AcOH or HCl) max. %	Cat. No.
Acetic Acid	99.8	254 / 25 260 / 80	0.05	0.001		010706
Acetone	99.9	335 / 60 340 / 85 350 / 98	0.2	0.0005	0.002	010306
Acetonitrile Supra-Gradient	99.97	191 / 30 195 / 85 200 / 97 220 / 98 230 / 99	0.01	0.0001	0.001	012035
Acetonitrile HPLC-S (gradient grade)	99.95	193 / 60 195 / 80 200 / 95 220 / 98 254 / 99	0.02	0.0002	0.002	012007
Acetonitrile-R (Isocratic)	99.9	195 / 72 200 / 92 230 / 97 240 / 98	0.05	0.0004	0.002	012013
Acetonitrile preparative	99.9	200 / 75 205 / 80 210 / 85 230 / 95	0.03	0.0002	0.0015	012031
Buffer A : Triethylammonium acetate 1.0M in Water	9.5-10.5mM	254 / 97 270 / 97				210006
Buffer B : Triethylammonium acetate, 0.1M in Water/Acetonitrile 75:25	9.5-10.5mM	254 / 97 270 / 97				210106
Buffer C : Water/Acetonitrile 92:8		195 / 90 200 / 95 210 / 97 220 / 99				212606
Buffer D : Water/Acetonitrile 25:75		195 / 68 200 / 90 210 / 95 220 / 98				212706
n-Butane sulfonic acid, Na	99	0.005M in Water: 200 / 70 220 / 90 250 / 98	2			022181
n-Butanol	99.8	210 / 20 230 / 70 270 / 90 310 / 98	0.05	0.0005	0.002	022006
t-Butyl methyl ether	99.5	250 / 60 260 / 90 280 / 98	0.02	0.0002	0.002	138906
Carbon tetrachloride	99.8	270 / 50 280 / 80 290 / 98	0.02	0.001	0.001 (HCl)	032006
1-Chlorobutane	99.7	230 / 70 240 / 90 260 / 96	0.01	0.0005	0.001 (HCl)	030906
Chloroform stab. Amylene	99.9	255 / 70 260 / 85 280 / 98	0.01	0.0005	0.001 (HCl)	030806
Chloroform stab. Ethanol	99.9	255 / 70 260 / 85 280 / 98	0.05	0.0005	0.001 (HCl)	034806
Cyclohexane	99.8	210 / 20 220 / 50 230 / 78 250 / 98	0.01	0.0002	0.002	031306

HPLC Solvents, Reagents and Formulations

Product	Assay min. %	UV Transmit--tance nm/min.T%	Water (KF) max. %	Residue on evap. max. %	Acidity (as AcOH or HCl) max. %	Cat. No.
Dichloroethane	99.9	230 / 20 240 / 80 280 / 99	0.03	0.0003	0.002 (HCl)	040506
Dichloromethane stab. Amylene	99.9	235 / 40 240 / 78 245 / 90 260 / 99	0.01	0.0003	0.001 (HCl)	137906
Dichloromethane stab. Ethanol	99.9	235 / 40 240 / 78 245 / 90 260 / 99	0.02	0.0003	0.001 (HCl)	138006
Diethylether	99.8	220 / 15 230 / 60 250 / 85 270 / 95	0.03	0.0005	0.001	052806
Diisopropylether	99.8	254 / 40 280 / 80	0.01	0.001	0.002	044006
N,N-Dimethylacetamide	99.8	270 / 10 300 / 80 330 / 98	0.03	0.002		042006
N,N-Dimethylformamide	99.8	270 / 30 275 / 60 300 / 90 320 / 97	0.03	0.0005	0.003	041906
Dimethylsulfoxide	99.9	263 / 10 270 / 40 290 / 66 310 / 95 350 / 98	0.05	0.0005		044706
1,4-Dioxane	99.8	220 / 20 240 / 40 280 / 90 300 / 98	0.02	0.0005	0.002	042406
Ethanol absolute	99.9	210 / 35 240 / 85 260 / 98	0.1	0.0005	0.002	052506
Ethyl acetate	99.9	260 / 75 275 / 95 300 / 98	0.05	0.0005	0.003	054006
n-Heptane 99%	99	200 / 25 210 / 50 220 / 82 250 / 99	0.01	0.0003	0.002	080706
n-Heptane	96	200 / 20 210 / 45 220 / 80 250 / 98	0.01	0.0005	0.002	080506
n-Heptane sulfonic acid, Na	99	0.005M in Water: 200 / 70 220 / 90 250 / 98	2			080881
Hexafluoroisopropanol	99.8	195 / 100 200 / 98 240 / 98	0.02			083306
n-Hexane 99%	99	200 / 25 210 / 50 220 / 85 245 / 99	0.005	0.0003	0.002	080906
n-Hexane HPLC- S	96	195 / 12 200 / 35 210 / 60 217 / 80	0.005	0.0002	0.002	082907

