Scharlau

HPLC
Solvents & Reagents

Presentation

Scharlau has been proud to serve the HPLC community since 1982. Our HPLC solvents, from isocratic to ultra-gradient grade, have been renowned for their high purity and consistent quality.

Scharlau's HPLC range has evolved in the same way as HPLC science has moved to more specific and sensitive detection systems. The development of new detectors provides users with the capability to obtain more and better information about the samples, but at the same time means they have to use purer solvents to prepare the mobile phases.

You will find a complete NEW line of LC/MS products in this catalogue.

LC-MS has experienced significant advances in the last decade and is now, a powerful technique used in pharmaceutical development, proteomics, genomics, organic trace analysis and in many other research applications. We have developed a specific LC/MS solvent quality to fulfil the requirements of this technique. Our new LC/MS solvents combine gradient-grade specifications with suitability for MS interfaces. The LC/MS range also includes new mobile phase blends typically used in LC/MS analysis of biomolecules.
At this point, we would especially like to thank a number of customers who have helped us with their valuable opinions to develop the new LC/MS product line.

Finally, the last few pages of this publication contain practical information for new HPLC users that will help them achieve greater familiarity with chromatography.

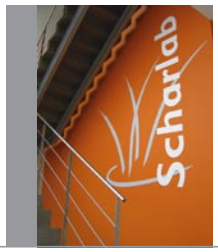
Working to become your preferred supplier,

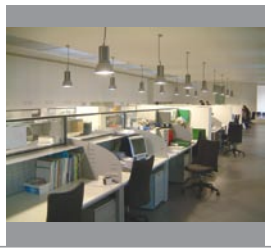
Scharlau Chemie S.A.

Contact us however you like

1. Directly. A staff of 11 personnel in our CCT (Customer Care Team) group are available to answer any questions you might have about products, services, orders and queries. You can contact them by e-mail, fax or phone at our new offices:

Tel. +34 93 745 64 26
Fax +34 93 715 27 65
E-mail: export@scharlau.com
Post: Gato Pérez, 33
Pol. Ind. Mas d'en Cisa
08181 Sentmenat
BARCELONA, SPAIN





2. Through our distributors in any of the following countries:

Albania
Algeria
Angola
Argentina
Australia
Austria
Bahrain
Baltic Republics
Bangladesh
Barbados
Belgium
Benin
Bolivia
Bosnia & Herzegovina
Botswana
Brunei
Bulgaria
Caledonia
Chad
Chile
China P.R.
Colombia
Costa Rica
Côte d'Ivoire
Croatia
Cuba
Cyprus
Czech Republic
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
Estonia
Ethiopia
Finland
France
French Polynesia
Germany
Ghana
Greece
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Haiti
Hong Kong
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Palestine
Panama
Peru
Philippines
Poland
Portugal
Qatar
Reunion Island
Rumania
Russia
Rwanda
Saudi Arabia
Senegal
Singapore
Slovakia
Slovenia
South Africa
Sri-Lanka
Sudan
Sultanate of Oman
Sweden
Switzerland
Syria
Taiwan
Tanzania
Thailand
The Netherlands
Togo
Tonga
Trinidad & Tobago
Tunisia
Turkey
Uganda
Ukraine
United Arab Emirates
United Kingdom
United States
Venezuela
Vietnam
Yemen
Yugoslavia
Zambia
Zimbabwe

3. At any time, you can have a look at our catalogues and news and place your orders through the Internet on our web sites:

www.scharlab.com
www.scharlau.com

Both sites are linked. In **www.scharlab.com** you will find all information about our complete business product range, including all our chemicals and any consumables or instrumentation used in the analytical laboratory.
www.scharlau.com contains all information related to the chemicals and culture media we manufacture (on-line catalogue, literature, MSDS and CoA).

Quality

Our raw materials are carefully selected, so that purification can be performed to comply with the most stringent specifications.
High-efficiency distillation, solid-phase absorption and other chemical treatments are used to remove impurities that could interfere in HPLC analysis.
Quality control is intensively carried out. Samples are taken and analysed at every step of the purification process. Ultraviolet spectroscopy, gradient HPLC and Karl Fischer titration are routinely used in our controls. Specific QC tests are also performed on LC/MS solvents and blends to assure suitability for this technique.
Solvents are micro-filtered and bottled under inert gas atmosphere in amber glass bottles. Caps are fitted with PTFE liners to prevent contamination.
Once the whole batch is bottled, our QC staff choose random bottles and test them again to assure the quality of bottling conditions.
The result is the highest purity product with low UV absorption, low water and low reactive impurities content as well as lot-to-lot consistency and reproducibility.
Scharlau Chemie has been certified as compliant with ISO 9001: 2000 and ISO 14001: 2004.


CERTIFICATE

Scharlau Chemie S.A.

ISO 9001: 2000
ISO 14001: 2004

NEW LC/MS Solvents and blends

LC/MS is a powerful analytical technique because it combines the separation done in HPLC and the structure information obtained from a mass spectrometer. This hyphenated technique is becoming a must in the identification and quantification of peptides, oligonucleotides and metabolites in life science and pharmaceutical laboratories.

There are different LC/MS system configurations having different ionisation interfaces that eliminate the solvent and generate gas phase ions. The quality of this process is affected by the purity of the solvents used.

LC/MS solvents must be free of impurities that could react in APCI (Atmospheric Pressure Chemical Ionisation), generating large quantities of ions that would be added to the background. Even in ESI (Electrospray Ionisation), trace impurities can be added to the background.

When performing quantitative analysis, the presence of interfering compounds might alter the results due to ion suppression.

In addition, particulates must be effectively removed by filtration through 0,22µm. Otherwise, they could clog small narrow-bore columns.

The content of alkali ions is also a critical issue because they could form clusters during molecular ion generation and interfere in the mass spectra.

Using LC/MS-grade solvent is highly recommended to avoid all these adverse effects.

LC/MS products

DESCRIPTION	ART. NR.
Acetonitrile, LC-MS	AC0371
Acetonitrile with 0,1% acetic acid, LC-MS	AC0374
Acetonitrile with 0,1% formic acid, LC-MS	AC0373
Acetonitrile with 0,1% trifluoroacetic acid, LC-MS	AC0372
Ammonium acetate, solution 10mmol/l in water, buffered at pH = 7, LC-MS	AM0262
Ethyl acetate, LC-MS	AC0158
Formic acid, solution 10% in water, for cleaning purposes, LC-MS	AC1075
Methanol, LC-MS	ME0326
Methanol with 0,1% acetic acid, LC-MS	ME0329
Methanol with 0,1% ammonium acetate, LC-MS	ME0330
Methanol with 0,1% trifluoroacetic acid, LC-MS	ME0327
Mixture 2-propanol/water, 50/50 (v/v) for cleaning purposes, LC-MS	ME0797
2-Propanol, LC-MS	AL0326
Water, LC-MS	AG0006
Water with 0,1% acetic acid, LC-MS	AG0009
Water with 0,1% ammonium acetate, LC-MS	AG0010
Water with 0,1% formic acid, LC-MS	AG0008
Water with 0,1% trifluoroacetic acid, LC-MS	AG0007

NEW LC/MS Solvents and blends

LC/MS is widely used in proteomics. In this application, usually, 0,1% of an organic acid is added to both water and organic solvent. The acid is used to improve the chromatographic peak shape and to provide a source of protons in reverse phase LC/MS. Sulphuric, hydrochloric and strong inorganic acids may damage the instrument. These acids are replaced by volatile organic acids like formic acid, trifluoroacetic acid and acetic acid. Heptafluorobutyric acid is also sometimes used.

Sulphonic acids, which are used in ion pair chromatography, are not suitable in LC/MS. Because of their high boiling points, they could clog the electrospray.

Phosphate buffers suppress MS ionisation and should also be avoided.

DESCRIPTION	ART. NR.
Acetic acid glacial, HPLC grade	AC0346
Heptafluorobutiric acid 99,5%	AC1235
Trifluoroacetic acid, buffer substance, HPLC grade	AC3143

LC/MS INTERFACES

Most applications are now done with these two API (Atmospheric Pressure Ionisation) interfaces:

ELECTROSPRAY (ESI)

Electrospray is the most widely used API technique for the analysis of polar and ionic compounds. It can be performed in positive or negative mode. The compound of interest is ionised in solution. Using an electrospray probe, the liquid sample stream is sprayed and a strong electric field is applied. The analytes are ionised and then desolvated with the assistance of high-temperature gas flow to produce gas phase ions.

Mobile phases used with ESI must have an appropriate pH so that analytes will be ionised. Buffers used to adjust the pH of mobile phases should be volatile and be present at low concentrations to avoid competition effects.

ESI is the technique of choice to analyse proteins and biopolymers.

ATMOSPHERIC PRESSURE CHEMICAL IONISATION (APCI)

APCI provides ionisation capabilities for less polar and neutral chemical species. With APCI, solvent and analytes are volatilised and submitted to a corona discharge. The eluent vapour is ionised and reacts chemically with the analyte molecules in the gas phase to transform them into charged ions.

It is also possible to work in positive or negative mode.

Mobile phases used in APCI must be suitable for ionisation and for gas phase acid-base reactions. Buffers must be volatile.

Water gradient grade

Water is one of the key solvents in reverse-phase gradient HPLC.

Using a non-appropriate water quality could be an important source of problems in HPLC.

Organic impurities present in water decrease the baseline quality and reduce column lifetime. At high ppb levels, these impurities introduce ghost peaks and affect the identification and quantification of trace components.

Ionic impurities could change the stationary phase selectivity affecting the separation.

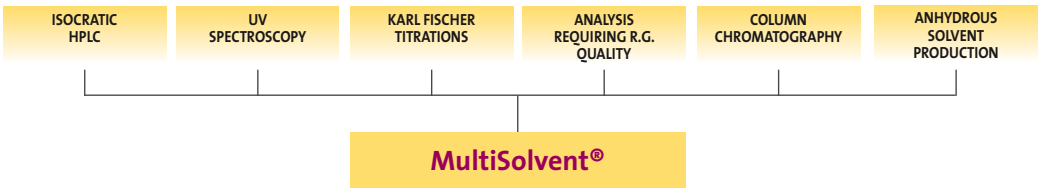
Our HPLC water purification technology involves treatment with activated carbon, deionisation, reverse osmosis, UV photo-oxidation and micro-filtration. After purification, the resistivity and TOC are monitored and a gradient elution test is performed to ensure the suitability for HPLC.

Water is also used in the preparation of HPLC buffers. Since most buffers are good media for bacterial growth, freshly prepared solutions should always be used to help prevent column clogging.

MultiSolvent® One solvent. Many applications

Isocratic HPLC is the most important application of Multisolvent® but not the only one. In recent years, our customers have found Multisolvent® useful for many applications. Here are some of them:

MultiSolvent® applications



Analysis. We guarantee our Multisolvent® as "reagent-grade" quality. This means, that our products meet the specifications of the ACS (American Chemical Society) for "Reagent Chemicals". In actual fact, our solvents exceed these specifications by far, since the ACS mentions only the maximum level of impurities allowed.
The actual content of each product is tested by means of an GC chromatogram (FID detector), printed on the label. These guarantees make our Multisolvent® an ideal solvent for analytical procedures.

HPLC. Probably the most widely used detector in HPLC is the UV detector. Our Multisolvent® products are controlled by a UV spectrophotometer, to insure adequate UV transmissions for HPLC purposes. Multisolvent® is ideal for isocratic HPLC techniques. There's no need to worry about time-consuming microfiltration. Our solvents come free from pump-damaging particles.

UV. Multisolvent® products are checked with a scanning UV-VIS spectrophotometer. The spectrum is printed on the label as proof of suitability.

Karl Fischer. Although not a "dry" product, the low water content in Multisolvent® makes it suitable for routine Karl Fischer titrations at a very competitive price. In the case of methanol, the water content of our Multisolvent® (typically below 0,03%) is much lower than what is specified by the ACS (max. 0,1% water) for Karl Fischer reagents.

Column chromatography. This separation technique is routinely used in organic chemistry to purify synthesised molecules. The solvent used to develop the column must be pure enough to assure clean NMR spectra after total evaporation.

Anhydrous solvent production. Multisolvent® has a very low water content and is ideal for use as a starting solvent in the production of anhydrous solvents. Regardless of whether thermal distillation or pressure column technologies are used to obtain anhydrous solvents, solvents with a low water content should be used.

DESCRIPTION	ART. NR.
Acetone, Multisolvent® HPLC grade ACS ISO UV-VIS	AC0310
Acetonitrile, Multisolvent® HPLC grade ACS UV-VIS	AC0333
Benzene, Multisolvent® HPLC grade ACS ISO UV-VIS	BE0041
Chloroform, stabilized with ethanol, Multisolvent® HPLC grade ACS ISO UV-VIS	CL0218
Cyclohexane, Multisolvent® HPLC grade ACS ISO UV-VIS	CI0039
Dichloromethane, stabilized with approx. 50 ppm of amylene, Multisolvent® HPLC grade ACS ISO UV-VIS	CL0347
N,N-Dimethylformamide, Multisolvent® HPLC grade ACS ISO UV-VIS	DI1072
Ethanol absolute, Multisolvent® HPLC grade ACS ISO UV-VIS	ET0015
Ethanol 96% v/v, Multisolvent HPLC grade ACS UV-VIS	ET0013
Ethyl acetate Multisolvent® HPLC grade ACS ISO UV-VIS	ET0155
n-Hexane, 96%, Multisolvent® HPLC grade ACS UV-VIS	HE0234
Hexane, fraction from petroleum, Multisolvent® HPLC grade ACS	HE0221
Methanol, Multisolvent® HPLC grade ACS ISO UV-VIS K.F.	ME0315
Petroleum ether, boiling range 40-60°C, Multisolvent® HPLC grade ACS ISO UV-VIS	ET0095
2-Propanol, Multisolvent® HPLC grade ACS ISO UV-VIS	AL0321
Tetrahydrofuran, Multisolvent® GPC grade ACS, stabilized with 250 ppm of 2,6-Di-tert-butyl-4-methylphenol (BHT)	TE0228
Toluene, Multisolvent® HPLC grade ACS ISO UV-VIS	TO0085

Ion pair reagents and HPLC reagents

Ion pair reagents

The separation of ionic or polar molecules using a reverse phase chromatography system is affected by the polar interactions between the analyte and the stationary phase.

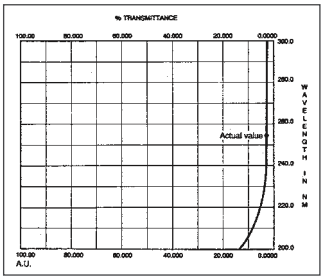
Ion suppression was the first mechanism used to avoid undesirable polar interactions. It consists of changing the mobile phase pH to have the analytes in non-ionised form. This is not always possible. When mixtures of compounds having very different pKa are analysed or when the required pH exceeds the range where the silica is stable, ion suppression cannot be used.

Ion pairing is a more interesting approach. Ion pair reagents are large ionic molecules having a hydrophobic part able to interact with the long chain alkyl groups of the stationary phase, as well as a charge opposite to the analyte of interest. When the ion pair reagent is added to the mobile phase, it combines with the analyte counter-ion and a neutral species is formed. Then, an optimum reverse phase separation is achieved.

Basic compounds need anionic ion pair reagents. Alkanesulphonic acids are typically used.

Acid compounds need cationic ion pair reagents. Quaternary ammonium or phosphonium salts are usually used.

AC1246



Ion pair reagents from Scharlau have a specially low UV absorption.

DESCRIPTION	ART. NR.
1-Butane sulfonic acid, sodium salt, HPLC grade	AC0601
1-Decane sulfonic acid, sodium salt, HPLC grade	AC0801
1-Heptane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade	AC1240
1-Heptane sulfonic acid, sodium salt monohydrate, HPLC grade	AC1242
1-Hexane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade	AC1245
1-Hexane sulfonic acid, sodium salt, monohydrate, HPLC grade	AC1247
1-Octane sufonic acid, sodium salt, solution 0,1 mol/l, HPLC grade	AC1700
1-Octane sulfonic acid, sodium salt, monohydrate, HPLC grade	AC1702
1-Pentane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade	AC1740
1-Pentane sulfonic acid, sodium salt monohydrate, HPLC grade	AC1745

DESCRIPTION	ART. NR.
n-Dodecyltrimethylammonium bromide, HPLC grade	BR0180
Hexadecyltrimethylammonium bromide, HPLC grade	BR0170
Tetrabutylammonium bromide, HPLC grade	BR0200
Tetrabutylammonium chloride, HPLC grade	TE0118
Tetrabutylammonium hydrogen sulfate, for ion pair chromatography	TE0120
Tetrabutylammonium iodide, HPLC grade	TE0130

HPLC reagents

Our HPLC-grade salts contain no UV-absorbing impurities. We guarantee the absence of particles in the solutions by means of a filtering test.

DESCRIPTION	ART. NR.
Ammonium acetate, HPLC grade	AM0255
Ammonium carbonate, HPLC grade	AM0267
Potassium dihydrogen phosphate, HPLC grade	PO0261
di-Potassium hydrogen phosphate trihydrate, HPLC grade	PO0270
Sodium acetate trihydrate, HPLC grade	SO0030
Sodium hydrogen carbonate, HPLC grade	SO0130
Sodium formate, HPLC grade	SO0325
di-Sodium hydrogen phosphate dihydrate, HPLC grade	SO0345
Sodium lauryl sulfate, for ion-pair chromatography	SO0456

Containers and packaging

Containers

We take extra care with the quality of our containers to adequately maintain the quality of our products.

In the case of HPLC solvents, the most appropriate materials for containers are glass (or steel) since they produce no leaching of UV-absorbing organic impurities into the solvents.

Single-use containers

1l, 2,5l and 4l amber glass bottles with GL 45 thread, compatible with most HPLC equipment. 4l bottles manufactured in Europe, stronger and more robust than standard American 4l bottles.

Returnable containers

To help minimise laboratory waste, we offer our clients the possibility of purchasing HPLC solvents in returnable steel containers.

7l steel containers
Same GL 45 thread as glass bottles, allowing the use of the same metering units or caps for analytical instruments (HPLC, titrators, etc.). Easy-to-use and equipped with a metal handle and obviously safer than a glass bottle. Space-saver compared to three 2,5l bottles. Suitable for storage of all liquids compatible with steel in any quality.

25l safety tank
Blow resistant and equipped with several additional safety components: davy mesh, aeration valve and safety valve cap. In case of fire, flames cannot penetrate the tank, preventing explosion. Specially recommended for the storage of flammable liquids such as hexane, acetone and ether. Once inside company premises, the cap is exchanged for a self-closing steel valve that allows the tank to be emptied in horizontal position. Equipped with metal ring for easier handling and stacking.

185l steel tank
185l returnable steel containers for high consumption levels in preparatory HPLC. Pressurisable to 5 bar, with solvent extraction by positive-pressure dispensing system with nitrogen or other inert gas.

The availability of 4l bottles and returnable containers may vary from country to country. Please consult our authorised distributors.

Packaging

100% cardboard packaging materials used for both the outer case and the filler, which is recycled cardboard. Biodegradability is the main advantage, although by no means the only one. It is a highly absorbent material, reducing the danger in the event of a liquid spill due to bottle breakage.

All Scharlau containers and packing materials are UN-approved for the storage and transport of dangerous goods.

Symbols and capacity of our main containers

CAPACITY	MATERIAL	SYMBOL
1 l	Glass	
2,5 l	Glass	
4 l	Glass	
7 l	Steel	
25 l	Safety Steel	
185 l	Steel	

Accessories


1


2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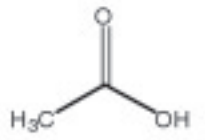
9

	DESCRIPTION	UNITS	ART. NR.
1	Positive pressure extraction system for 7l steel containers	Unit	028-0EK07S
2	Positive pressure extraction system for steel containers (for connection to pipe with inert gas)	Unit	649-000006
3	Self-closing valve for 25l safety tank	Unit	113-GR7040
4	25l tank holder	Unit	232-SOPBID
5	25l desktop tank holder	Unit	232-SOPSOB
6	HPLC cap with 2 holes and special Teflon disc for bottles of reagents with a GL 45 mouth	Unit	033-00TDOS
7	Bottle opening wrench	Unit	055-LLAVEF
8	Vent cap w/washer for 25l safety tank	Unit	113-TAP25S
9	Threaded cap for 25l safety tank	Unit	113-GR7041

Acetic acid glacial



Methane carboxylic acid, Methylformic acid

- CH_3COOH • M = 60,05 g/mol
- CAS [64-19-7]
- EC number: 200-580-7

Physical data:
- Density: 1,05 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: 17 °C
- Boiling point: 117 °C
- Flash point: 38 °C
- Ignition temp.: 485 °C
- Vapour pressure: (20 °C) 15,4 hPa
- Refraction index: (20 °C) 1,37
- Expl. limit (upper): 19,9 Vol%
- Expl. limit (lower): 4 Vol%
- pH (50 g/l H_2O, 20 °C) 2,5

Toxicological data:
- LD 50 (oral, rat): 3310 mg/kg
- MAK: 10 ml/m³, 25 mg/m³
- WGK: 1

Safety:
- EC Index no.: 607-002-00-6
- R: 10-35
- S: 23.2-51-26-36/37/39-45
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 8 CF1 II UN 2789
- IMDG: 8 II UN 2789
- IATA/ICAO: 8 II UN 2789
- PAX: 809
- CAO: 813
- LGK: 3A
- Disposal: 4

AC0346 Acetic acid glacial, HPLC grade

Taric code: 2915 21 00 00

assay (acidimetric)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,048 - 1,050
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,2 %

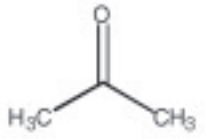
Microfiltered through membranes of pore diameter 0,22 µm

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
260 nm	80 %	0,097 AU
270 nm	95 %	0,022 AU
280 nm	98 %	0,009 AU

Code	Capacity
AC03461000	1 l
AC03462500	2,5 l

Acetone



Dimethyl ketone, 2-Propanone

- C_3H_6O • M = 58,08 g/mol
- CAS [67-64-1]
- EC number: 200-662-2

Physical data:
- Density: 0,79 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -95 °C
- Boiling point: 56 °C
- Flash point: < -20 °C
- Ignition temp.: 540 °C
- Vapour pressure: (20 °C) 233 hPa
- Refraction index: (n 20 °C/D) 1,35858
- Viscosity: (25 °C) 0,31 mPas
- Dipolar moment: (20 °C) 2,7 Debye
- Dielectric const.: (25 °C) 20,7
- Evap. heat: (56 °C) 521 KJ/kg
- Saturation conc.: (20 °C) 533 g/m³
- Expl. limit (upper): 13 Vol%
- Expl. limit (lower): 2,6 Vol%
- pH (395 g/l H_2O, 20 °C) 5 - 6

Toxicological data:
- LD 50 (oral, rat): 5800 mg/kg
- MAK: 500 ml/m³, 1200 mg/m³
- WGK: 1

Safety:
- EC Index no.: 606-001-00-8
- R: 11-36-66-67
- S: 9-16-26
- VbF class: B
- Poison class CH (Swiss): 5

Transport/storage:
- ADR: 3 F1 II UN 1090
- IMDG: 3 II UN 1090
- IATA/ICAO: 3 II UN 1090
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

AC0310 Acetone, Multisolvent® HPLC grade ACS ISO UV-VIS

Taric code: 2914 11 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,787 - 0,791
appearance of solution	passes test
colour (Hazen)	max. 10
solubility in water	passes test
water-insoluble substances	passes test
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
chlorides (Cl)	max. 0,00001 %
nitrates (NO_3)	max. 0,00001 %
phosphates (PO_4)	max. 0,00001 %
sulfates (SO_4)	max. 0,00001 %
aluminium (Al)	max. 0,00001 %
antimony (Sb)	max. 0,000002 %
arsenic (As)	max. 0,000002 %
barium (Ba)	max. 0,000001 %
beryllium (Be)	max. 0,000002 %
bismuth (Bi)	max. 0,000002 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000001 %
gallium (Ga)	max. 0,000002 %
germanium (Ge)	max. 0,000002 %
gold (Au)	max. 0,000002 %
indium (In)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,000001 %
lithium (Li)	max. 0,000005 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
molybdenum (Mo)	max. 0,000002 %
nickel (Ni)	max. 0,000001 %
silver (Ag)	max. 0,000002 %
thallium (Th)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
titanium (Ti)	max. 0,000002 %
vanadium (V)	max. 0,000002 %
zinc (Zn)	max. 0,000001 %
zirconium (Zr)	max. 0,000002 %
aldehydes (as HCHO)	max. 0,002 %
cyclohexane (G.C.)	max. 0,1 %
diacetone (G.C.)	max. 0,02 %
ethanol (G.C.)	max. 0,01 %
methanol (G.C.)	max. 0,05 %
2-propanol (G.C.)	max. 0,05 %
$KMnO_4$ red. matter (as O)	max. 0,0001 %
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,2 %

liquid chromatography suitability

absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
330 nm	10 %	1,000 AU
335 nm	50 %	0,301 AU
337 nm	80 %	0,097 AU
342 nm	90 %	0,046 AU
350 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03101000	1 l
AC03102500	2,5 l
AC03104000	4 l
AC0310007E	7 l
AC0310025S	25 l

Acetonitrile

F Xn

Methyl cyanide, Cyanomethane

- CH_3CN • M = 41,05 g/mol
- CAS [75-05-8]
- EC number: 200-835-2

Physical data:
- Density: 0,786 g/cm³
- Solub. in water (20 ºC): miscible
- Melting point: -45,7 ºC
- Boiling point: 81,6 ºC
- Flash point: 5 ºC
- Ignition temp.: 524 ºC
- Vapour pressure: (20 ºC) 97 hPa
- Refraction index: (n 20 ºC) 1,3442
- Viscosity: (20 ºC) 0,39 mPas
- Dipolar moment: (20 ºC) 3,44 Debye
- Dielectric const.: (20 ºC) 37,5
- Evap. heat: (81 ºC) 833 KJ/kg
- Saturation conc.: (20 ºC) 163 g/m³
- Expl. limit (upper): 17 Vol%
- Expl. limit (lower): 3,0 Vol%

Toxicological data:
- LD 50 (oral, rat): 2730 - 3800 mg/kg
- MAK: 20 ml/m³ , 34 mg/m³
- WGK: 2

Safety:
- EC Index no.: 608-001-00-3
- R: 11-20/21/22-36
- S: 16-36/37-46
- VbF class: B
- Poison class CH (Swiss): 2

Transport/storage:
- ADR: 3 F1 II UN 1648
- IMDG: 3 II UN 1648
- IATA/ICAO: 3 II UN 1648
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

AC0333 Acetonitrile, Multisolvent® HPLC grade ACS UV-VIS

Tanic code: 2926 90 95 90

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,779 - 0,783
appearance	clear
colour (Hazen)	max. 10
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0001 meq/g
cyanides (CN)	max. 0,005 %
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,03 %
liquid chromatography suitability	
absorbance	passes test
gradient elution	passes test
min. transmission/max. absorbance	
in a 1,0 cm cell at	
wavelength:	T(%) A (AU)
190 nm	10 % 1,000 AU
195 nm	50 % 0,301 AU
200 nm	80 % 0,097 AU
215 nm	90 % 0,046 AU
230 nm	98 % 0,009 AU
Microfiltered through membranes	
of pore diameter 0,22 µm	

Code	Capacity
AC03331000	1 l
AC03332500	2,5 l
AC03334000	4 l
AC0333007E	7 l
AC0333025S	25 l

NEW AC0371 Acetonitrile, LC-MS

Tanic code: 2926 90 95 90

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,779 - 0,783
acidity	max. 0,0002 meq/g
aluminium (Al)	max. 0,00005 %
barium (Ba)	max. 0,00001 %
cadmium (Cd)	max. 0,000005 %
calcium (Ca)	max. 0,00001 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,00001 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000002 %
nickel (Ni)	max. 0,000002 %
potassium (K)	max. 0,00001 %
silver (Ag)	max. 0,00001 %
sodium (Na)	max. 0,00001 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,00001 %
non-volatile matter	max. 0,0001 %
water (K.F.)	max. 0,01 %
suitability for use in LC-MS	passes test
min. transmission/max. absorbance	
in a 1,0 cm cell at	
wavelength:	T(%) A (AU)
195 nm	80 % 0,097 AU
200 nm	95 % 0,022 AU
210 nm	97 % 0,013 AU
220 nm	98 % 0,009 AU
gradient grade (210 nm)	
maximum background absorbance	max. 0,012 AU
maximum peak absorbance	max. 0,001 AU
gradient grade (254 nm)	
maximum peak absorbance	max. 0,0002 AU
microfiltered through membranes	
of pore diameter 0,22 µm	

Code	Capacity
AC03711000	1 l
AC03712500	2,5 l

AC0335 Acetonitrile, fluorescence HPLC grade

Tanic code: 2926 90 95 90

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,779 - 0,783
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0001 %
water (K.F.)	max. 0,02 %
min. transmission/max. absorbance	
in a 1,0 cm cell at	
wavelength:	T(%) A (AU)
195 nm	83 % 0,081 AU
200 nm	96 % 0,018 AU
215 nm	98 % 0,009 AU
230 nm	99 % 0,004 AU
gradient grade (210 nm)	
maximum background absorbance	0,01 AU
maximum peak absorbance	0,0015 AU
fluorescence analysis:	
maximum absorbance: 1 ppb as quinine	
(in 0,1 N sulfuric acid), for the spectra	
recorded at the following conditions:	
EX wavelength between 200 and 450	
EM wavelength between 250 and 550	
Microfiltered through membranes	
of pore diameter 0,22 µm	

Code	Capacity
AC03351000	1 l
AC03352500	2,5 l

AC0331 Acetonitrile, supragradient HPLC grade

Taric code: 2926 90 95 90

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,779 - 0,783
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0001 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
195 nm	80 %	0,097 AU
200 nm	95 %	0,022 AU
210 nm	97 %	0,013 AU
220 nm	98 %	0,009 AU

gradient grade (210 nm)	
maximum background absorbance:	max. 0,01 AU
maximum peak absorbance:	max. 0,0015 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03311000	1 l
AC03312500	2,5 l
AC03314000	4 l
AC0331007E	7 l
AC0331025S	25 l

AC0329 Acetonitrile, gradient 240nm/ far UV HPLC grade

Taric code: 2926 90 95 90

assay (G.C.)	min. 99,85 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,779 - 0,783
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,02 %

min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
200 nm	90 %	0,046 AU
205 nm	92 %	0,036 AU
210 nm	95 %	0,022 AU
220 nm	98 %	0,009 AU

gradient grade (240 nm)	
maximum background absorbance:	0,01 AU
maximum peak absorbance:	0,0015 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03291000	1 l
AC03292500	2,5 l
AC03294000	4 l
AC0329007E	7 l
AC0329025S	25 l

AC0340 Acetonitrile, isocratic HPLC grade

Taric code: 2926 90 95 90

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,779 - 0,783
acidity	max. 0,0005 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,03 %

min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
200 nm	50 %	0,301 AU
220 nm	90 %	0,046 AU
240 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03401000	1 l
AC03402500	2,5 l
AC03404000	4 l
AC0340007E	7 l
AC0340025S	25 l

Acetonitrile with 0,1% acetic acid

F Xn

Safety:
- R: 11-20/21/22-36
- S: 16-36/37-46

Transport/storage:
- ADR: 3 F1 II UN 1993
- IMDG: 3 II UN 1993
- IATA/ICAO: 3 II UN 1993

NEW AC0374 Acetonitrile with 0,1% acetic acid, LC-MS

Taric code: 3822 00 00 00

acetic acid content (v/v)	0,093 - 0,107 %
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
210 nm	20 %	0,699 AU
230 nm	50 %	0,301 AU
254 nm	90 %	0,046 AU

microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03741000	1 l
AC03742500	2,5 l

Acetonitrile with 0,1% formic acid

F Xn

Safety:
- R: 11-20/21/22-36
- S: 16-36/37-46

Transport/storage:
- ADR: 3 F1 II UN 1993
- IMDG: 3 II UN 1993
- IATA/ICAO: 3 II UN 1993

NEW AC0373 Acetonitrile with 0,1% formic acid, LC-MS

Taric code: 3822 00 00 00

formic acid content (v/v)	0,093 - 0,107 %
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
210 nm	5 %	1,301 AU
230 nm	15 %	0,824 AU
254 nm	90 %	0,046 AU

gradient grade (254 nm)	
maximum peak absorbance	max. 0,05 AU

microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03731000	1 l
AC03732500	2,5 l

Acetonitrile with 0,1% trifluoroacetic acid

F Xn

Safety:
- R: 11-20/21/22-36
- S: 16-36/37-46

Transport/storage:
- ADR: 3 F1 II UN 1993
- IMDG: 3 II UN 1993
- IATA/ICAO: 3 II UN 1993

NEW AC0372 Acetonitrile with 0,1% trifluoroacetic acid, LC-MS

Taric code: 3822 00 00 00

trifluoroacetic acid content (w/v)	0,093 - 0,107 %
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	30 %	0,523 AU
230 nm	50 %	0,301 AU
254 nm	90 %	0,046 AU

microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AC03721000	1 l
AC03722500	2,5 l

Ammonium acetate

Acetic acid ammonium salt
- CH_3COONH_4 • M = 77,08 g/mol
- CAS [631-61-8]
- EC number: 211-162-9

Physical data:
- Spec. density: 1,17 g/cm³
- Bulk density: ~ 410 kg/m³
- Solub. in water (20 °C): soluble
- Melting point: 114 °C
- Flash point: 135 °C
- pH (50 g/l H_2O, 20 °C) ~ 6,7 - 7,3

Toxicological data:
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 14

AM0255 Ammonium acetate, HPLC grade

Taric code: 2915 29 00 90

assay (acidimetric)	min. 98 %
identity (IR-spectrum)	passes test
insoluble matter	passes test
pH (5%, H_2O)	6,5 - 7,5
chlorides (Cl)	max. 0,0005 %
heavy metals (as Pb)	max. 0,0001 %
iron (Fe)	max. 0,0001 %

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
250 nm	0,05 AU
260 nm	0,04 AU
270 nm	0,03 AU
280 nm	0,02 AU

Code	Capacity
AM02550250	250 g
AM02551000	1 kg

Ammonium acetate, solution 10 mmol/l in water

NEW AM0262 Ammonium acetate, solution 10 mmol/l in water, buffered at pH = 7, LC-MS

Taric code: 2915 29 00 90

ammonium acetate content (mmol/l)	9,5 - 10,5
pH (20° C)	6,95 - 7,05
aluminium (Al)	max. 0,000005 %
calcium (Ca)	max. 0,000005 %
iron (Fe)	max. 0,000005 %
magnesium (Mg)	max. 0,000005 %
potassium (K)	max. 0,000005 %
sodium (Na)	max. 0,000005 %
suitability for use in LC- MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
254 nm	95 %	0,018 AU
280 nm	98 %	0,009 AU

Code	Capacity
AM02621000	1 l

Ammonium carbonate

Xn

Salt of hartshorn
- $(NH_4)_2CO_3$
- CAS [506-87-6]
- EC number: 208-58-0

Physical data:
- Solub. in water (20 °C): soluble
- Melting point: 58 °C (decomposes)
- pH (100 g/l H_2O, 20 °C) 9,4

Toxicological data:
- LD 50 (oral, rat): 1975 mg/kg
- WGK: 1

Safety:
- R: 22
- S: 45
- Poison class CH (Swiss): 4

Transport/storage:
- LGK: 10-13

AM0267 Ammonium carbonate, HPLC grade

Taric code: 2836 10 00 00

assay (acidimetric, NH_3)	min. 30 %
identity	passes test
insoluble matter	passes test
chlorides (Cl)	max. 0,0005 %
sulfates (SO_4)	max. 0,005 %
arsenic (As)	max. 0,0003 %
copper (Cu)	max. 0,0025 %
heavy metals (as Pb)	max. 0,001 %
iron (Fe)	max. 0,0005 %
lead (Pb)	max. 0,001 %

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
240 nm	0,1 AU
250 nm	0,04 AU
260 nm	0,02 AU
280 nm	0,01 AU

Code	Capacity
AM02670250	250 g

Benzene

F T

Cyclohexatriene
- C_6H_6 • M = 78,11 g/mol
- CAS [71-43-2]
- EC number: 200-753-7

Physical data:
- Density: 0,88 g/cm³
- Solub. in water (20 °C): 1,77 g/l
- Melting point: 5,5 °C
- Boiling point: 80,1 °C
- Flash point: -11 °C
- Ignition temp.: 555 °C
- Vapour pressure: (20 °C) 101 hPa
- Refraction index: (n 20 °C/D) 1,5011
- Viscosity: (20 °C) 0,66 mPas
- Dielectric const.: (20 °C) 2,3
- Evap. heat: (80 °C) 550 KJ/kg
- Saturation conc.: (20 °C) 319 g/m³
- Expl. limit (upper): 8,0 Vol%
- Expl. limit (lower): 1,4 Vol%