HPLC Solvents, Reagents and Formulations

Product	Assay min. %	UV Transmit--tance nm/min.T%	Water (KF) max. %	Residue on evap. max. %	Acidity (as AcOH or HCl) max. %	Cat. No.
n-Hexane	96	200 / 25 210 / 50 220 / 85 245 / 99	0.005	0.0003	0.002	082906
n-Hexane sulfonic acid, Na	99	0.005M in Water: 200 / 70 220 / 90 250 / 98	2			082881
Isohexane (C6 isomers)	99	210 / 55 220 / 80 230 / 95 260 / 99	0.005	0.0002	0.002	091406
Isooctane	99.5	210 / 30 225 / 85 235 / 90 270 / 98	0.01	0.0003	0.002	091506
Octane sulfonic acid, Na	99	0.005M in Water: 200 / 70 220 / 90 250 / 98	2			152781
Methanol Supra-Gradient	99.95	210 / 40 235 / 85 260 / 98	0.03	0.0002	0.002	136835
Methanol	99.9	210 / 30 235 / 85 260 / 98	0.05	0.0003	0.002	136806
n-Pentane 99%	99	200 / 50 220 / 90 270 / 99	0.005	0.0002	0.002	167606
n-Pentane	96	200 / 45 220 / 90 270 / 99	0.005	0.0003	0.002	160506
n-Pentane sulfonic acid, Na	99	0.005M in Water: 200 / 70 220 / 90 250 / 98	2			160481
Petroleum ether 40-60 deg.		210 / 10 220 / 75 270 / 98	0.005	0.0003	0.002	171506
n-Propane sulfonic acid, Na	99	0.005M in Water: 200 / 70 220 / 90 250 / 98				164681
1-Propanol	99.8	230 / 60 240 / 80 270 / 98.5	0.05	0.0003	0.003	163606
2-Propanol	99.8	210 / 30 230 / 80 270 / 99	0.05	0.0005	0.002	162606
Pyridine	99.8	310 / 65 320 / 85 340 / 98	0.03	0.0005		162506
Tetrahydrofuran HPLC - Plus	99.8	230 / 30 270 / 88 310 / 99	0.03	0.0001	0.003	202289
Tetrahydrofuran HPLC-S	99.9	230 / 35 254 / 70 280 / 95 300 / 98	0.02	0.0002	0.002	202207
Tetrahydrofuran unstab.	99.8	230 / 30 270 / 88 310 / 99	0.03	0.0003	0.003	202206

HPLC Solvents, Reagents and Formulations

Product	Assay min. %	UV Transmit--tance nm/min.T%	Water (KF) max. %	Residue on evap. max. %	Acidity (as AcOH or HCl) max. %	Cat. No.
stab./BHT Tetramethylammonium Hydrogen sulfate	99	0.005M in Water: 200 / 70 220 / 89	0.5			205906
Toluene	99.8	292 / 60 300 / 80 350 / 98	0.01	0.0003	0.003	201506
Trichlorotrifluoroethane	99.9	240 / 45 245 / 85 260 / 98	0.01	0.0003	0.001 (HCl)	061806
Triethylamine	99.6	0.1M in Water: 250 / 10 254 / 75	0.1	0.001		204106
Triethylammonium acetate 2.0M pH7	1.9-2.1M	254 / 70 270 / 85		0.001		204206
Trifluoroacetic acid	99.95	260 / 15 280 / 90 300 / 95	0.02	0.002		202306
Water	18MΩ/cm	Gradient elution test: Abs. max 210nm 5mAU; 254: 1mAU		0.0002	0.0002	232106