Toxicological data:
- LD 50 (oral, rat): 930 mg/kg
- WGK: 3

Safety:
- EC Index no.: 601-020-00-8
- R: 45-46-11-36/38-E48/23/24/25-E65
- S: 53-45-60-61
- VbF class: AI
- Poison class CH (Swiss): 1*

Transport/storage:
- ADR: 3 F1 II UN 1114
- IMDG: 3 II UN 1114
- IATA/ICAO: 3 II UN 1114
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 9

BE0041 Benzene, Multisolvent® HPLC grade ACS ISO UV-VIS

Tanic code: 2902 20 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,877 - 0,879
appearance	clear
colour (Hazen)	max. 10
melting point	min. 5,2 °C
acidity	max. 0,00005 meq/g
alkalinity	max. 0,00005 meq/g
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %
sulphur compounds (as S)	max. 0,0005 %
tiophene	max. 0,0001 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,02 %

liquid chromatography suitability

absorbance	passes test

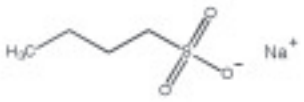
min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
280 nm	25 %	0,602 AU
290 nm	80 %	0,097 AU
320 nm	95 %	0,022 AU
300 nm	90 %	0,046 AU
340 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
BE00411000	1 l
BE00412500	2,5 l
BE00414000	4 l
BE0041007E	7 l
BE0041025S	25 l

1-Butane sulfonic acid, sodium salt



Sodium 1-butylsulfonate
- $C_4H_9NaO_3S$ • M = 160,17 g/mol
- CAS [2386-54-1]
- EC number: 219-201-1

Physical data:
- Solub. in water (20 °C): soluble
- Melting point: > 310 °C

Toxicological data:
- WGK: 3

Transport/storage:
- LGK: 10-13

AC0601 1-Butane sulfonic acid, sodium salt, HPLC grade

Tanic code: 2904 10 00 90

assay (acidimetric)	min. 98 %
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
210 nm	0,1 AU
220 nm	0,06 AU
230 nm	0,04 AU
250 nm	0,02 AU

Code	Capacity
AC09010025	25 g

1-Butanol

Xn

n-Butyl alcohol, Propylcarbinol

- $C_4H_{10}O$ • M = 74,12 g/mol
- CAS [71-36-3]
- EC number: 200-751-6

Physical data:
- Density: 0,81 g/cm³
- Solub. in water (20 °C): 79 g/l
- Melting point: -89,5 °C
- Boiling point: 118 °C
- Flash point: 30 °C
- Ignition temp.: 340 °C
- Vapour pressure: (20 °C) 6,7 hPa
- Refraction index: [n 20 °C/D) 1,3993
- Viscosity: (20 °C) 2,95 mPas
- Dipolar moment: (20 °C) 1,66 Debye
- Dielectric const.: (20 °C) 17,8
- Saturation conc.: (20 °C) 20 g/m³
- Expl. limit (upper): 11,3 Vol%
- Expl. limit (lower): 1,4 Vol%
- pH (70 g/l H_2O, 20 °C) 7

Toxicological data:
- LD 50 (oral, rat): 790 mg/kg
- MAK: 100 ml/m³, 310 mg/m³
- WGK: 1

Safety:
- EC Index no.: 603-004-00-6 [1]
- R: 10-22-37/38-41-67
- S: 7/9-13-26-37/39-46
- VbF class: AII
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 III UN 1120
- IMDG: 3 III UN 1120
- IATA/ICAO: 3 III UN 1120
- PAX: 309
- CAO: 310
- LGK: 3 A
- Disposal: 1

AL0175 1-Butanol, HPLC grade

Tanic code: 2905 13 00 00

assay (G.C.)	min. 99,7 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,809 - 0,810
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,1 %

min. transmission/max. absorbance in a 1,0 cm cell at

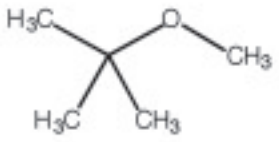
wavelength:	T(%)	A (AU)
210 nm	20 %	0,699 AU
220 nm	50 %	0,301 AU
245 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AL01751000	1 l
AL01752500	2,5 l

tert-Butyl methyl ether

F



Methyl tert-butyl ether, MTBE
- $C_5H_{12}O$ • M = 88,15 g/mol
- CAS [1634-04-4]
- EC number: 216-653-1

Physical data:
- Density: 0,74 g/cm³
- Solub. in water (10 °C): ~ 26 g/l
- Melting point: -108,6 °C
- Boiling point: 55 °C
- Flash point: -28 °C
- Ignition temp.: 460 °C
- Vapour pressure: (20 °C) 268 hPa
- Viscosity: (20 °C) 0,27 mPas
- Evap. heat: (55 °C) 342 KJ/kg
- Expl. limit (upper): 8,4 Vol%
- Expl. limit (lower): 1,65 Vol%

Toxicological data:
- LD 50 (oral, rat): 3870 mg/kg
- MAK: 50 ml/m³, 180 mg/m³
- WGK: 1

Safety:
- R: 11-66
- S: 16-23.2-51-29-33
- VbF class: AI

Transport/storage:
- ADR: 3 F1 II UN 2398
- IMDG: 3 II UN 2398
- IATA/ICAO: 3 II UN 2398
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

ME0552 tert-Butyl methyl ether, HPLC grade

Tanic code: 2909 19 00 90

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,740 - 0,742
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,02 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
240 nm	50 %	0,301 AU
255 nm	80 %	0,097 AU
280 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME05521000	1 l
ME05522500	2,5 l
ME0552007E	7 l

Cyclohexane

F Xn N

Hexahydrobenzene, Hexamethylene, Naphthene
- C_6H_{12} • M = 84,16 g/mol
- CAS [110-82-7]
- EC number: 203-806-2

Physical data:
- Density: 0,78 g/cm³
- Solub. in water (20 °C): 55 mg/l
- Melting point: 6 °C
- Boiling point: 80,7 - 81 °C
- Flash point: -18 °C
- Ignition temp.: 260 °C
- Vapour pressure: (20 °C) 103 hPa
- Refraction index: (n 20 °C/D) 1,4264
- Viscosity: (kinetic, 20 °C) 1,26 mm²/s
- Dielectric const.: (20 °C) 2,0
- Evap. heat: (81 °C) 389 KJ/kg
- Saturation conc.: (20 °C) 357 g/m³
- Expl. limit (upper): 8,3 Vol%
- Expl. limit (lower): 1,2 Vol%

Toxicological data:
- LD 50 (oral, rat): 12705 mg/kg
- MAK: 200 ml/m³, 700 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-017-00-1
- R: 11-38-65-67-50/53
- S: 9-16-25-33-60-61-62
- VbF class: AI
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1145
- IMDG: 3 II UN 1145
- IATA/ICAO: 3 II UN 1145
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

CI0039 Cyclohexane, Multisolvent® HPLC grade ACS ISO UV-VIS

Tanic code: 2902 11 00 00

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,776 - 0,780
appearance	clear
colour (Hazen)	max. 10
melting point	min. 6,0 °C
acidity	max. 0,0003 meq/g
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %

aromatics (as benzene)	max. 0,001 %
cyclohexene (G.C.)	max. 0,05 %
ethanol (G.C.)	max. 0,01 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,01 %

liquid chromatography suitability

absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T[%]	A (AU)
208 nm	20 %	0,699 AU
223 nm	50 %	0,301 AU
232 nm	80 %	0,097 AU
240 nm	90 %	0,046 AU
250 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
CI00391000	1 l
CI00392500	2,5 l
CI00394000	4 l
CI0039007E	7 l
CI0039025S	25 l

1-Chlorobutane

F

n-Butyl chloride, n-Propylcarbinyl chloride
- C_4H_9Cl • M = 92,57 g/mol
- CAS [109-69-3]
- EC number: 203-696-6

Physical data:
- Density: 0,88 g/cm³
- Solub. in water (20 °C): ~ 0,5 g/l
- Melting point: -123 °C
- Boiling point: 78 °C
- Flash point: ~ -17 °C
- Ignition temp.: ~ 280 °C
- Vapour pressure: (20 °C) ~ 110 hPa
- Viscosity: (20 °C) 0,45 mPas
- Expl. limit (upper): 10,1 Vol%
- Expl. limit (lower): 1,8 Vol%

Toxicological data:
- LD 50 (oral, rat): 2670 mg/kg
- WGK: 3*

Safety:
- EC Index no.: 602-059-00-3
- R: 11
- S: 9-16-29
- VbF class: AI
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1127
- IMDG: 3 II UN 1127
- IATA/ICAO: 3 II UN 1127
- PAX: 305
- CAO: 307
- LGK: 3A

CL0120 1-Chlorobutane, HPLC grade

Tanic code: 2903 19 80 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,885 - 0,887
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0001 %
water (K.F.)	max. 0,03 %

min. transmission/max. absorbance in a 1,0 cm cell at

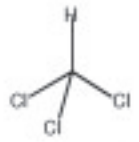
wavelength:	T[%]	A (AU)
225 nm	20 %	0,699 AU
230 nm	50 %	0,301 AU
245 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
CL01201000	1 l
CL01202500	2,5 l

Chloroform

Xn



Trichloromethane, Formyl trichloride
- $CHCl_3$ • M = 119,38 g/mol
- CAS [67-66-3]
- EC number: 200-663-8

Physical data:
- Density: 1,47 g/cm³
- Solub. in water (20 °C): 8 g/l
- Melting point: -63 °C
- Boiling point: 61 °C
- Ignition temp.: 982 °C
- Vapour pressure: (20° C) 213 hPa
- Viscosity: (20 °C) 0,56 mPas
- Dipolar moment: (20 °C) 1,01 Debye
- Dielectric const.: (20 °C) 4,8
- Saturation conc.: (20 °C) 1027 g/m³

Toxicological data:
- LD 50 (oral, rat): 908 mg/kg
- MAK: 0,5 ml/m³ , 2,5 mg/m³
- WGK: 3

Safety:
- EC Index no.: 602-006-00-4
- R: 22-38-40-48/20/22
- S: 36/37-46
- Poison class CH (Swiss): 1*

Transport/storage:
- ADR: 6.1 T1 III UN 1888
- IMDG: 6.1 III UN 1888
- IATA/ICAO: 6.1 III UN 1888
- PAX: 610
- CAO: 612
- LGK: 10-13
- Disposal: 2

CL0218 **Chloroform**, stabilized with ethanol, Multisolvent® HPLC grade ACS ISO UV-VIS

Taric code: 2903 13 00 00

assay (G.C.)	99,0-99,5 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,476 - 1,479
appearance	clear
colour (Hazen)	max. 10
ethanol (G.C.)	0,5 - 1,0 %
free acid (as HCl)	max. 0,0001 %
free chlorine (as Cl)	max. 0,00003 %
chlorides (Cl)	max. 0,00002 %
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,00001 %
boron (B)	max. 0,000001 %
cadmium (Cd)	max. 0,000002 %
calcium (Ca)	max. 0,000001 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000001 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,000001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,00003 %

aldehydes and ketones (as C_3H_6O)	passes test
dichlorometane (G.C.)	max. 0,01 %
carbon tetrachloride (G.C.)	max. 0,01 %
tetrachlorcethylene (G.C.)	max. 0,01 %
trichlorcethylene (G.C.)	max. 0,01 %
suitability for use in dithizone tests	passes test
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,01 %

liquid chromatography suitability

absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
245 nm	20 %	0,699 AU
250 nm	50 %	0,301 AU
265 nm	90 %	0,046 AU
300 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
CL02181000	1 l
CL02182500	2,5 l

CL0207 **Chloroform**, HPLC grade, stabilized with amylene (approx. 150 ppm)

Taric code: 2903 13 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,476 - 1,479
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
248 nm	20 %	0,699 AU
253 nm	50 %	0,301 AU
265 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
CL02071000	1 l
CL02072500	2,5 l

1-Decane sulfonic acid, sodium salt

Sodium 1-decylsulfonate
- $C_{10}H_{21}NaO_3S$ • M = 244,33 g/mol
- CAS [13419-61-9]
- EC number: 236-525-9

Physical data:
- Solub. in water (20 °C): soluble
- Melting point: > 300 °C

Safety:
- S: 24/25

Transport/storage:
- LGK: 10-13

AC0801 **1-Decane sulfonic acid, sodium salt**, HPLC grade

Taric code: 2904 10 00 90

assay (acidimetric)	min. 98 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of an aqueous solution (5%) in a 1,0 cm cell at

wavelength:	absorbance:
210 nm	0,05 AU
220 nm	0,03 AU
230 nm	0,02 AU
260 nm	0,02 AU

Code	Capacity
AC08010025	25 g

1,2-Dichloroethane

F T

Ethylene chloride, Ethylene dichloride
- $C_2H_4Cl_2$ • M = 98,97 g/mol
- CAS [107-06-2]
- EC number: 203-458-1

Physical data:
- Density: 1,25 g/cm³
- Solub. in water (20 °C): 0,80 g/l
- Melting point: -35,5 °C
- Boiling point: 83,5 - 84,1 °C
- Flash point: 13 °C
- Ignition temp.: 412,6 - 440 °C
- Vapour pressure: (20 °C) 87 hPa
- Viscosity: (20 °C) 0,8 mPas
- Saturation conc.: (20°C) 350 g/m³
- Expl. limit (upper): 16,2 Vol%
- Expl. limit (lower): 6 Vol%

Toxicological data:
- LD 50 (oral, rat): 670 mg/kg
- WGK: 3

Safety:
- EC Index no.: 602-012-00-7
- R: 45-11-E22-36/37/38
- S: 53-45
- VbF class: AI
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 3 FT1 II UN 1184
- IMDG: 3 II UN 1184
- IATA/ICAO: 3 II UN 1184
- PAX: 306
- CAO: 308
- LGK: 3 A
- Disposal: 2

DI0409 1,2-Dichloroethane, HPLC grade

Tanic code: 2903 15 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,246 - 1,255
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

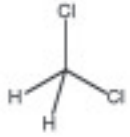
wavelength:	T(%)	A (AU)
230 nm	20 %	0,699 AU
235 nm	50 %	0,301 AU
245 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
DI04091000	1 l
DI04092500	2,5 l

Dichloromethane

Xn



Methylene chloride, Chloromethylene
- CH_2Cl_2 • M = 84,93 g/mol
- CAS [75-09-2]
- EC number: 200-838-9

Physical data:
- Density: 1,32 g/cm³
- Solub. in water (20 °C): 20 g/l
- Melting point: ~ -95 °C
- Boiling point: 40 °C
- Ignition temp.: 605 °C
- Vapour pressure: (20 °C) 475 hPa
- Viscosity: (20 °C) 0,43 mPas
- Dipolar moment: (20 °C) 1,6 Debye
- Dielectric const.: (20 °C) 9,1
- Evap. heat: (40 °C) 329 KJ/kg
- Saturation conc.: (20°C) 1549 g/m³
- Expl. limit (upper): 22 Vol%
- Expl. limit (lower): 13 Vol%
- pH (20 °C) 7

Toxicological data:
- LD 50 (oral, rat): 1600 mg/kg
- MAK: 100 ml/m³, 350 mg/m³
- WGK: 2

Safety:
- EC Index no.: 602-004-00-3
- R: 40
- S: 23.2-51-25-36/37
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 6.1 T1 III UN 1593
- IMDG: 6.1 III UN 1593
- IATA/ICAO: 6.1 III UN 1593
- PAX: 605
- CAO: 612
- LGK: 10-13
- Disposal: 2

CL0347 Dichloromethane, stabilized with approx. 50 ppm of amylene, Multisolvent® HPLC grade ACS ISO UV-VIS

Tanic code: 2903 12 00 00

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,323 - 1,325
appearance	clear
colour (Hazen)	max. 10
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
free chlorine (as Cl)	max. 0,00002 %
chlorides (Cl)	max. 0,0001 %
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %
chloroform (G.C.)	max. 0,005 %
carbon tetrachloride (G.C.)	max. 0,005 %
ethanol (G.C.)	max. 0,02 %
methanol (G.C.)	max. 0,01 %
formaldehyde	max. 0,0005 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,01 %

liquid chromatography suitability

absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
235 nm	20 %	0,699 AU
240 nm	50 %	0,301 AU
245 nm	80 %	0,097 AU
248 nm	90 %	0,046 AU
255 nm	95 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
CL03471000	1 l
CL03472500	2,5 l
CL03474000	4 l
CL0347007E	7 l

CL0335 Dichloromethane, HPLC grade, stabilized with ethanol

Taric code: 2903 12 00 00

assay (G.C.)	min. 99,5 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,323 - 1,325
ethanol (G.C.)	max. 0,3 %
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

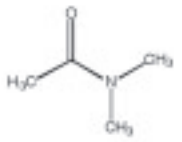
wavelength:	T[%]	A (AU)
235 nm	20 %	0,699 AU
238 nm	50 %	0,301 AU
247 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
CL03351000	1 l
CL03352500	2,5 l

N,N-Dimethylacetamide

T



Acetic acid dimethylamide
- C_4H_9NO • M = 87,12 g/mol
- CAS [127-19-5]
- EC number: 204-826-4

Physical data:
- Density: 0,94 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -20 °C
- Boiling point: 165 -166 °C
- Flash point: 70 °C
- Ignition temp.: 320 °C
- Vapour pressure: (20 °C) 1,76 hPa
- Refraction index: (n 20 °C/D) 1,4230
- Dipolar moment: (20 °C) 3,8 Debye
- Dielectric const.: (25 °C) 37,8
- Saturation conc.: (20 °C) 12 g/m³
- Expl. limit (upper): 11,5 Vol%
- Expl. limit (lower): 1,7 Vol%
- pH (200 g/l H_2O, 20 °C) ~ 4

Toxicological data:
- LD 50 (oral, rat): 4300 mg/kg
- MAK: 10 ml/m³, 36 mg/m³
- WGK: 1

Safety:
- EC Index no.: 616-011-00-4
- R: 61-E20/21
- S: 26-28.1-36/37-45
- VbF class: AIII
- Poison class CH (Swiss): 2

Transport/storage:
- LGK: 3 B
- Disposal: 1

DI0860 N,N-Dimethylacetamide, HPLC grade

Taric code: 2924 19 00 90

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,940 - 0,942
acidity	max. 0,0005 meq/g
alkalinity	max. 0,003 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,05 %

min. transmission/max. absorbance in a 1,0 cm cell at

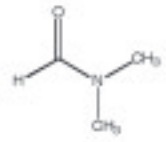
wavelength:	T[%]	A (AU)
275 nm	20 %	0,699 AU
285 nm	50 %	0,301 AU
310 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
DI08601000	1 l
DI08602500	2,5 l

N,N-Dimethylformamide

T



DMF, Formic acid dimethylamide
- C_3H_7NO • M = 73,10 g/mol
- CAS [68-12-2]
- EC number: 200-679-5

Physical data:
- Density: 0,94 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -61 °C
- Boiling point: 153 °C
- Flash point: 58 °C
- Ignition temp.: 410 °C
- Vapour pressure: (20 °C) 3,77 hPa
- Refraction index: (n 20 °C/D) 1,4305
- Viscosity: (20 °C) 0,8 mPas
- Dipolar moment: (20 °C) 3,8 Debye
- Dielectric const.: (20 °C) 36,7
- Saturation conc.: (20 °C) 12 g/m³
- Expl. limit (upper): 16 Vol%
- Expl. limit (lower): 2,2 Vol%
- pH (200 g/l H_2O, 20 °C) 7

Toxicological data:
- LD 50 (oral, rat): 2800 mg/kg
- MAK: 10 ml/m³, 30 mg/m³
- WGK: 1

Safety:
- EC Index no.: 616-001-00-X
- R: 61-E20/21-36
- S: 53-36/37-45
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 3 F1 III UN 2265
- IMDG: 3 III UN 2265
- IATA/ICAO: 3 III UN 2265
- PAX: 309
- CAO: 310
- LGK: 6.1 A
- Disposal: 1

DI1072 N,N-Dimethylformamide, Multisolvent® HPLC grade ACS ISO UV-VIS

Taric code: 2924 19 00 90

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,948 - 0,949
appearance	clear
colour (Hazen)	max. 10
acidity	max. 0,0005 meq/g
alkalinity	max. 0,003 meq/g
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,05 %

liquid chromatography suitability

absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

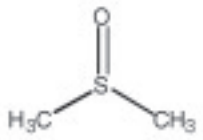
wavelength:	T[%]	A (AU)
268 nm	20 %	0,699 AU
275 nm	50 %	0,301 AU
290 nm	80 %	0,097 AU
300 nm	90 %	0,046 AU
330 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
DI10721000	1 l
DI10722500	2,5 l
DI10724000	4 l
DI1072007E	7 l
DI1072025S	25 l

Dimethyl sulfoxide

Xi



DMSO, Sulfinyl bis(methane), Methylsulfoxide, Methylsulfinylmethane
- C_2H_6OS • M = 78,13 g/mol
- CAS [67-68-5]
- EC number: 200-664-3

Physical data:
- Density: 1,10 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: 18,5 °C
- Boiling point: (33 hPa) 85 - 87 °C
- Flash point: 95 °C
- Ignition temp.: 300 - 302 °C
- Vapour pressure: (20 °C) 0,6 hPa
- Refraction index: (n 20 °C/D) 1,48
- Viscosity: (25 °C) 1,98 mPas
- Saturation conc.: (20 °C) 8,0 g/m³
- Expl. limit (upper): 63,0 Vol%
- Expl. limit (lower): 1,8 Vol%

Toxicological data:
- LD 50 (oral, rat): 14500 mg/kg
- WGK: 1

Safety:
- R: 36/38
- S: 26
- Poison class CH (Swiss): F

Transport/storage:
- LGK: 10-13
- Disposal: 1

SU0155 Dimethyl sulfoxide, HPLC grade

Taric code: 2930 90 70 90

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,099 - 1,101
acidity	max. 0,0005 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,1 %

min. transmission/max. absorbance in a 1,0 cm cell at

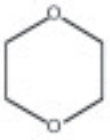
wavelength:	T(%)	A (AU)
268 nm	20 %	0,699 AU
280 nm	50 %	0,301 AU
320 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
SU01551000	1 l
SU01552500	2,5 l

1,4-Dioxane

F Xn



Glycolethylether, 1,4-Diethylene dioxide, 1,4-Dioxacyclohexane
- $C_4H_8O_2$ • M = 88,11 g/mol
- CAS [123-91-1]
- EC number: 204-661-8

Physical data:
- Density: 1,03 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: 12 °C
- Boiling point: 101,5 °C
- Flash point: 11 °C
- Ignition temp.: 300 °C
- Vapour pressure: (20 °C) 41 hPa
- Viscosity: (25 °C) 1,2 mPas
- Dipolar moment: (20 °C) 0,4 Debye
- Dielectric const.: (25 °C) 2,2
- Evap. heat: (101 °C) 413 KJ/kg
- Saturation conc.: (20 °C) 149 g/m³
- Expl. limit (upper): 25,2 Vol%
- Expl. limit (lower): 1,7 Vol%
- pH (500 g/l H_2O, 20 °C) 6 - 8

Toxicological data:
- LD 50 (oral, rat): 5200 mg/kg
- MAK: 20 ml/m³, 73 mg/m³
- WGK: 2

Safety:
- EC Index no.: 603-024-00-5
- R: 11-19-36/37-40-66
- S: 16-36/37
- VbF class: B
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1165
- IMDG: 3 II UN 1165
- IATA/ICAO: 3 II UN 1165
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

DI1292 1,4-Dioxane, HPLC grade, stabilized with 1 ppm of 2,6-Di-tert-butyl-4-methylphenol (BHT)

Taric code: 2932 99 85 90

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	1,032 - 1,034
acidity	max. 0,0005 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0005 %
water (K.F.)	max. 0,02 %

min. transmission/max. absorbance in a 1,0 cm cell at

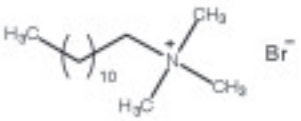
wavelength:	T(%)	A (AU)
215 nm	20 %	0,699 AU
230 nm	50 %	0,301 AU
275 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
DI12921000	1 l
DI12922500	2,5 l

n-Dodecyltrimethylammonium bromide

Xi



Lauryl trimethylammonium bromide
- $C_{15}H_{34}BrN$ • M = 308,35 g/mol
- CAS [1119-94-4]
- EC number: 214-290-3

Physical data:
- Melting point: 264 - 266 °C

Toxicological data:
- WGK: 3

Safety:
- R: 36/37/38

Transport/storage:
- LGK: 10-13

BR0180 n-Dodecyltrimethylammonium bromide, HPLC grade

Taric code: 2923 90 00 90

assay (argentometric)	min 97 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
240 nm	0,04 AU
250 nm	0,03 AU
260 nm	0,02 AU

Code	Capacity
BR01800025	25 g

Ethanol absolute

F

Ethyl alcohol, Methylcarbinol, Spirit, Spirit of wine
- C_2H_5OH • M = 46,07 g/mol
- CAS [64-17-5]
- EC number: 200-578-6

Physical data:
- Density: 0,79 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -114,5 °C
- Boiling point: 78,3 °C
- Flash point: 12 °C
- Ignition temp.: 425 °C
- Vapour pressure: (20 °C) 59 hPa
- Viscosity: (20 °C) 1,2 mPas
- Dipolar moment: (20 °C) 1,7 Debye
- Dielectric const.: (25 °C) 24,3
- Evap. heat: (78 °C) 855 KJ/kg
- Saturation conc.: (20 °C) 105 g/m³
- Expl. limit (upper): 15 Vol%
- Expl. limit (lower): 3,5 Vol%
- pH (10 g/l H_2O, 20 °C) 7,0

Toxicological data:
- LD 50 (oral, rat): 6200 mg/kg
- MAK: 500 ml/m³, 960 mg/m³
- WGK: 1

Safety:
- EC Index no.: 603-002-00-5
- R: 11
- S: 7-16
- VbF class: B
- Poison class CH (Swiss): F

Transport/storage:
- ADR: 3 F1 II UN 1170
- IMDG: 3 II UN 1170
- IATA/ICAO: 3 II UN 1170
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

ET0015 Ethanol absolute, Multisolvent® HPLC grade ACS ISO UV-VIS

Taric code: 2207 10 00 90

assay (G.C.) (wv)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,789 - 0,790
appearance	clear
solubility in water	passes test
colour (Hazen)	max. 10
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
chlorides (Cl)	max. 0,00003 %
nitrates (NO_3)	max. 0,00003 %
phosphates (PO_4)	max. 0,00003 %
sulfates (SO_4)	max. 0,00003 %
aluminium (Al)	max. 0,00001 %
antimony (Sb)	max. 0,000002 %
arsenic (As)	max. 0,000002 %
barium (Ba)	max. 0,000001 %
beryllium (Be)	max. 0,000002 %
bismuth (Bi)	max. 0,000002 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
gallium (Ga)	max. 0,000002 %
gold (Au)	max. 0,000002 %
indium (In)	max. 0,000002 %
iron (Fe)	max. 0,00001 %
lead (Pb)	max. 0,00001 %
lithium (Li)	max. 0,000002 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
molybdenum (Mo)	max. 0,000002 %
nickel (Ni)	max. 0,000002 %
platinum (Pt)	max. 0,000002 %
silver (Ag)	max. 0,000002 %
thallium (Tl)	max. 0,000002 %

tin (Sn)	max. 0,00001 %
titanium (Ti)	max. 0,000002 %
vanadium (V)	max. 0,000002 %
zinc (Zn)	max. 0,000001 %
zirconium (Zr)	max. 0,000002 %
formaldehyde	max. 0,0005 %
furfural	passes test
fusel oil	passes test
acetone (G.C.)	max. 0,001 %
benzene (G.C.)	max. 0,0002 %
iso-amyl alcohol (G.C.)	max. 0,05 %
methanol (G.C.)	max. 0,01 %
methylethylketone (G.C.)	max. 0,02 %
2-propanol (G.C.)	max. 0,003 %
acetaldehyde and acetal (G.C.)	max. 0,001 %
aldehydes (as CH_3CHO)	max. 0,001 %
carbonyl compounds (ac CO)	max. 0,003 %
higher alcohols (G.C.)	max. 0,01 %
$KMnO_4$ red. matter	max. 0,0002 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (wv) (K.F.)	max. 0,1 %

liquid chromatography suitability

absorbance	passes test	
min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
210 nm	35 %	0,456 AU
220 nm	55 %	0,260 AU
230 nm	72 %	0,143 AU
245 nm	90 %	0,046 AU
270 nm	98 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ET00151000	1 l
ET00152500	2,5 l
ET00154000	4 l
ET0015007E	7 l
ET0015025S	25 l

ET0010 Ethanol absolute, gradient HPLC grade

Taric code: 2207 10 00 90

assay (G.C.) (wv)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,789 - 0,790
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (wv) (K.F.)	max. 0,1 %

gradient grade (254 nm)

maximum background absorbance:	0,02 AU
maximum peak absorbance:	0,002 AU

min. transmission/max. absorbance in a 1,0 cm cell at		
wavelength:	T(%)	A (AU)
205 nm	20 %	0,699 AU
220 nm	50 %	0,301 AU
245 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ET00101000	1 l
ET00102500	2,5 l
ET0010007E	7 l
ET0010025S	25 l

Ethanol, approx. 96%

F

Ethyl alcohol, Methylcarbinol, Spirit, Spirit of wine
- C_2H_5OH • M = 46,07 g/mol
- CAS [64-17-5]
- EC number: 200-578-6

Physical data:
- Density: 0,81 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -117 °C
- Boiling point: 78 °C
- Flash point: 9 °C
- Ignition temp.: 425 °C
- Vapour pressure: (20 °C) ~ 59 hPa
- Viscosity: (20 °C) 1,2 mPas
- Dipolar moment: (20 °C) 1,7 Debye
- Dielectric const.: (25 °C) 24,3
- Saturation conc.: (20 °C) 105 g/m³
- Expl. limit (upper): 15 Vol%
- Expl. limit (lower): 3,5 Vol%
- pH (10 g/l H_2O, 20 °C) 7,0

Toxicological data:
- LD 50 (oral, rat): 6200 mg/kg (anhydrous substance)
- MAK: 500 ml/m³, 960 mg/m³
- WGK: 1

Safety:
- EC Index no.: 603-002-00-5
- R: 11
- S: 7-16
- VbF class: B
- Poison class CH (Swiss): F

Transport/storage:
- ADR: 3 F1 II UN 1170
- IMDG: 3 II UN 1170
- IATA/ICAO: 3 II UN 1170
- PAX: 305
- CAO: 307
- LGK: 3 A

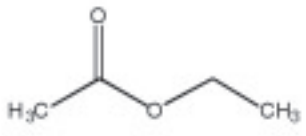
ET0013 Ethanol 96% v/v, Multisolvent® HPLC grade ACS UV-VIS

Taric code: 2207 10 00 90

assay (G.C.) (vV)	95,1- 96,9 %	titanium (Ti)	max. 0,000002 %
identity (IR-spectrum)	passes test	vanadium (V)	max. 0,000002 %
density (20°/4°)	0,804 - 0,807	zinc (Zn)	max. 0,000001 %
appearance	clear	zirconium (Zr)	max. 0,000002 %
colour (Hazen)	max. 10	formaldehyde	max. 0,0005 %
acidity	max. 0,0002 meq/g	furfural	passes test
alkalinity	max. 0,0002 meq/g	fusel oil	passes test
chlorides (Cl)	max. 0,00003 %	acetaldehyde and acetal (G.C.)	max. 0,001 %
nitrates (NO_3)	max. 0,00003 %	acetone (G.C.)	max. 0,001 %
phosphates (PO_4)	max. 0,00003 %	benzene (G.C.)	max. 0,0002 %
sulfates (SO_4)	max. 0,00003 %	iso-amyl alcohol (G.C.)	max. 0,05 %
aluminium (Al)	max. 0,00001 %	methanol (G.C.)	max. 0,01 %
antimony (Sb)	max. 0,000002 %	methylethylketone (G.C.)	max. 0,02 %
arsenic (As)	max. 0,000002 %	2-propanol (G.C.)	max. 0,003 %
barium (Ba)	max. 0,000001 %	aldehydes (as CH₃CHO)	max. 0,001 %
beryllium (Be)	max. 0,000002 %	carbonyl compounds (as CO)	max. 0,003 %
bismuth (Bi)	max. 0,000002 %	higher alcohols (G.C.)	max. 0,01 %
boron (B)	max. 0,000002 %	KMnO4 red. matter	max. 0,0002 %
cadmium (Cd)	max. 0,000001 %	substances darkened by H_2SO_4	passes test
calcium (Ca)	max. 0,00003 %	non-volatile matter	max. 0,0002 %
chromium (Cr)	max. 0,000002 %	water (vV) (K.F.)	3,1- 4,9 %
cobalt (Co)	max. 0,000002 %		
copper (Cu)	max. 0,000002 %	liquid chromatography suitability	
gallium (Ga)	max. 0,000002 %	absorbance	passes test
gold (Au)	max. 0,000002 %		
indium (In)	max. 0,000002 %	min. transmission/max. absorbance	
iron (Fe)	max. 0,000002 %	in a 1,0 cm cell at	
lead (Pb)	max. 0,00001 %	wavelength:	T(%) A (AU)
lithium (Li)	max. 0,000002 %	210 nm	35 % 0,456 AU
magnesium (Mg)	max. 0,00001 %	220 nm	55 % 0,260 AU
manganese (Mn)	max. 0,000002 %	230 nm	72 % 0,143 AU
molybdenum (Mo)	max. 0,000002 %	250 nm	90 % 0,046 AU
nickel (Ni)	max. 0,000002 %	270 nm	98 % 0,009 AU
platinum (Pt)	max. 0,000002 %		
silver (Ag)	max. 0,000002 %	Microfiltered through membranes	
thallium (Tl)	max. 0,000002 %	of pore diameter 0,22 µm	
tin (Sn)	max. 0,00001 %		

Code	Capacity
ET00131000	1 l
ET00132500	2,5 l
ET00134000	4 l
ET0013007E	7 l
ET0013025S	25 l

Ethyl acetate



Acetic acid ethyl ester, Acetic ether
- $C_4H_8O_2$ • M = 88,10 g/mol
- CAS [141-78-6]
- EC number: 205-500-4

Physical data:
- Density: 0,90 g/cm³
- Solub. in water (20 °C): 85,3 g/l
- Melting point: -83 °C
- Boiling point: 77 °C
- Flash point: -4 °C
- Ignition temp.: 460 °C
- Vapour pressure: (20 °C) 97hPa
- Refraction index: [n 20 °C/D) 1,3723
- Viscosity: (20 °C) 0,44 mPas
- Dipolar moment: (20 °C) 1,78 Debye
- Dielectric const.: (25 °C) 6,0
- Evap. heat: (77 °C) 427 KJ/kg
- Saturation conc.: (20 °C) 336 g/m³
- Expl. limit (upper): 11,5 Vol%
- Expl. limit (lower): 2,1 Vol%

Toxicological data:
- LD 50 (oral, rat): 5620 mg/kg
- MAK: 400 ml/m³, 1500 mg/m³
- WGK: 1

Safety:
- EC Index no.: 607-022-00-5
- R: 11-36-66-67
- S: 16-26-33
- VbF class: AI
- Poison class CH (Swiss): 5

Transport/storage:
- ADR: 3 F1 II UN 1173
- IMDG: 3 II UN 1173
- IATA/ICAO: 3 II UN 1173
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

AC0155 Ethyl acetate, Multisolvent® HPLC grade ACS ISO UV-VIS

Taric code: 2915 31 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,899 - 0,901
appearance	clear
colour (Hazen)	max. 10
acidity	max. 0,0008 meq/g
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %

ethanol (G.C.)	max. 0,1 %
methanol (G.C.)	max. 0,1 %
methyl acetate (G.C.)	max. 0,1 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,03 %
liquid chromatography suitability	
absorbance	passes test
min. transmission/max. absorbance in a 1,0 cm cell at	
wavelength:	T(%) A (AU)
255 nm	20 % 0,699 AU
260 nm	50 % 0,301 AU
263 nm	80 % 0,097 AU
265 nm	90 % 0,046 AU
280 nm	98 % 0,009 AU
Microfiltered through membranes of pore diameter 0,22 µm	

Code	Capacity
AC01551000	1 l
AC01552500	2,5 l
AC01554000	4 l
AC0155007E	7 l
AC0155025S	25 l

NEW AC0158 Ethyl acetate, LC-MS

Taric code: 2915 31 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,899 - 0,902
alkalinity	max. 0,0002 meq/g
calcium (Ca)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
potassium (K)	max. 0,00001 %
sodium (Na)	max. 0,00001 %
non-volatile matter	max. 0,0005 %
water (K.F.)	max. 0,03 %
suitability for use in LC-MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at	
wavelength:	T(%) A (AU)
255 nm	20 % 0,699 AU
258 nm	50 % 0,301 AU
265 nm	90 % 0,046 AU
microfiltered through membranes of pore diameter 0,22 µm	