LC/MS Grade

Mass spectrometers work by ionizing molecules, and then sorting and identifying the ions according to their mass-to-charge (m/z) ratios. Common atmospheric pressure ionization techniques are:

- Electrospray ionization (ESI)
- Atmospheric pressure chemical ionization (APCI)
- Atmospheric pressure photoionization (APPI)

These instruments have two key components: the ion source, which generates the ions, and the mass analyzer, which sorts the ions. Much of the advancement in LC/MS over the last decade has been in the development of ion sources and techniques that ionize the analyte molecules and separate the resulting ions from the mobile phase.

When ionization occurs in the presence of Alkali metal, some components are susceptible to form adducts or clusters that may mask the true molecular MH+ ions.

To avoid such misleading phenomena, it is important to use solvents containing minimum concentrations of such metal ions. Moreover, impurities arising from the solvents may mask low levels of target ion molecules, which will result in faulty interpretation of the chromatograms.

Biosolve LC/MS solvents are manufactured specifically to meet the needs of modern LC/MS instruments, checked and guaranteed to contain low levels of contaminants and ionic background. Specific UV tests and gradient elution control are also guaranteed to ensure reproducibility.

All LC/MS solvents are filtered through 0.2 µm, insuring particle-free mobile phases and are bottled under inert gas for improved shelf life.

Biosolve LC/MS solvents are manufactured specifically to meet the needs of modern LC/MS instruments, checked and guaranteed to contain low levels of contaminants and ionic background. Specific UV tests and gradient elution control are also guaranteed to ensure reproducibility.

LC/MS Grade

LC/MS Solvents & formulations

Product	Assay / Purity min. %	HPLC-gradient H. Peak at nm/max.AU	Residue on evap. max. %	Water (KF) max. %	UV Transmittance nm/min.T%	Ionic Metals max. ppm	Cat. No.
Acetonitrile	99.95	210 / 0.005 254 / 0.002	0.0001	0.02	195 / 78 200 / 95 220 / 98 240 / 99	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	012078
Methanol	99.95	235 / 0.002 254 / 0.001	0.0003	0.03	210 / 40 220 / 60 235 / 85 260 / 98	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	136878
2-Propanol	99.95	235 / 0.002 254 / 0.001	0.0005	0.05	210 / 40 220 / 80 235 / 90 250 / 98	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	162678
Water	> 18.0 MΩ/cm	210 / 0.003 254 / 0.001	0.0002	TOC max. 10 ppb	All range/100	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	232178
Acetic acid 0.1% in Acetonitrile	99.9	254 / 0.002		0.02	210 / 20 230 / 50 254 / 98	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	019178
Acetic Acid 0.1% in Water	99.9	254 / 0.002			210 / 20 230 / 75 254 / 99	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	232378
Formic acid 0.1% in Acetonitrile	99	254 / 0.002		0.02	210 / 5 230 / 15 254 / 90	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	019378
Formic acid 0.1% in Water	99	254 / 0.002			210 / 5 230 / 45 254 / 99	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	232478
Trifluoroacetic acid 0.1% in Acetonitrile	99.9	254 / 0.002		0.02	210 / 20 230 / 50 254 / 90	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	019578
Trifluoroacetic acid 0.1% in Water	99.9	254 / 0.002			210 / 25 230 / 85 254 / 99	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	232778
Trifluoroacetic acid 0.1% in Methanol	99.9	254 / 0.002		0.03	210 / 5 230 / 35 254 / 90	Ca / 0.1 K / 0.1 Mg / 0.1 Na / 0.1	136778

ULC/MS Grade

Recent improvements on the High and Ultra PLC instruments, coupled with sensitive MS, PDA, ELSD, CAD, etc. detectors, have led to special high-performing systems. Ultra low detection limits and valid analysis of molecular structures of proteins, peptides, oligonucleotides and other chemicals brought these new techniques a growing popularity, especially in the pharmaceutical and biotechnology industry.
Some minor impurities arising from the solvents may interfere with low levels of sample impurities, or give false peaks, which will result in inadequate interpretation of the chromatograms.
Biosolve Ultra Liquid Chromatography / Mass Spectrometry solvents (ULC/MS) for high resolution and sensitivity were developed in close cooperation with advanced instrument companies to meet these new requirements.