Code	Capacity
AC01581000	1 l
AC01582500	2,5 l

Formic acid, solution 10% in water

Safety:
- R: 34
- S: 23.2-26-45

Transport/storage:
- ADR: 8 C3 II UN 3265
- IMDG: 8 II UN 3265
- IATA/ICAO: 8 II UN 3265
- PAX: 808
- CAO: 812

NEW AC1075 Formic acid, solution 10% in water, for cleaning purposes, LC-MS

Taric code: 2915 11 00 00

formic acid content (w/w)	9,5 - 10,5 %
aluminium (Al)	max. 0,000005 %
calcium (Ca)	max. 0,000005 %
iron (Fe)	max. 0,000005 %
magnesium (Mg)	max. 0,000005 %
potassium (K)	max. 0,000005 %
sodium (Na)	max. 0,000005 %
suitability for use in LC-MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at	
wavelength:	T(%) A (AU)
260 nm	80 % 0,097 AU
280 nm	90 % 0,046 AU

Code	Capacity
AC10751000	1 l

Heptafluorobutyric acid, 99,5 %

Perfluorobutyric acid, HFBA, Edman reagent No. 3

- $C_4HF_7O_2$ • M = 214,04 g/mol
- CAS [375-22-4]
- EC number: 206-786-3

Physical data:
- Density: 1,645 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -17,5 °C
- Boiling point: (755mm Hg) 120 °C

Toxicological data:
- MAK: 5 ml/m³, 7 mg/m³

Safety:
- R: 34
- S: 26-36/37/39-45

Transport/storage:
- ADR: 8 C3 II UN 3265
- IMDG: 8 II UN 3265
- IATA/ICAO: 8 II UN 3265
- PAX: 808
- CAO: 812

NEW AC1235 Heptafluorobutyric acid, 99,5 %

Taric code: 2915 60 19 00

assay (G.C.)	min. 99,5 %	water (K.F.)	max. 0,1 %

Code	Capacity
AC12350100	100 ml

n-Heptane

n-Dipropylmethane, n-Heptylhydride
- C_7H_{16} • M = 100,21 g/mol
- CAS [142-82-5]
- EC number: 205-563-8

Physical data:
- Density: 0,68 g/cm³
- Solub. in water (20 °C): almost non-miscible
- Melting point: -90,6 °C
- Boiling point: 98,4 °C
- Flash point: -4 °C
- Ignition temp.: 215 °C
- Vapour pressure: (20 °C) 48 hPa
- Refraction index: (n 20 °C/D) 1,3876
- Viscosity: (20 °C) 0,4 mPas
- Dielectric const.: (20 °C) 1,9
- Saturation conc.: (20 °C) 196 g/m³
- Expl. limit (upper): 7 Vol%
- Expl. limit (lower): 1 Vol%

Toxicological data:
- LD 50 (oral, rat): > 15000 mg/kg
- MAK: 500 ml/m³, 2100 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-008-00-2
- R: 11-38-50/53-65-67
- S: 9-16-29-33-46-60-61-62
- VbF class: AI
- Poison class CH (Swiss): 5

Transport/storage:
- ADR: 3 F1 II UN 1206
- IMDG: 3 II UN 1206
- IATA/ICAO: 3 II UN 1206
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

HE0131 n-Heptane, 99%, HPLC grade

Taric code: 2901 10 00 00

assay (G.C.)	min. 99,3 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,683 - 0,685
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T[%]	A (AU)
200 nm	20 %	0,699 AU
210 nm	50 %	0,301 AU
227 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
HE01311000	1 l
HE01312500	2,5 l
HE0131007E	7 l
HE0131025S	25 l

1-Heptane sulfonic acid, sodium salt monohydrate

Sodium 1-heptylsulfonate monohydrate
- $C_7H_{15}NaO_3S \cdot H_2O$
- M = 220,26 g/mol
- CAS [207300-90-1]

Physical data:
- Solub. in water (20 °C): freely soluble

Toxicological data:
- WGK: 2

Transport/storage:
- LGK: 10-13
- Disposal: 28

NEW AC1242 1-Heptane sulfonic acid, sodium salt monohydrate, HPLC grade

Taric code: 2904 10 00 90

assay (acidimetric)	min. 98 %
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
210 nm	0,1 AU
220 nm	0,06 AU
230 nm	0,04 AU
260 nm	0,02 AU

Code	Capacity
AC12420025	25 g
AC12420100	100 g

1-Heptane sulfonic acid, sodium salt, solution 0,1 mol/l

- $C_7H_{15}NaO_3S$
- M = 202,25 g/mol
- CAS [22767-50-6]
- EC number: 245-210-5

Toxicological data:
- WGK: 2

Transport/storage:
- LGK: 10-13
- Disposal: 28

AC1240 1-Heptane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade

Tanic code: 2904 10 00 90

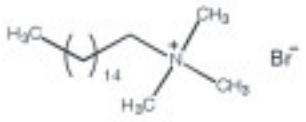
factor limits	0,995 - 1,005
pH (20 °C)	3,5 ± 0,1
absorbance of an aqueous solution 0,005 M in a 1 cm cell at 254 nm	< 0,02 AU

Contains acetic acid as preservative

To obtain a solution 0,005 M dilute 1:20 with the appropriate mixture of water-solvent

Code	Capacity
AC12400250	250 ml

Hexadecyltrimethylammonium bromide



Cetrimonium bromide, Trimethylhexadecylammonium bromide, N-Cetyl-N,N,N-trimethylammonium bromide, CTAB

- $C_{19}H_{42}BrN$
- M = 364,46 g/mol
- CAS [57-09-0]
- EC number: 200-311-3

Physical data:
- Bulk density: ~ 390 kg/m³
- Solub. in water (20 °C): 3 g/l
- Melting point: 237 - 243 °C
- pH (50 g/l H_2O, 20 °C) 5 - 7

Toxicological data:
- LD 50 (oral, rat): 410 mg/kg
- WGK: 3

Safety:
- R: 22-36/38-50/53
- S: 26-39-46-61
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 9 M7 III UN 3077
- IMDG: 9 III UN 3077
- IATA/ICAO: 9 III UN 3077
- PAX: 911
- CAO: 911
- LGK: 10-13
- Disposal: 3

BR0170 Hexadecyltrimethylammonium bromide, HPLC grade

Tanic code: 2923 90 00 90

assay (argentometric)	min. 97 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of a solution in methanol (10%) in a 1,0 cm cell at

wavelength:	absorbance:
240 nm	0,04 AU
250 nm	0,03 AU
260 nm	0,02 AU

Code	Capacity
BR01700025	25 g

n-Hexane

n-Caproylhydride, n-Hexylhydride
- C_6H_{14} • M = 86,18 g/mol
- CAS [110-54-3]
- EC number: 203-777-6

Physical data:
- Density: 0,66 g/cm³
- Solub. in water (20 °C): 0,0095 g/l
- Melting point: -94,3 °C
- Boiling point: 69 °C
- Flash point: -22 °C
- Ignition temp.: 240 °C
- Vapour pressure: (20 °C) 160 hPa
- Viscosity: (20 °C) 0,31 mPas
- Dielectric const.: (20 °C) 1,8
- Saturation conc.: (20 °C) 563 g/m³
- Expl. limit (upper): 8,1 Vol%
- Expl. limit (lower): 1,0 Vol%

Toxicological data:
- LD 50 (oral, rat): 28710 mg/kg
- MAK: 50 ml/m³, 180 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-037-00-0
- R: 11-38-48/20-62-65-67-51/53
- S: 9-16-29-33-36/37-61-62
- VbF class: AI
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1208
- IMDG: 3 II UN 1208
- IATA/ICAO: 3 II UN 1208
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

HE0234 n-Hexane, 96%, Multisolvent® HPLC grade ACS UV-VIS

Tanic code: 2901 10 00 00

assay (G.C.)	min. 96 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,659 - 0,662
appearance	clear
colour (Hazen)	max. 10
acidity	max. 0,0003 meq/g
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,000001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %

aromatic compounds (as benzene)	max. 0,01 %
sulphur compounds (as S)	max. 0,005 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,005 %

liquid chromatography suitability

absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T[%]	A (AU)
200 nm	10 %	1,000 AU
210 nm	40 %	0,398 AU
217 nm	70 %	0,155 AU
225 nm	80 %	0,097 AU
245 nm	95 %	0,009 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
HE02341000	1 l
HE02342500	2,5 l
HE02344000	4 l
HE0234007E	7 l
HE0234025S	25 l

HE0242 n-Hexane, 99%, HPLC grade

Taric code: 2901 10 00 00

assay (G.C.)	min 99 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,660 - 0,662
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
200 nm	20 %	0,699 AU
210 nm	50 %	0,301 AU
230 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
HE02421000	1 l
HE02422500	2,5 l

Hexane, fraction from petroleum

F Xn N

- C_6H_{14} • M = 86,18 g/mol
- CAS [110-54-3]
- EC number: 203-777-6

Physical data:
- Density: 0,67 g/cm³
- Solub. in water (20 °C): insoluble
- Boiling point: 65 - 70 °C
- Flash point: -22 °C
- Vapour pressure: (20 °C) 160 hPa
- Refraction index: (n 20 °C/D) 1,380
- Expl. limit (upper): 8,1 Vol%
- Expl. limit (lower): 1,0 Vol%

Toxicological data:
- MAK: 200 ml/m³, 720 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-037-00-0
- R: 11-38-48/20-62-65-67-51/53
- S: 9-16-29-33-36/37-61-62
- VbF class: AI
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1208
- IMDG: 3 II UN 1208
- IATA/ICAO: 3 II UN 1208
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

HE0221 Hexane, fraction from petroleum, Multisolvent® HPLC grade ACS

Taric code: 2901 10 00 00

boiling range	65 - 70 °C
appearance	clear
colour (Hazen)	max. 10
acidity	max. 0,0002 meq/g
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %
aromatic compounds (as benzene)	max. 0,01 %
sulphur compounds (as S)	max. 0,005 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,01 %
liquid chromatography suitability	
absorbance	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
200 nm	10 %	1,000 AU
210 nm	30 %	0,523 AU
230 nm	90 %	0,046 AU
254 nm	99 %	0,004 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
HE02211000	1 l
HE02212500	2,5 l
HE02214000	4 l
HE0221007E	7 l
HE0221025S	25 l

1-Hexane sulfonic acid, sodium salt monohydrate

Sodium 1-hexylsulfonate monohydrate

- $C_6H_{13}NaO_3S \cdot H_2O$ • M = 206,24 g/mol
- CAS [207300-91-2]

Physical data:
- Solub. in water (20 °C): freely soluble

Transport/storage:
- LGK: 10-13
- Disposal: 28

NEW AC1247 1-Hexane sulfonic acid, sodium salt monohydrate, HPLC grade

Taric code: 2904 10 00 90

assay (acidimetric)	min. 98 %
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
210 nm	0,1 AU
220 nm	0,06 AU
230 nm	0,04 AU
250 nm	0,02 AU

Code	Capacity
AC12470025	25 g
AC12470100	100 g

1-Hexane sulfonic acid, sodium salt, solution 0,1 mol/l

- $C_6H_{13}NaO_3S$
- M = 188,22 g/mol
- CAS [2832-45-3]
- EC number: 220-601-3

AC1245 1-Hexane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade

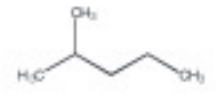
Tanic code: 2904 10 00 90

factor limits	0,995 - 1,005	Contains acetic acid as preservative
pH (20 °C)	3,5 ± 0,1	
absorbance of an aqueous solution 0,005 M in a 1 cm cell at 254 nm	< 0,02 AU	To obtain a solution 0,005 M dilute 1:20 with the appropiate mixture of water-solvent

Code	Capacity
AC12450250	250 ml

Isohexane

F Xn N



(main isomer)

- C_6H_{14} • M = 86,18 g/mol
- CAS [73513-42-5]
- EC number: 295-570-2

Physical data:
- Density: 0,65 g/cm³
- Solub. in water (20 °C): 0,02 g/l
- Melting point: -153 °C
- Boiling point: 53 - 63 °C
- Flash point: -26 °C
- Ignition temp.: 260 °C
- Vapour pressure: (20 °C) 240 hPa
- Expl. limit (upper): 8,0 Vol%
- Expl. limit (lower): 0,8 Vol%

Toxicological data:
- LD 50 (oral, rat): > 5000 mg/kg
- MAK: 50 ml/m³, 180 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-007-00-7
- R: 11-38-51/53-65-67
- S: 9-16-29-33-61-62
- VbF class: AI

Transport/storage:
- ADR: 3 F1 II UN 1208
- IMDG: 3 II UN 1208
- IATA/ICAO: 3 II UN 1208
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

IS0122 Isohexane, Multisolvent® HPLC grade UV-VIS

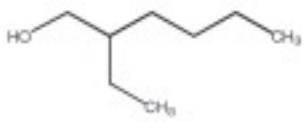
Tanic code: 2901 10 00 00

assay (G.C.)	min. 96,5 %	n-hexane (G.C.)	max. 3,5 %		
identity (IR-spectrum)	passes test	aromatic compounds (as benzene)	max. 0,01 %		
appearance	clear	sulphur compounds (as S)	max. 0,005 %		
colour (Hazen)	max. 10	thiophene	max. 0,0001 %		
acidity	max. 0,0003 meq/g	substances darkened by H_2SO_4	passes test		
aluminium (Al)	max. 0,00001 %	non-volatile matter	max. 0,0002 %		
barium (Ba)	max. 0,000001 %	water (K.F.)	max. 0,005 %		
boron (B)	max. 0,000002 %				
cadmium (Cd)	max. 0,000001 %	min. transmission/max. absorbance			
calcium (Ca)	max. 0,00003 %	in a 1,0 cm cell at			
chromium (Cr)	max. 0,000002 %	wavelength:	T[%]	A [AU]	
cobalt (Co)	max. 0,000002 %	200 nm	10 %	1,000 AU	
copper (Cu)	max. 0,000002 %	210 nm	50 %	0,301 AU	
iron (Fe)	max. 0,000002 %	217 nm	70 %	0,155 AU	
lead (Pb)	max. 0,00001 %	225 nm	80 %	0,097 AU	
magnesium (Mg)	max. 0,00001 %	245 nm	95 %	0,009 AU	
manganese (Mn)	max. 0,000001 %				
nickel (Ni)	max. 0,000002 %	Microfiltered through membranes			
tin (Sn)	max. 0,00001 %	of pore diameter 0,22 µm			
zinc (Zn)	max. 0,000001 %				

Code	Capacity
IS01221000	1 l
IS01222500	2,5 l

Isooctanol

Xi



2-Ethyl-1-hexanol, isooctyl alcohol
- $C_8H_{18}O$ • M = 130,23 g/mol
- CAS [104-76-7]
- EC number: 203-234-3

Physical data:
- Density: 0,83 g/cm³
- Solub. in water (20 °C): 1,1 g/l
- Melting point: -76 °C
- Boiling point: 185 °C
- Flash point: 75 °C
- Ignition temp.: 270 - 330 °C
- Vapour pressure: (20 °C) 0,13 hPa
- Refraction index: (n 20 °C/D) 1,4317
- Viscosity: (20 °C) 10 mPas
- Dielectric const.: (20 °C) 7,7
- Saturation conc.: (20 °C) 0,36 g/m³
- Expl. limit (upper): 12,7 Vol%
- Expl. limit (lower): 1,1 Vol%
- pH (1 g/l H_2O, 20 °C) 7

Toxicological data:
- LD 50 (oral, rat): 3730 mg/kg
- MAK: 50 ml/m³, 270 mg/m³
- WGK: 2

Safety:
- R: 36/38
- VbF class: AIII
- Poison class CH (Swiss): 4

Transport/storage:
- IATA/ICAO: 9 / UN 3334
- PAX: 906
- CAO: 906
- LGK: 3 B
- Disposal: 1

IS0162 Isooctanol, HPLC grade

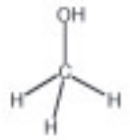
Tanic code: 2905 16 10 00

assay (G.C.)	min. 99 %	min. transmission/max. absorbance			
identity (IR-spectrum)	passes test	in a 1,0 cm cell at			
density (20°/4°)	0,832 - 0,833	wavelength:	T[%]	A [AU]	
acidity	max. 0,002 meq/g	240 nm	40 %	0,398 AU	
alkalinity	max. 0,001 meq/g	260 nm	80 %	0,097 AU	
non-volatile matter	max. 0,0003 %				
water (K.F.)	max. 0,15 %	Microfiltered through membranes			
		of pore diameter 0,22 µm			

Code	Capacity
IS01622500	2,5 l

Methanol

F T



Methyl alcohol, Carbinol, Methynol, Wood alcohol

- CH_3OH • M = 32,04 g/mol
- CAS [67-56-1]
- EC number: 200-659-6

Physical data:
- Density: 0,79 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -98 °C
- Boiling point: 64,5 °C
- Flash point: 11 °C
- Ignition temp.: 455 °C
- Vapour pressure: (20 °C) 128 hPa
- Refraction index: (n 20 °C/D) 1,3288
- Viscosity: (20 °C) 0,52 mPas
- Dipolar moment: (20 °C) 1,7 Debye
- Dielectric const.: (25 °C) 32,6
- Evap. heat: (65 °C) 1100 KJ/kg
- Saturation conc.: (20 °C) 166 g/m³
- Expl. limit (upper): 44 Vol%
- Expl. limit (lower): < 5,5 Vol%

Toxicological data:
- LD 50 (oral, rat): 5628 mg/kg
- MAK: 200 ml/m³ ; 270 mg/m³
- WGK: 1

Safety:
- EC Index no.: 603-001-00-X
- R: 11-23/24/25-39/23/24/25
- S: 7-16-36/37-45
- VbF class: B
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 3 FT1 II UN 1230
- IMDG: 3 II UN 1230
- IATA/ICAO: 3 II UN 1230
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

ME0315 Methanol, Multisolvent® HPLC grade ACS ISO UV-VIS K.F.

Tanic code: 2905 11 00 00

assay (G.C.)	min. 99,9 %	thallium (Tl)	max. 0,000002 %
identity (IR-spectrum)	passes test	tin (Sn)	max. 0,00001 %
density (20°/4°)	0,791 - 0,792	titanium (Ti)	max. 0,000002 %
appearance	clear	vanadium (V)	max. 0,000002 %
colour (Hazen)	max. 10	zinc (Zn)	max. 0,000001 %
solubility in water	passes test	zirconium (Zr)	max. 0,000002 %
acidity	max. 0,0002 meq/g	acetone (G.C.)	max. 0,001 %
alkalinity	max. 0,0002 meq/g	ethanol (G.C.)	max. 0,05 %
chlorides (Cl)	max. 0,00005 %	aldehydes, ketones (as acetone)	max. 0,001 %
sulfates (SO_4)	max. 0,0001 %	acetaldehyde	max. 0,001 %
aluminium (Al)	max. 0,00001 %	formaldehyde	max. 0,0001 %
arsenic (As)	max. 0,000002 %	carbonyl compounds (as CO)	max. 0,001 %
barium (Ba)	max. 0,000001 %	substances darkened by H_2SO_4	passes test
beryllium (Be)	max. 0,000002 %	$KMnO_4$ red. matter (as O)	max. 0,00025 %
bismuth (Bi)	max. 0,000002 %	non-volatile matter	max. 0,0003 %
boron (B)	max. 0,000002 %	water (K.F.)	max. 0,03 %
cadmium (Cd)	max. 0,000001 %		
calcium (Ca)	max. 0,00003 %	liquid chromatography suitability	
chromium (Cr)	max. 0,000002 %	absorbance	passes test
cobalt (Co)	max. 0,000002 %	gradient elution	passes test
copper (Cu)	max. 0,000002 %		
gallium (Ga)	max. 0,000002 %	min. transmission/max. absorbance	
gold (Au)	max. 0,000002 %	in a 1,0 cm cell at	
indium (In)	max. 0,000002 %	wavelength:	T(%) A (AU)
iron (Fe)	max. 0,000002 %	207 nm	10 % 1,000 AU
lead (Pb)	max. 0,00001 %	220 nm	50 % 0,301 AU
lithium (Li)	max. 0,000005 %	232 nm	80 % 0,097 AU
magnesium (Mg)	max. 0,00001 %	242 nm	90 % 0,046 AU
manganese (Mn)	max. 0,000001 %	260 nm	95 % 0,009 AU
molybdenum (Mo)	max. 0,000002 %		
nickel (Ni)	max. 0,000002 %	Microfiltered through membranes	
platinum (Pt)	max. 0,000005 %	of pore diameter 0,22 µm	
silver (Ag)	max. 0,000002 %		

Code	Capacity
ME03151000	1 l
ME03152500	2,5 l
ME03154000	4 l
ME0315007E	7 l
ME0315025S	25 l

NEW ME0326 Methanol, LC-MS

Tanic code: 2905 11 00 00

assay (G.C.)	min. 99,9 %	sodium (Na)	max. 0,00001 %
identity (IR-spectrum)	passes test	tin (Sn)	max. 0,00001 %
density (20°/4°)	0,791 - 0,792	zinc (Zn)	max. 0,00001 %
acidity	max. 0,0002 meq/g	non-volatile matter	max. 0,0005 %
alkalinity	max. 0,0002 meq/g	water (K.F.)	max. 0,02 %
aluminium (Al)	max. 0,00005 %	suitability for use in LC-MS	passes test
barium (Ba)	max. 0,00001 %		
cadmium (Cd)	max. 0,000005 %	min. transmission/max. absorbance	
calcium (Ca)	max. 0,00001 %	in a 1,0 cm cell at	
chromium (Cr)	max. 0,000002 %	wavelength:	T(%) A (AU)
cobalt (Co)	max. 0,000002 %	205 nm	20 % 0,699 AU
copper (Cu)	max. 0,000001 %	215 nm	50 % 0,301 AU
iron (Fe)	max. 0,00001 %	240 nm	90 % 0,046 AU
lead (Pb)	max. 0,000002 %		
magnesium (Mg)	max. 0,00001 %	gradient grade (254 nm)	
manganese (Mn)	max. 0,000001 %	maximum peak absorbance	max. 0,0002 AU
nickel (Ni)	max. 0,000002 %		
potassium (K)	max. 0,00001 %	microfiltered through membranes	
silver (Ag)	max. 0,00001 %	of pore diameter 0,22 µm	

Code	Capacity
ME03261000	1 l
ME03262500	2,5 l

ME0317 **Methanol**, fluorescence HPLC grade

Taric code: 2905 11 00 00

assay (G.C.)	min 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,791 - 0,792
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0001 %
water (K.F.)	max. 0,02 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
205 nm	20 %	0,699 AU
215 nm	50 %	0,301 AU
240 nm	90 %	0,046 AU

gradient grade (235 nm)

maximum background absorbance:	0,015 AU
maximum peak absorbance:	0,0015 AU

fluorescence analysis:
maxium absorbance: 1 ppb as quinine (in 0,1 N sulfuric acid), for the spectra recorded at the following conditions:
EX wavelength between 200 and 450
EM wavelength between 250 and 550

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME03171000	1 l
ME03172500	2,5 l

ME0306 **Methanol**, gradient HPLC grade

Taric code: 2905 11 00 00

assay (G.C.)	min 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,791 - 0,792
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0001 %
water (K.F.)	max. 0,02 %

gradient grade (235 nm)

maximum background absorbance	0,015 AU
maximum peak absorbance	0,0015 AU

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
205 nm	20 %	0,699 AU
215 nm	50 %	0,301 AU
240 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME03061000	1 l
ME03062500	2,5 l
ME03064000	4 l
ME0306007E	7 l
ME0306025S	25 l

ME0310 **Methanol**, isocratic HPLC grade (254 nm)

Taric code: 2905 11 00 00

assay (G.C.)	min. 99,7 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,791 - 0,792
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0005 %
water (K.F.)	max. 0,05 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
212 nm	20 %	0,699 AU
220 nm	50 %	0,301 AU
243 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME03101000	1 l
ME03102500	2,5 l
ME03104000	4 l
ME0310007E	7 l
ME0310025S	25 l

Methanol with 0,1% acetic acid

 F  T

Safety:
- R: 11-23/24/25-39/23/24/25
- S: 7-16-36/37-45
- VbF class: B

Transport/storage:
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- PAX: 305
- CAO: 307

NEW ME0329 **Methanol with 0,1% acetic acid** , LC-MS

Taric code: 3822 00 00 00

acetic acid content (v/v)	0,093 - 0,107 %
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test

gradient grade (254 nm)

maximum peak absorbance	max. 0,01 AU

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	5 %	1,301 AU
230 nm	50 %	0,301 AU
254 nm	95 %	0,022 AU

microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME03291000	1 l
ME03292500	2,5 l

Methanol with 0,1% ammonium acetate

F T

Safety:
- R: 11-23/24/25-39/23/24/25
- S: 7-16-36/37-45
- VbF class: B

Transport/storage:
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- PAX: 305
- CAO: 307

NEW ME0330 Methanol with 0,1% ammonium acetate, LC-MS

Tanic code: 3822 00 00 00

ammonium acetate content (w/v)	0,093 - 0,107 %
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test
gradient grade (254 nm)	
maximum peak absorbance	max. 0,01 AU

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	5 %	1,301 AU
230 nm	60 %	0,222 AU
254 nm	90 %	0,046 AU

microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME03301000	1 l
ME03302500	2,5 l

Methanol with 0,1% trifluoroacetic acid

F T

Safety:
- R: 11-23/24/25-39/23/24/25
- S: 7-16-36/37-45
- VbF class: B

Transport/storage:
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- PAX: 305
- CAO: 307

NEW ME0327 Methanol with 0,1% trifluoroacetic acid, LC-MS

Tanic code: 3822 00 00 00

trifluoroacetic acid content (w/v)	0,093 - 0,107 %
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test
gradient grade (254 nm)	
maximum peak absorbance	max. 0,01 AU

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	5 %	1,301 AU
230 nm	35 %	0,456 AU
254 nm	90 %	0,046 AU

microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ME03271000	1 l
ME03272500	2,5 l

Mixture 2-propanol/water, 50:50 (v/v)

Safety:
- R: 10-36-67
- S: 26

Transport/storage:
- ADR: 3 F1 III UN 1993
- IMDG: 3 III UN 1993
- IATA/ICAO: 3 III UN 1993
- PAX: 309
- CAO: 310

NEW ME0797 Mixture 2-propanol/water, 50:50 (v/v), for cleaning purposes, LC-MS

Tanic code: 3822 00 00 00

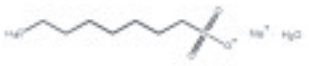
aluminium (Al)	max. 0,00005 %
barium (Ba)	max. 0,00001 %
cadmium (Cd)	max. 0,000005 %
calcium (Ca)	max. 0,00001 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,00001 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000002 %
nickel (Ni)	max. 0,000002 %
potassium (K)	max. 0,00001 %
silver (Ag)	max. 0,00001 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,00001 %
organic impurities (G.C.)	max. 0,1 %
non-volatile matter	max. 0,001 %
water (K.F.)	49 - 51 %
identity for 2-propanol (G.C.)	passes test
suitability for use in LC-MS	passes test

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	80 %	0,097 AU
230 nm	90 %	0,046 AU
254 nm	98 %	0,009 AU

Code	Capacity
ME07971000	1 l

1-Octane sulfonic acid, sodium salt monohydrate



Sodium 1-octylsulfonate monohydrate

- $C_8H_{17}NaO_3S \cdot H_2O$
- M = 234,29 g/mol
- CAS [207596-29-0]

Physical data:
- Solub. in water (20 °C): soluble

Toxicological data:
- WGK: 3*

Transport/storage:
- LGK: 10-13
- Disposal: 3

NEW **AC1702 1-Octane sulfonic acid, sodium salt monohydrate**, HPLC grade

Taric code: 2904 10 00 90

assay (acidimetric)	min. 98 %
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
210 nm	0,1 AU
220 nm	0,06 AU
230 nm	0,04 AU
260 nm	0,02 AU

Code	Capacity
AC17020025	25 g

1-Octane sulfonic acid, sodium salt, solution 0,1 mol/l

- $C_8H_{17}NaO_3S$
- M = 216,28 g/mol
- CAS [5324-84-5]
- EC number: 226-195-4

Toxicological data:
- WGK: 2

Transport/storage:
- LGK: 10-13
- Disposal: 3

AC1700 1-Octane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade

Taric code: 2904 10 00 90

factor limits	0,995-1,005
pH (20 °C)	3,5 ± 0,1
absorbance of an aqueous solution 0,005 M in a 1 cm cell at 254 nm	< 0,02 AU

Contains acetic acid as preservative

To obtain a solution 0,005 M dilute 1:20 with the appropiate mixture of water-solvent

Code	Capacity
AC17000250	250 ml
AC17001000	1 l

n-Pentane

1,3-Dimethylpropane, Diethyl methane
- C_5H_{12} • M = 72,15 g/mol
- CAS [109-66-0]
- EC number: 203-692-4

Physical data:
- Density: 0,63 g/cm³
- Solub. in water (25 °C): 0,04 g/l
- Melting point: -129,7 °C
- Boiling point: 36,1 °C
- Flash point: -49,4 °C
- Ignition temp.: 285 °C
- Vapour pressure: (20 °C) 573 hPa
- Dielectric const.: (20 °C) 1,8
- Evap. heat: (36 °C) 383 KJ/kg
- Saturation conc.: (20 °C) 1689 g/m³
- Expl. limit (upper): 8 Vol%
- Expl. limit (lower): 1,4 Vol%

Toxicological data:
- MAK: 1000 ml/m³ , 3000 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-006-00-1 [1]
- R: 12-51/53-65-66-67
- S: 9-16-29-33-61-62
- VbF class: AI
- Poison class CH (Swiss): 5

Safety:
- EC Index no.: 601-006-00-1 [1]
- R: 12-51/53-65-66-67
- S: 9-16-29-33-61-62
- VbF class: AI
- Poison class CH (Swiss): 5

Transport/storage:
- ADR: 3 F1 II UN 1265
- IMDG: 3 II UN 1265
- IATA/ICAO: 3 II UN 1265
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

PE0097 n-Pentane, 99%, HPLC grade

Taric code: 2901 10 00 00

assay (G.C.)	min. 99 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,625 - 0,627
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T[%]	A (AU)
200 nm	20 %	0,699 AU
210 nm	50 %	0,301 AU
230 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
PE00971000	1 l
PE00972500	2,5 l
PE0097007E	7 l

1-Pentane sulfonic acid, sodium salt monohydrate

Sodium 1-pentylsulfonate monohydrate

- $C_5H_{11}NaO_3S \cdot H_2O$
- M = 192,21 g/mol
- CAS [207605-40-1]

Physical data:
- Solub. in water (20 °C): freely soluble

Toxicological data:
- WGK: 3

Transport/storage:
- LGK: 10-13
- Disposal: 28

NEW **AC1745 1-Pentane sulfonic acid, sodium salt monohydrate**, HPLC grade

Taric code: 2904 10 00 90

assay (acidimetric)	min. 98 %
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
210 nm	0,1 AU
220 nm	0,06 AU
230 nm	0,04 AU
260 nm	0,02 AU

Code	Capacity
AC17450025	25 g

1-Pentane sulfonic acid, sodium salt, solution 0,1 mol/l

- $C_5H_{11}NaO_3S$
- M = 174,20 g/mol
- CAS [22767-49-3]
- EC number: 245-208-4

Transport/storage:
- Disposal: 28

AC1740 1-Pentane sulfonic acid, sodium salt, solution 0,1 mol/l, HPLC grade

Taric code: 2904 10 00 90

factor limits	0,995-1,005
pH (20 °C)	3,5 ± 0,1
absorbance of an aqueous solution 0,005 M in a 1 cm cell at 254 nm	< 0,02 AU

Contains acetic acid as preservative

To obtain a solution 0,005 M dilute 1:20 with the appropiate mixture of water-solvent

Code	Capacity
AC17400250	250 ml

Petroleum ether, boiling range 40 - 60 °C

F Xn

Petroleum benzine, Petroleum spirit
- CAS [64742-49-0]
- EC number: 265-151-9

Physical data:
- Density: (15 °C) 0,65 g/cm³
- Solub. in water (20 °C): almost non-miscible
- Melting point: < -100 °C
- Boiling point: 40 - 60 °C
- Flash point: < -21 °C
- Ignition temp.: 250 °C
- Vapour pressure: (20 °C) 350 hPa
- Viscosity: (20 °C) 0,45 mPas
- Expl. limit (upper): 8 Vol%
- Expl. limit (lower): 0,8 Vol%

Toxicological data:
- LD 50 (oral, rat): > 5000 mg/kg
- MAK: 50 ml/m³ , 180 mg/m³
- WGK: 1

Safety:
- EC Index no.: 649-328-00-1
- R: 11-52/53-65
- S: 9-16-23.2-51-24-33-46-62
- VbF class: AI
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1268
- IMDG: 3 II UN 1268
- IATA/ICAO: 3 II UN 1268
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

ET0095 Petroleum ether, boiling range 40 - 60 °C, Multisolvent® HPLC grade ACS ISO UV-VIS

Taric code: 2710 11 25 00

colour (Hazen)	max. 10
density (20°/4°)	0,640 - 0,655
appearance	clear
boiling range (40 - 60 °C)	min. 90 % vol
acidity	max. 0,0003 meq/g
iodine index	max. 0,3
peroxide index	max. 0,3
aluminium (Al)	max. 0,00001 %
barium (Ba)	max. 0,000001 %
boron (B)	max. 0,000002 %
cadmium (Cd)	max. 0,000001 %
calcium (Ca)	max. 0,00003 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,000002 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000001 %
nickel (Ni)	max. 0,000002 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,000001 %
aromatic compounds (as benzene)	max. 0,005 %
sulphur compounds (as S)	max. 0,005 %
substances darkened by H_2SO_4	passes test
non-volatile matter	max. 0,0002 %
water (K.F.)	max. 0,01 %

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
200 nm	20 %	0,699 AU
210 nm	50 %	0,301 AU
230 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
ET00951000	1 l
ET00952500	2,5 l
ET00954000	4 l
ET0095007E	7 l
ET0095025S	25 l

Potassium dihydrogen phosphate

Potassium biphosphate, Potassium phosphate monobasic, Primary potassium phosphate, Mono-potassium phosphate
- KH_2PO_4 • M = 136,09 g/mol
- CAS [7778-77-0]
- EC number: 231-913-4

Physical data:
- Spec. density: 2,34 g/cm³
- Bulk density: ~ 1200 kg/m³
- Solub. in water (20 °C): 222 g/l
- Melting point: ~ 253 °C (decomposes)
- pH (50 g/l H_2O, 20 °C) ~ 4,4

Toxicological data:
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 14

PO0261 Potassium dihydrogen phosphate, HPLC grade

Tanic code: 2835 24 00 00

assay (acidimetric)	min. 99,5 %
identity (IR-spectrum)	passes test
insoluble matter	passes test
pH (5%, H_2O)	4,2 - 4,5
chlorides (Cl)	max. 0,0005 %
heavy metals (as Pb)	max. 0,0005 %
iron (Fe)	max. 0,0005 %

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at wavelength:	absorbance:
210 nm	0,1 AU
220 nm	0,06 AU
230 nm	0,04 AU
300 nm	0,02 AU

Code	Capacity
PO02610250	250 g

di-Potassium hydrogen phosphate trihydrate

Secondary potassium phosphate, Potassium phosphate dibasic
- $K_2HPO_4 \cdot 3H_2O$ • M = 228,23 g/mol
- CAS [16788-57-1]
- EC number: 231-834-5

Physical data:
- Bulk density: ~ 800 kg/m³
- Solub. in water (20 °C): freely soluble
- pH (50 g/l H_2O, 20 °C) 9,2 - 9,4

Toxicological data:
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 14

PO0270 di-Potassium hydrogen phosphate trihydrate, HPLC grade

Tanic code: 2835 24 00 00

assay (acidimetric)	min. 99 %
identity (IR-spectrum)	passes test
insoluble matter	passes test
pH (5%, H_2O)	9,2 - 9,4

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at wavelength:	absorbance:
230 nm	0,1 AU
240 nm	0,06 AU
250 nm	0,04 AU
310 nm	0,02 AU

Code	Capacity
PO02700250	250 g
PO02701000	1 kg

1-Propanol

F Xi

n-Propyl alcohol, Ethylcarbinol, 1-Hydroxypropane, n-Propanol

- C_3H_8O • M = 60,10 g/mol
- CAS [71-23-8]
- EC number: 200-746-9

Physical data:
- Density: 0,80 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -127 °C
- Boiling point: 96,5 - 98 °C
- Flash point: 15 °C
- Ignition temp.: 405 °C
- Vapour pressure: (20 °C) 19 hPa
- Viscosity: (20 °C) 2,75 mPas
- Dipolar moment: (20 °C) 1,7 Debye
- Dielectric const.: (25 °C) 20,1
- Saturation conc.: (20 °C) 46 g/m³
- Expl. limit (upper): 13,5 Vol%
- Expl. limit (lower): 2,1 Vol%
- pH (200 g/l H_2O, 20 °C) 7