Biosolve ULC/MS solvents are checked and guaranteed to meet the demand for:
High chemical purity, high UV transmission, lowest peak impurities and drift in the gradient elution tests to ensure reproducibility, low fluorescence impurities and low level of ionic background of less than 100 ppb of Alkali metal.

For routine work, we also offer ready-made ULC/MS formulations, such as: Trifluoracetic acid, Formic acid, Acetic acid and Ammonium acetate in Water, Acetonitrile and Methanol mixtures. These additives are used to improve chromatographic peak shape and to optimize ionization in the MS interface.
Ultra pure salts and acids are also available for mobile phase preparation. We are ready to offer our help in tailor-made formulations to conform to your specific needs.

Biosolve ULC/MS solvents and formulations are micro filtered at 0.1 µm, and have a very low residue on evaporation, offering the best protection for your columns and detectors. All ULC/MS reagents are packed under inert gas for improved shelf life.

High chemical purity, high UV transmission, lowest peak impurities and drift in the gradient elution tests to ensure reproducibility.
Low fluorescence impurities and low level of ionic background of less than 100 ppb of Alkali metal.

ULC/MS Grade

ULC/MS Solvents

Product	Assay min. %	Fluorescence nm/max. ppb	HPLC-gradient Drift at nm/max.AU	HPLC-gradient H. Peak at nm/max.AU	Residue on evap. max. %	Water (KF) max. %	UV Transmittance nm/min.T%	Ionic Metals max. ppb	Cat. No.
Acetonitrile	99.97	254 / 0.3 365 / 0.3	210 / 0.006 254 / 0.002	210 / 0.0010 254 / 0.0003	0.0001	0.01	191 / 30 195 / 85 200 / 97 215 / 98 230 / 99	Al / 20 Ca / 50 Fe / 20 K / 50 Mg / 20 Na / 100	012041
Methanol	99.98	254 / 0.5 365 / 0.3	220 / 0.010 235 / 0.005	220 / 0.004 235 / 0.002	0.0001	0.03	210 / 40 220 / 65 230 / 80 260 / 98	Al / 20 Ca / 50 Fe / 20 K / 100 Mg / 20 Na / 100	136841
2-Propanol	99.95	254 / 1.0 365 / 1.0	235 / 0.010 254 / 0.005	235 / 0.001 254 / 0.002	0.0001	0.03	220 / 80 230 / 90 250 / 98	Al / 20 Ca / 100 Fe / 20 K / 50 Mg / 20 Na / 100	162641
Water	> 18.2 MΩ/cm	254 / 0.5 365 / 0.5	210 / 0.010 254 / 0.005	210 / 0.0020 254 / 0.0005	0.0001	TOC max. 10 ppb	All range /100	Al / 20 Ca / 50 Fe / 20 K / 100 Mg / 20 Na / 100	232141