Toxicological data:
- LD 50 (oral, rat): 1870 mg/kg
- WGK: 1

Safety:
- EC Index no.: 603-003-00-0
- R: 11-41-67
- S: 7-16-24-26-39
- VbF class: B
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1274
- IMDG: 3 II UN 1274
- IATA/ICAO: 3 II UN 1274
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

AL0438 1-Propanol, HPLC grade

Tanic code: 2905 12 00 00

assay (G.C.)	min. 99,9 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,803 - 0,804
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,05 %

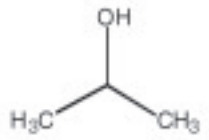
min. transmission/max. absorbance in a 1,0 cm cell at wavelength:	T(%)	A (AU)
210 nm	20 %	0,699 AU
220 nm	50 %	0,301 AU
250 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AL04381000	1 l
AL04382500	2,5 l
AL0438007E	7 l
AL0438025S	25 l

2-Propanol

F Xi



Isopropyl alcohol, iso-Propyl alcohol, Isopropanol, iso-Propanol, Dimethylcarbinol, 2-Hydroxypropane

- C_3H_8O • M = 60,10 g/mol
- CAS [67-63-0]
- EC number: 200-661-7

Physical data:
- Density: 0,78 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: -89,5 °C
- Boiling point: 82,4 °C
- Flash point: 12 °C
- Ignition temp.: 425 °C
- Vapour pressure: (20 °C) 43 hPa
- Viscosity: (20 °C) 2,27 mPas
- Dipolar moment: (20 °C) 1,66 Debye
- Dielectric const.: (25 °C) 18,3
- Saturation conc.: (20 °C) 105 g/m³
- Expl. limit (upper): 12,7 Vol%
- Expl. limit (lower): 2 Vol%
- pH (20 °C) ~ 7

Toxicological data:
- LD 50 (oral, rat): 5045 mg/kg
- MAK: 200 ml/m³, 500 mg/m³
- WGK: 1

Safety:
- EC Index no.: 603-117-00-0
- R: 11-36-67
- S: 7-16-24/25-26
- VbF class: B
- Poison class CH (Swiss): F

Transport/storage:
- ADR: 3 F1 II UN 1219
- IMDG: 3 II UN 1219
- IATA/ICAO: 3 II UN 1219
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

AL0321 2-Propanol, Multisolvent® HPLC grade ACS ISO UV-VIS

Tanic code: 2905 12 00 00

assay (G.C.)	min. 99,8 %	platinum (Pt)	max. 0,000002 %
identity (IR-spectrum)	passes test	silver (Ag)	max. 0,000002 %
density (20°/4°)	0,784 - 0,785	thallium (Tl)	max. 0,000002 %
appearance	clear	tin (Sn)	max. 0,00001 %
colour (Hazen)	max. 10	titanium (Ti)	max. 0,000002 %
solubility in water	passes test	vanadium (V)	max. 0,000002 %
acidity	max. 0,0001 meq/g	zinc (Zn)	max. 0,000001 %
alkalinity	max. 0,0001 meq/g	zirconium (Zr)	max. 0,000002%
chlorides (Cl)	max. 0,00003 %	acetone (G.C.)	max. 0,01 %
nitrates (NO_3)	max. 0,00003 %	ethanol (G.C.)	max. 0,01 %
phosphates (PO_4)	max. 0,00005 %	isopropylether (G.C.)	max. 0,01 %
sulfates (SO_4)	max. 0,0001 %	methanol (G.C.)	max. 0,01 %
aluminium (Al)	max. 0,00001 %	n-propanol (G.C.)	max. 0,1 %
antimony (Sb)	max. 0,000002 %	carbonyl compounds (as CO)	max. 0,002 %
arsenic (As)	max. 0,000002 %	$KMnO_4$ red. matter	max. 0,0002 %
barium (Ba)	max. 0,000001 %	substances darkened by H_2SO_4	passes test
beryllium (Be)	max. 0,000002 %	non-volatile matter	max. 0,0002 %
bismuth (Bi)	max. 0,00001 %	water (K.F.)	max. 0,05 %
boron (B)	max. 0,000002 %		
cadmium (Cd)	max. 0,000001 %	liquid chromatography suitability	
calcium (Ca)	max. 0,00001 %	absorbance	passes test
chromium (Cr)	max. 0,000002 %		
cobalt (Co)	max. 0,000002 %	min. transmission/max. absorbance	
copper (Cu)	max. 0,000002 %	in a 1,0 cm cell at	
gallium (Ga)	max. 0,000002 %	wavelength:	T(%) A (AU)
gold (Au)	max. 0,000002 %	207 nm	10 % 1,000 AU
indium (In)	max. 0,000002 %	217 nm	50 % 0,301 AU
iron (Fe)	max. 0,00001 %	232 nm	80 % 0,097 AU
lead (Pb)	max. 0,00001 %	242 nm	90 % 0,046 AU
magnesium (Mg)	max. 0,000002 %	260 nm	98 % 0,009 AU
manganese (Mn)	max. 0,000002 %		
molybdenum (Mo)	max. 0,000002 %	Microfiltered through membranes	
nickel (Ni)	max. 0,000002 %	of pore diameter 0,22 µm	

Code	Capacity
AL03211000	1 l
AL03212500	2,5 l
AL03214000	4 l
AL0321007E	7 l
AL0321025S	25 l

NEW AL0326 2-Propanol, LC-MS

Tanic code: 2905 12 00 00

assay (G.C.)	min. 99,9 %	tin (Sn)	max. 0,00001 %
identity (IR-spectrum)	passes test	zinc (Zn)	max. 0,00001 %
density (20°/4°)	0,784 - 0,785	non-volatile matter	max. 0,0005 %
acidity	max. 0,0001 meq/g	water (K.F.)	max. 0,05 %
aluminium (Al)	max. 0,00005 %	suitability for use in LC-MS	passes test
barium (Ba)	max. 0,00001 %		
cadmium (Cd)	max. 0,000005 %	min. transmission/max. absorbance	
calcium (Ca)	max. 0,00001 %	in a 1,0 cm cell at	
chromium (Cr)	max. 0,000002 %	wavelength:	T(%) A (AU)
cobalt (Co)	max. 0,000002 %	210 nm	20 % 0,699 AU
copper (Cu)	max. 0,000002 %	215 nm	50 % 0,301 AU
iron (Fe)	max. 0,00001 %	240 nm	90 % 0,046 AU
lead (Pb)	max. 0,00001 %		
magnesium (Mg)	max. 0,00001 %	gradient grade (254 nm)	
manganese (Mn)	max. 0,000002 %	maximum peak absorbance	max. 0,005 AU
nickel (Ni)	max. 0,000002 %		
potassium (K)	max. 0,00001 %	microfiltered through membranes	
silver (Ag)	max. 0,00001 %	of pore diameter 0,22 µm	
sodium (Na)	max. 0,00001 %		

Code	Capacity
AL03261000	1 l
AL03262500	2,5 l

AL0315 2-Propanol, gradient HPLC grade

Tanic code: 2905 12 00 00

assay (G.C.)	min. 99,8 %
identity (IR-spectrum)	passes test
density (20°/4°)	0,784 - 0,785
acidity	max. 0,0002 meq/g
alkalinity	max. 0,0002 meq/g
non-volatile matter	max. 0,0003 %
water (K.F.)	max. 0,05 %

gradient grade (240 nm)

maximum background absorbance:	0,025 AU
maximum peak absorbance:	0,002 AU

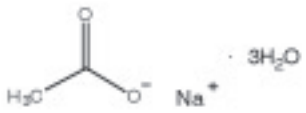
min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T[%]	A (AU)
210 nm	20 %	0,699 AU
215 nm	50 %	0,301 AU
240 nm	90 %	0,046 AU

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
AL03151000	1 l
AL03152500	2,5 l
AL0315007E	7 l
AL0315025S	25 l

Sodium acetate trihydrate



Acetic acid sodium salt trihydrate
- $CH_3COONa\ 3H_2O$ • M = 136,08 g/mol
- CAS [6131-90-4]
- EC number: 204-823-8

Physical data:
- Spec. density: 1,42 g/cm³
- Bulk density: ~ 900 kg/m³
- Solub. in water (20 °C): 613 g/l
- Melting point: 58 °C
- Boiling point: > 400 °C (anhydrous substance) (decomposes)
- Flash point: > 250 °C (anhydrous substance)
- Ignition temp.: 607 °C
- pH (50 g/l H_2O, 20 °C) 7,5 - 9,2

Toxicological data:
- LD 50 (oral, rat): 3530 mg/kg (anhydrous substance)
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 14

SO0030 Sodium acetate trihydrate, HPLC grade

Tanic code: 2915 22 00 00

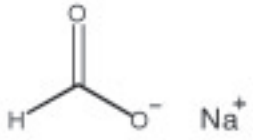
assay (titr. with $HClO_4$)	min. 99,5 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
250 nm	0,05 AU
260 nm	0,01 AU

Code	Capacity
SO00300250	250 g
SO00301000	1 kg

Sodium formate



Formic acid, sodium salt
- NaCOOH • M = 68,01 g/mol
- CAS [141-53-7]
- EC number: 205-488-0

Physical data:
- Spec. density: 1,92 g/cm³
- Bulk density: 635 kg/m³
- Solub. in water (20 °C): 820 g/l
- Melting point: 255 °C
- pH (50 g/l H_2O, 25 °C) 7,0 - 8,5

Toxicological data:
- LD 50 (oral, rat): 11200 mg/kg
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 3

SO0325 Sodium formate, HPLC grade

Tanic code: 2915 12 00 00

assay (iodometric)	min. 99,5 %
identity (IR-spectrum)	passes test
insoluble matter	passes test
pH (5%, H_2O)	7,0 - 8,5
heavy metals (as Pb)	max. 0,0005 %
iron (Fe)	max. 0,0005 %

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
260 nm	0,05 AU
270 nm	0,04 AU
300 nm	0,03 AU
330 nm	0,02 AU

Code	Capacity
SO03250250	250 g

Sodium hydrogen carbonate

Sodium bicarbonate
- $NaHCO_3$ • M = 84,01 g/mol
- CAS [144-55-8]
- EC number: 205-633-8

Physical data:
- Spec. density: 2,22 g/cm³
- Bulk density: ~ 1000 kg/m³
- Solub. in water (20 °C): 95,5 g/l
- Melting point: 270 °C (decomposes)
- Vapour pressure: (30 °C) 8,3 hPa
- pH (50 g/l H_2O, 20 °C) ≤ 8,6

Toxicological data:
- LD 50 (oral, rat): 4220 mg/kg
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 14

SO0130 Sodium hydrogen carbonate, HPLC grade

Tanic code: 2836 30 00 00

assay (acidimetric)	min. 99,5 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at

wavelength:	absorbance:
240 nm	0,1 AU
250 nm	0,04 AU
260 nm	0,02 AU
280 nm	0,01 AU

Code	Capacity
SO01300250	250 g

di-Sodium hydrogen phosphate dihydrate

Sodium monohydrogen phosphate, Sodium phosphate dibasic, Secondary sodium phosphate
- $Na_2HPO_4 \cdot 2H_2O$ • M = 177,99 g/mol
- CAS [10028-24-7]
- EC number: 231-448-7

Physical data:
- Spec. density: 2,1 g/cm³
- Bulk density: ~ 850 - 1000 kg/m³
- Solub. in water (20 °C): 93 g/l
- Melting point: 92,5 °C (release of crystaline water)
- pH (50 g/l H_2O, 20 °C) ~ 9,1 - 9,4

Toxicological data:
- LD 50 (oral, rat): 17000 mg/kg (anhydrous substance)
- WGK: 1

Safety:
- Poison class CH (Swiss): 5

Transport/storage:
- LGK: 10-13
- Disposal: 14

SO0345 di-Sodium hydrogen phosphate dihydrate, HPLC grade

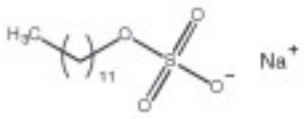
Taric code: 2835 22 00 00

assay (acidimetric)	min. 99,5 %	lead (Pb)	max. 0,001 %
identity (IR-spectrum)	passes test	potassium (K)	max. 0,05 %
insoluble matter	passes test		
pH (5%, H_2O)	9,0 - 9,2	maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at	
total N	max. 0,001 %	wavelength:	absorbance:
chlorides (Cl)	max. 0,001 %	230 nm	0,1 AU
sulfates (SO_4)	max. 0,005 %	260 nm	0,06 AU
copper (Cu)	max. 0,0003 %	280 nm	0,04 AU
heavy metals (as Pb)	max. 0,001 %	320 nm	0,02 AU
iron (Fe)	max. 0,001 %		

Code	Capacity
SO03450250	250 g

Sodium lauryl sulfate

Xn



Dodecyl sulfate sodium salt, SDS
- $C_{12}H_{25}NaO_4S$ • M = 288,38 g/mol
- CAS [151-21-3]
- EC number: 205-788-1

Physical data:
- Spec. density: 1,1 g/cm³
- Bulk density: ~ 490 - 560 kg/m³
- Solub. in water (20 °C): ~ 150 g/l
- Melting point: 204 - 207 °C
- Flash point: > 100 °C
- pH (10 g/l H_2O, 20 °C) 7,5 - 9,0

Toxicological data:
- LD 50 (oral, rat): 1288 mg/kg
- WGK: 2

Safety:
- R: 22-36/38
- S: 46
- Poison class CH (Swiss): 4

Transport/storage:
- LGK: 10-13

SO0456 Sodium lauryl sulfate, for ion-pair chromatography

Taric code: 2920 90 10 90

assay (complexometric, referred to anhydrous substance)	min. 99 %	maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at	
identity (IR-spectrum)	passes test	wavelength:	absorbance:
insoluble matter	passes test	210 nm	0,1 AU
pH (10%, H_2O)	6,0 - 7,5	220 nm	0,06 AU
loss on drying (120 °C)	max. 2 %	230 nm	0,04 AU
		260 nm	0,02 AU

Code	Capacity
SO04560025	25 g
SO04560100	100 g

Tetrabutylammonium bromide

TBAB, Tetra-n-butylammonium bromide
- $C_{16}H_{36}BrN$ • M = 322,38 g/mol
- CAS [1643-19-2]
- EC number: 216-699-2

Physical data:
- Bulk density: 700 kg/m³
- Solub. in water (20 °C): 600 g/l
- Melting point: 100 - 103 °C

Toxicological data:
- WGK: 3

Transport/storage:
- LGK: 10-13
- Disposal: 3

BR0200 Tetrabutylammonium bromide, HPLC grade

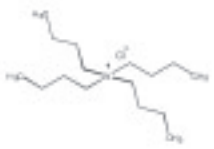
Taric code: 2923 90 00 90

assay (argentometric)	min. 99 %	maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at	
identity (IR-spectrum)	passes test	wavelength:	absorbance:
insoluble matter	passes test	240 nm	0,04 AU
		250 nm	0,03 AU
		260 nm	0,02 AU

Code	Capacity
BR02000025	25 g

Tetrabutylammonium chloride

Xi



- $C_{16}H_{36}ClN$ • M = 277,93 g/mol
- CAS [1112-67-0]
- EC number: 214-195-7

Physical data:
- Density: 1 g/cm³
- Solub. in water (20 °C): miscible
- Melting point: 25 °C
- Flash point: 110 °C
- pH (100 g/l H_2O, 20 °C) 5 - 8

Toxicological data:
- WGK: 3

Safety:
- R: 36/38

Transport/storage:
- LGK: 10-13

TE0118 Tetrabutylammonium chloride, HPLC grade

Tanic code: 2923 90 00 90

assay (argentometric, referred to anhydrous substance)	min 99 %
identity (IR-spectrum)	passes test
insoluble matter	passes test
water (K.F.)	max. 4 %

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at wavelength:	absorbance:
220 nm	0,05 AU
230 nm	0,04 AU
250 nm	0,03 AU
260 nm	0,02 AU

Code	Capacity
TE01180010	10 g

Tetrabutylammonium hydroxide, solution 0,1 mol/l

- $C_{16}H_{37}NO$ • M = 259,48 g/mol
- CAS [2052-49-5]
- EC number: 218-147-6

Physical data:
- Solub. in water (20 °C): miscible
- pH (20 °C) 7,4 - 7,6

TE0115 Tetrabutylammonium hydroxide, solution 0,1 mol/l, buffered with phosphates, HPLC grade

Tanic code: 2923 90 00 90

pH (20 °C)	7,4 - 7,6
absorbance of a 0,005 M solution in a 1 cm cell at 254 nm	max. 0,02 AU

Code	Capacity
TE01150250	250 ml
TE01151000	1 l

Tetrabutylammonium hydrogen sulfate

- $C_{16}H_{37}NO_4S$ • M = 339,54 g/mol
- CAS [32503-27-8]
- EC number: 251-068-5

Physical data:
- Bulk density: 650 kg/m³
- Solub. in water (20 °C): freely soluble
- Melting point: 169 - 172 °C
- pH (50 g/l H_2O, 20 °C) 2,1

Toxicological data:
- WGK: 3

Transport/storage:
- LGK: 10-13
- Disposal: 3

TE0120 Tetrabutylammonium hydrogen sulfate, for ion-pair chromatography

Tanic code: 2923 90 00 90

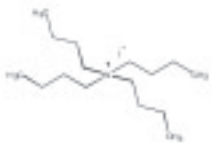
assay (acidimetric)	min. 99 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of an aqueous solution (10%) in a 1,0 cm cell at wavelength:	absorbance:
210 nm	0,05 AU
220 nm	0,04 AU
230 nm	0,03 AU
250 nm	0,02 AU

Code	Capacity
TE01200010	10 g
TE01200100	100 g

Tetrabutylammonium iodide

Xn



- $C_{16}H_{36}IN$ • M = 369,38 g/mol
- CAS [311-28-4]
- EC number: 206-220-5

Physical data:
- Solub. in water (20 °C): slightly soluble
- Melting point: 143 - 146 °C

Toxicological data:
- LD 50 (oral, rat): 1990 mg/kg
- WGK: 2

Safety:
- R: 22
- S: 46

Transport/storage:
- LGK: 10-13
- Disposal: 3

TE0130 Tetrabutylammonium iodide, HPLC grade

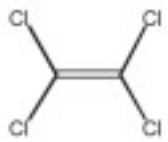
Tanic code: 2923 90 00 90

assay (argentometric)	min. 99 %
identity (IR-spectrum)	passes test
insoluble matter	passes test

maximum absorbance of a solution in acetonitrile (10%) in a 1,0 cm cell at wavelength:	absorbance:
290 nm	0,1 AU
300 nm	0,05 AU
320 nm	0,02 AU