ULC/MS Formulations

Product	Purity min. %	Fluorescence nm/max. ppb	HPLC-gradient Drift at nm/max.AU	HPLC-gradient H. Peak at nm/max.AU	Water (KF) max. %	UV Transmittance nm/min.T%	Ionic Metals max. ppb	Cat. No.
Acetic acid 0.1% in Acetonitrile	99.95	254 / 0.5 365 / 0.5	254 / 0.010	254 / 0.002	0.02	210 / 20 230 / 50 254 / 98	Al / 30 Ca / 100 Fe / 50 K / 100 Mg / 30 Na / 100	019141
Acetic Acid 0.1% in Water	99.95	254 / 0.5 365 / 0.5	254 / 0.010	254 / 0.002		210 / 20 230 / 75 254 / 99	Al / 30 Ca / 100 Fe / 50 K / 100 Mg / 30 Na / 100	232341
Formic acid 0.1% in Acetonitrile	99.0	254 / 0.5 365 / 0.5	254 / 0.030	254 / 0.002	0.02	210 / 5 230 / 15 254 / 90	Al / 30 Ca / 100 Fe / 50 K / 100 Mg / 30 Na / 100	019341
Formic acid 0.1% in Water	99.0	254 / 0.5 365 / 0.5	254 / 0.010	254 / 0.002		210 / 5 230 / 45 254 / 99	Al / 30 Ca / 100 Fe / 50 K / 100 Mg / 30 Na / 100	232441
Trifluoroacetic acid 0.1% in Acetonitrile	99.95	254 / 0.5 365 / 0.5	254 / 0.030	254 / 0.002	0.02	210 / 20 230 / 50 254 / 90	Al / 30 Ca / 100 Fe / 50 K / 100 Mg / 30 Na / 100	019541
Trifluoroacetic acid 0.1% in Water	99.95	254 / 0.5 365 / 0.5	254 / 0.010	254 / 0.002		210 / 25 230 / 85 254 / 99	Al / 30 Ca / 100 Fe / 50 K / 100 Mg / 30 Na / 100	232741

ULC/MS Acids & Salts

Product	Assay min. %	Fluorescence nm/max. ppb	HPLC-gradient Drift at nm/max.AU	HPLC-gradient H. Peak at nm/max.AU	Water (KF) max. %	UV Transmittance nm/min.T%	Ionic Metals max. ppm	Cat. No.
Acetic acid glacial	99.95	0.1% in Water: 254 / 0.5 365 / 0.5	254 / 0.005	254 / 0.002	0.05	254 / 30 260 / 80 265 / 95 275 / 98	Al / 0.01 Ca / 0.05 Fe / 0.02 K / 0.02 Mg / 0.01 Na / 0.05	010741
Trifluoroacetic acid	99.95	25% in Water: 254 / 1.0 365 / 1.0	254 / 0.010	254 / 0.002	0.02	260 / 10 270 / 79 280 / 93 300 / 95 320 / 96	Al / 0.05 Ca / 0.2 Fe / 0.3 K / 0.1 Mg / 0.05 Na / 0.5	202341
Formic Acid	99.0	0.1% in Water: 254 / 0.5 365 / 0.5	254 / 0.010	254 / 0.002	1	260 / 15 270 / 83 280 / 90 300 / 97 320 / 98	Al / 0.05 Ca / 0.2 Fe / 0.2 K / 0.1 Mg / 0.05 Na / 0.5	069141
Ammonium Acetate	99.0	0.1% in Water: 254 / 0.5 365 / 0.5	254 / 0.010	*254 / 0.002	1	1M in Water: 260 / 96 280 / 98	Al / 1 Ca / 5 Fe / 1 K / 5 Mg / 1 Na / 5	012441
Ammonium Formate	99.0	0.1% in Water: 254 / 0.5 365 / 0.5	254 / 0.010	*254 / 0.002	2	1M in Water: 260 / 98 280 / 98	Al / 1 Ca / 5 Fe / 1 K / 5 Mg / 1 Na / 5	019841

Water ULC/MS

Biosolve early recognized the importance of Water for sophisticated LC and LC-MS applications.

Minor impurities present in the water often "charge" the LC columns at the early stage of the gradient chromatographic run.

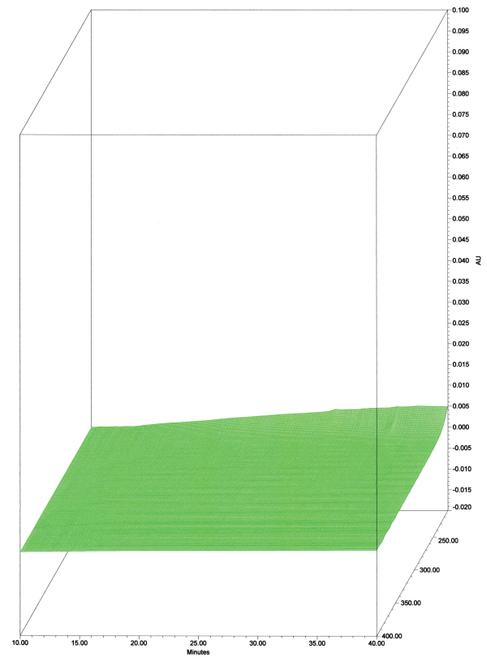
Such impurities may then be released as single or multiple peaks with rising gradient conditions.

The operator may then consider the presence of such peak(s) as impurity(ies) that are present in the mobile phase co-solvent (e.g. Acetonitrile, Methanol) or inherent to the analyzed sample.

Over the years, the Water quality at Biosolve has been constantly upgraded and at present, our Water ULC/MS is produced by not less than 11 monitored purification steps, including short UV treatment and final filtration through 0.1 µm membranes.

Our bottles are selected and treated to minimize ion release from the internal glass surface. The filling is performed under aseptic conditions.

HPLC Gradient elution 3D chromatogram from 210nm to 400nm.
Acetonitrile ULC/MS batch #548581 and Water ULC/MS batch #589711.



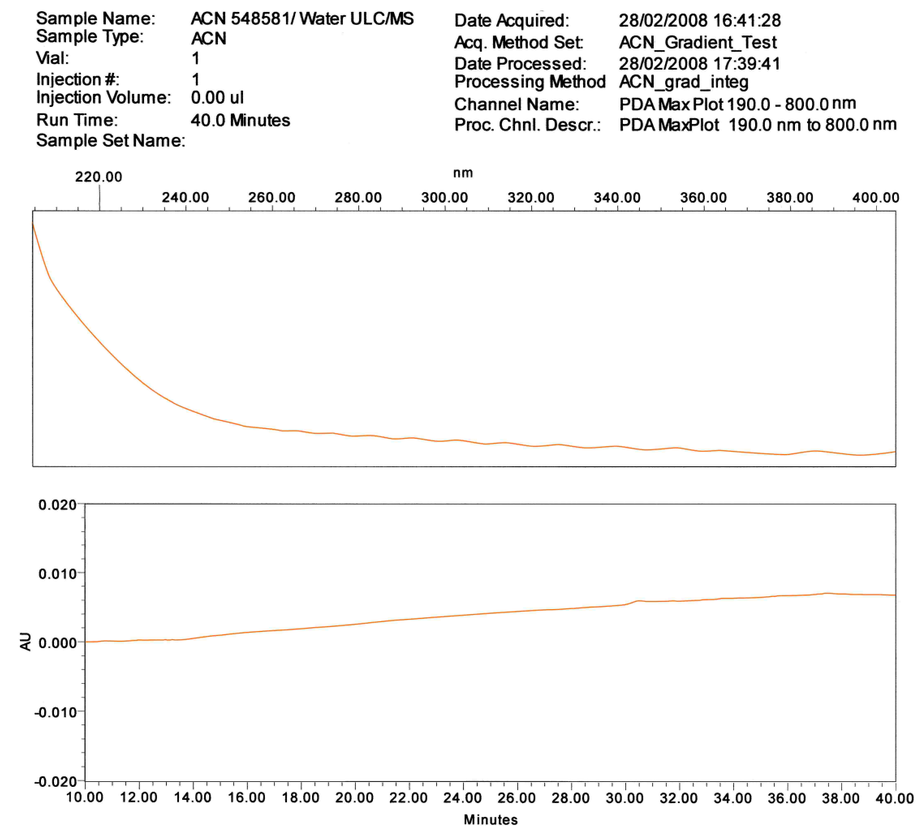
System parameters:

Column RP-18 spherical 5µm, 254x4.6mm, PDA 2998 detector.

Gradient elution test parameters:

- Loading of 100% ACN for 5 min.
- Back program to 5% ACN in 2 min.
- Column equilibrium for 3 min.
- Gradient elution from 5% to 100% ACN in 20 min.
- Hold at 100% ACN for 10 min

PDA max plot gradient chromatogram from 210nm to 400nm. Acetonitrile ULC/MS batch #548581 and Water ULC/MS batch #589711.



*For complete information on product specifications and standard packaging, please refer to our internet website at: www.Biosolve-chemicals.com.