Code	Capacity
TE01300010	10 g

Tetrachloroethene



Perchloroethylene, Tetrachloroethylene, Ethylene tetrachloride
- C_2Cl_4 • M = 165,82 g/mol
- CAS [127-18-4]
- EC number: 204-825-9

Physical data:
- Density: 1,62 g/cm³
- Solub. in water (20 °C): 0,2 g/l
- Melting point: -22 °C
- Boiling point: 121 °C
- Vapour pressure: (20 °C) 18 hPa
- Refraction index: (n 20 °C/D) 1,5053
- Viscosity: (20 °C) 0,89 mPas
- Dielectric const.: (20 °C) 2,4
- Saturation conc.: (20 °C) 126 g/m³

Toxicological data:
- LD 50 (oral, rat): 2629 mg/kg
- WGK: 3

Safety:
- EC Index no.: 602-028-00-4
- R: 40-51/53
- S: 23.2-51-36/37-61
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 6.1 T1 III UN 1897
- IMDG: 6.1 III UN 1897
- IATA/ICAO: 6.1 III UN 1897
- PAX: 605
- CAO: 612
- LGK: 10-13
- Disposal: 2

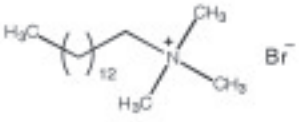
TE0127 Tetrachloroethene, Multisolvent® HPLC grade UV-VIS

Taric code: 2903 23 00 00

assay (G.C.)	min. 99,9 %	nickel (Ni)	max. 0,000002 %
identity (IR-spectrum)	passes test	tin (Sn)	max. 0,00001 %
density (20°/4°)	1,621 - 1,623	zinc (Zn)	max. 0,000001 %
appearance	clear	non-volatile matter	max. 0,0003 %
colour (Hazen)	max. 10	water (K.F.)	max. 0,01 %
acidity	max. 0,0005 meq/g		
aluminium (Al)	max. 0,00001 %	min. transmission/max. absorbance	
barium (Ba)	max. 0,000001 %	in a 1,0 cm cell at	
boron (B)	max. 0,000002 %	wavelength:	T[%] A (AU)
cadmium (Cd)	max. 0,000001 %	290 nm	10 % 1,000 AU
calcium (Ca)	max. 0,00003 %	295 nm	50 % 0,301 AU
chromium (Cr)	max. 0,000002 %	300 nm	80 % 0,097 AU
cobalt (Co)	max. 0,000002 %	305 nm	85 % 0,071 AU
copper (Cu)	max. 0,000002 %	350 nm	89 % 0,051 AU
iron (Fe)	max. 0,000002 %		
lead (Pb)	max. 0,00001 %	Microfiltered through membranes	
magnesium (Mg)	max. 0,00001 %	of pore diameter 0,22 µm	
manganese (Mn)	max. 0,000001 %		

Code	Capacity
TE01271000	1 l

Tetradecyltrimethylammonium bromide



Myristyltrimethylammonium bromide, N,N,N-Trimethyl-1-tetradecanaammonium bromide
- $C_{17}H_{38}BrN$ • M = 336,08 g/mol
- CAS [1119-97-7]
- EC number: 214-291-9

Physical data:
- Bulk density: ~ 600 kg/m³
- Solub. in water (20 °C): 100 g/l
- Melting point: 245 - 250 °C

Safety:
- R: 34
- S: 26-36/37/39-45

Transport/storage:
- ADR: 8 C10 III UN 1759
- IMDG: 8 III UN 1759
- IATA/ICAO: 8 III UN 1759
- PAX: 822
- CAO: 823
- LGK: 8

BR0201 Tetradecyltrimethylammonium bromide, HPLC grade

Taric code: 2923 90 00 90

assay (argentometric)	min. 96 %	maximum absorbance of an aqueous	
identity (IR-spectrum)	passes test	solution (10%) in a 1,0 cm cell at	
insoluble matter	passes test	wavelength:	absorbance:
		240 nm	0,04 AU
		250 nm	0,03 AU
		260 nm	0,02 AU

Code	Capacity
BR02010025	25 g

Tetrahydrofuran

F Xi

THF, Tetramethylene oxide, Oxolane
- C_4H_8O • M = 72,11 g/mol
- CAS [109-99-9]
- EC number: 203-726-8

Physical data:
- Density: 0,89 g/cm³
- Solub. in water (20 ºC): miscible
- Melting point: -108,5 ºC
- Boiling point: 65 - 66 ºC
- Flash point: -21,5 ºC
- Ignition temp.: 215 ºC
- Vapour pressure: (20ºC) 173 hPa
- Refraction index: [n 20 ºC/D) 1,407
- Viscosity: (20 ºC) 0,47 mPas
- Dipolar moment: (20 ºC) 1,63 Debye
- Dielectric const.: (20 ºC) 7,4
- Saturation conc.: (20 ºC) 557 g/m³
- Expl. limit (upper): 12,4 Vol%
- Expl. limit (lower): 1,5 Vol%
- pH (200 g/l H_2O, 20 ºC) 7 - 8

Toxicological data:
- LD 50 (oral, rat): 1650 mg/kg
- MAK: 50 ml/m³, 150 mg/m³
- WGK: 1

Safety:
- EC Index no.: 603-025-00-0
- R: 11-19-36/37
- S: 16-29-33
- VbF class: B
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 3 F1 II UN 2056
- IMDG: 3 II UN 2056
- IATA/ICAO: 3 II UN 2056
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

TE0228 **Tetrahydrofuran**, Multisolvent® GPC grade ACS, stabilized with 250 ppm of 2,6-Di-tert-butyl-4-methylphenol (BHT)

Taric code: 2932 11 00 90

assay (G.C.)	min. 99,9 %	cobalt (Co)	max. 0,000002 %
identity (IR-spectrum)	passes test	copper (Cu)	max. 0,000002 %
density (20ºI4ª)	0,887 - 0,889	iron (Fe)	max. 0,000002 %
appearance	clear	lead (Pb)	max. 0,00001 %
colour (Hazen)	max. 10	magnesium (Mg)	max. 0,000001 %
acidity	max. 0,0003 meq/g	manganese (Mn)	max. 0,000001 %
alkalinity	max. 0,0002 meq/g	nickel (Ni)	max. 0,000002 %
aluminium (Al)	max. 0,00001 %	tin (Sn)	max. 0,00001 %
barium (Ba)	max. 0,000001 %	zinc (Zn)	max. 0,000001 %
boron (B)	max. 0,000002 %	peroxides (as H_2O_2)	max. 0,005 %
cadmium (Cd)	max. 0,000001 %	non-volatile matter	max. 0,0003 %
calcium (Ca)	max. 0,00003 %	water (K.F.)	max. 0,02 %
chromium (Cr)	max. 0,000002 %		

Code	Capacity
TE02281000	1 l
TE02282500	2,5 l
TE02284000	4 l
TE0228007E	7 l
TE0228025S	25 l

TE0225 **Tetrahydrofuran**, HPLC grade, without stabilizer

Taric code: 2932 11 00 90

assay (G.C.)	min. 99,9 %	min. transmission/max. absorbance in a 1,0 cm cell at		
identity (IR-spectrum)	passes test	wavelength:	T[%]	A (AU)
density (20ºI4ª)	0,887 - 0,889	230 nm	20 %	0,699 AU
acidity	max. 0,0002 meq/g	243 nm	50 %	0,301 AU
alkalinity	max. 0,0002 meq/g	273 nm	90 %	0,046 AU
non-volatile matter	max. 0,0003 %			
water (K.F.)	max. 0,02 %			

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
TE02251000	1 l
TE02252500	2,5 l

Toluene

F Xn

Methylbenzene, Phenylmethane
- C_7H_8 • M = 92,14 g/mol
- CAS [108-88-3]
- EC number: 203-625-9

Physical data:
- Density: 0,87 g/cm³
- Solub. in water (20 °C): 0,52 g/l
- Melting point: -95 °C
- Boiling point: 111 °C
- Flash point: 4 °C
- Ignition temp.: 535 °C
- Vapour pressure: (20 °C) 29 hPa
- Viscosity: (20 °C) 0,58 mPas
- Dipolar moment: (20 °C) 0,36 Debye
- Dielectric const.: (25 °C) 2,3
- Saturation conc.: (20 °C) 110 g/m³
- Expl. limit (upper): 8 Vol%
- Expl. limit (lower): 1,2 Vol%

Toxicological data:
- LD 50 (oral, rat): 636 mg/kg
- MAK: 50 ml/m³, 190 mg/m³
- WGK: 2

Safety:
- EC Index no.: 601-021-00-3
- R: 11-38-48/20-63-65-67
- S: 23.2-36/37-62
- VbF class: AI
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 3 F1 II UN 1294
- IMDG: 3 II UN 1294
- IATA/ICAO: 3 II UN 1294
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

TO0085 Toluene, Multisolvent® HPLC grade ACS ISO UV-VIS

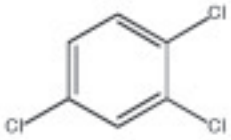
Taric code: 2902 30 00 00

assay (G.C.)	min. 99,9 %	nickel (Ni)	max. 0,000002 %
identity (IR-spectrum)	passes test	platinum (Pt)	max. 0,000002 %
density (20°/4°)	0,863 - 0,866	silver (Ag)	max. 0,000002 %
appearance	clear	thallium (Tl)	max. 0,000005 %
colour (Hazen)	max. 10	tin (Sn)	max. 0,00001 %
acidity	max. 0,0002 meq/g	titanium (Ti)	max. 0,000005 %
alkalinity	max. 0,0002 meq/g	vanadium (Va)	max. 0,000005 %
chlorides (Cl)	max. 0,00005 %	zinc (Zn)	max. 0,000001 %
sulfates (SO4)	max. 0,0001 %	zirconium (Zr)	max. 0,000002 %
aluminium (Al)	max. 0,00001 %	benzene (G.C.)	max. 0,005 %
antimony (Sb)	max. 0,000002 %	sulphur compounds (as S)	max. 0,003 %
arsenic (As)	max. 0,000002 %	thiophene	max. 0,0001 %
barium (Ba)	max. 0,000001 %	substances darkened by H_2SO_4	passes test
beryllium (Be)	max. 0,000002 %	non-volatile matter	max. 0,0002 %
bismuth (Bi)	max. 0,00001 %	water (K.F.)	max. 0,02 %
boron (B)	max. 0,000002 %		
cadmium (Cd)	max. 0,000001 %	liquid chromatography suitability	
calcium (Ca)	max. 0,00003 %	absorbance	passes test
chromium (Cr)	max. 0,000002 %		
cobalt (Co)	max. 0,000002 %	min. transmission/max. absorbance	
copper (Cu)	max. 0,000002 %	in a 1,0 cm cell at	
gallium (Ga)	max. 0,000002 %	wavelength:	T(%) A (AU)
gold (Au)	max. 0,00001 %	285 nm	10 % 1,000 AU
indium (In)	max. 0,000002 %	292 nm	50 % 0,301 AU
iron (Fe)	max. 0,00001 %	305 nm	80 % 0,097 AU
lead (Pb)	max. 0,00001 %	317 nm	90 % 0,046 AU
lithium (Li)	max. 0,000002 %	350 nm	98 % 0,009 AU
magnesium (Mg)	max. 0,00001 %		
manganese (Mn)	max. 0,000001 %	Microfiltered through membranes	
molybdenum (Mo)	max. 0,000005 %	of pore diameter 0,22 µm	

Code	Capacity
TO0085100O	1 l
TO0085250O	2,5 l
TO0085400O	4 l
TO0085007E	7 l
TO0085025S	25 l

1,2,4-Trichlorobenzene

Xn N



- $C_6H_3Cl_3$ • M = 181,45 g/mol
- CAS [120-82-1]
- EC number: 204-428-0

Physical data:
- Density: 1,45 g/cm³
- Solub. in water (20 °C): 0,049 g/l
- Melting point: 17 °C
- Boiling point: 213,5 °C
- Flash point: 99 °C
- Ignition temp.: 571 °C
- Vapour pressure: (20 °C) 1,3 hPa
- Saturation conc.: (20 °C) 2 g/m³
- Expl. limit (upper): 6,6 Vol %
- Expl. limit (lower): 2,5 Vol %

Toxicological data:
- LD 50 (oral, rat): 756 mg/kg
- WGK: 3

Safety:
- R: 22-36/37/38-51/53
- S: 25-46-61
- Poison class CH (Swiss): 4

Transport/storage:
- ADR: 6.1 T1 III UN 2321
- IMDG: 6.1 III UN 2321
- IATA/ICAO: 6.1 III UN 2321
- PAX: 611
- CAO: 618
- LGK: 10-13
- Disposal: 2

TR0120 1,2,4-Trichlorobenzene, HPLC grade

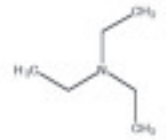
Taric code: 2903 69 90 90

assay (G.C.)	min. 99 %	min. transmission/max. absorbance	
identity (IR-spectrum)	passes test	in a 1,0 cm cell at	
acidity	max. 0,0002 meq/g	wavelength:	T(%) A (AU)
alkalinity	max. 0,0002 meq/g	310 nm	60 % 0,222 AU
sulfated ash	max. 0,001 %	315 nm	80 % 0,097 AU
water (K.F.)	max. 0,01 %	385 nm	98 % 0,009 AU
		Microfiltered through membranes	
		of pore diameter 0,22 µm	

Code	Capacity
TR0120100O	1 l
TR0120250O	2,5 l

Triethylamine

F C



N,N-Diethylethanamine
- $C_6H_{15}N$ • M = 101,19 g/mol
- CAS [121-44-8]
- EC number: 204-469-4

Physical data:
- Density: 0,73 g/cm³
- Solub. in water (20 °C): 133 g/l
- Melting point: -115 °C
- Boiling point: 90 °C
- Flash point: -11 °C
- Ignition temp.: 215 °C
- Vapour pressure: (20 °C) 69 hPa
- Saturation conc.: (20 °C) 256 g/m³
- Expl. limit (upper): 9,3 Vol%
- Expl. limit (lower): 1,2 Vol%
- pH (100 g/l H_2O, 15 °C) 12,7

Toxicological data:
- LD 50 (oral, rat): 460 mg/kg
- MAK: 1 ml/m³, 4,2 mg/m³
- WGK: 1

Safety:
- EC Index no.: 612-004-00-5
- R: 11-20/21/22-35
- S: 3-16-26-29-36/37/39-45
- VbF class: B
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 3 FC II UN 1296
- IMDG: 3 II UN 1296
- IATA/ICAO: 3 II UN 1296
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 5

TR0218 Triethylamine, HPLC grade

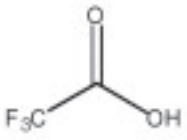
Taric code: 2921 19 10 00

assay (acidimetric)	min. 99,7 %	heavy metals (as Pb)	max. 0,0001 %
identity (IR-spectrum)	passes test	iron (Fe)	max. 0,0001 %
density (20°/4°)	0,726 - 0,729	UV absorbance at 285 nm	max. 0,01 AU
chlorides (Cl)	max. 0,001 %	non-volatile matter	max. 0,001 %
sulfates (SO_4)	max. 0,001 %	water (K.F.)	max. 0,1 %

Code	Capacity
TR02181000	1 l
TR02182500	2,5 l

Trifluoroacetic acid

C



Perfluoroacetic acid, TFA
- CF_3COOH • M = 114,02 g/mol
- CAS [76-05-1]
- EC number: 200-929-3

Physical data:
- Density: 1,48 g/cm³
- Solub. in water (20 °C): freely miscible
- Melting point: -15 °C
- Boiling point: 72 °C
- Vapour pressure: (20 °C) 11 hPa
- Viscosity: (20 °C) 0,91 mPas
- Dielectric const.: (25 °C) 42,1
- Evap. heat: (72 °C) 282 KJ/kg
- pH (20 °C) < 1

Toxicological data:
- WGK: 2

Safety:
- EC Index no.: 607-091-00-1
- R: 20-35-52/53
- S: 9-26-27-28.1-45-61
- Poison class CH (Swiss): 3

Transport/storage:
- ADR: 8 C3 I UN 2699
- IMDG: 8 I UN 2699
- IATA/ICAO: 8 I UN 2699
- PAX: 807
- CAO: 809
- LGK: 8 B
- Disposal: 4

NEW AC3143 Trifluoroacetic acid, buffer substance, HPLC grade

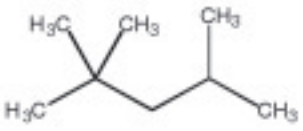
Taric code: 2915 90 80 90

assay (acidimetric)	min. 99,5 %	maximum absorbance in a 1,0 cm cell at wavelength:	absorbance:
gradient elution	passes test	260 nm	0,9 AU
water (K.F.)	max. 0,05 %	270 nm	0,1 AU
		280 nm	0,05 AU
		290 nm	0,04 AU
		300 nm	0,03 AU
		320 nm	0,025 AU

Code	Capacity
AC31430100	100 ml

2,2,4-Trimethylpentane

F Xn N



Isooctane, Isobutyltrimethylmethane, iso-Octane
- C_8H_{18} • M = 114,26 g/mol
- CAS [540-84-1]
- EC number: 208-759-1

Physical data:
- Density: 0,69 g/cm³
- Solub. in water (25 °C): 0,56 mg/l
- Melting point: -107 °C
- Boiling point: 99 °C
- Flash point: -12 °C
- Ignition temp.: 410 °C
- Vapour pressure: (20 °C) 51 hPa
- Viscosity: (22 °C) 0,51 mPas
- Dielectric const.: (20 °C) 1,9
- Evap. heat: (99 °C) 334 KJ/kg
- Saturation conc.: (20 °C) 239 g/m³
- Expl. limit (upper): 6 Vol%
- Expl. limit (lower): 1 Vol%
- pH ~ 7

Toxicological data:
- LD 50 (oral, rat): > 2000 mg/kg
- MAK: 500 ml/m³, 2400 mg/m³
- WGK: 1

Safety:
- EC Index no.: 601-009-00-8
- R: 11-38-50/53-65-67
- S: 9-16-29-33-46-60-61-62
- VbF class: AI
- Poison class CH (Swiss): 5

Transport/storage:
- ADR: 3 F1 II UN 1262
- IMDG: 3 II UN 1262
- IATA/ICAO: 3 II UN 1262
- PAX: 305
- CAO: 307
- LGK: 3 A
- Disposal: 1

IS0156 2,2,4-Trimethylpentane, HPLC grade

Taric code: 2901 10 00 00

assay (G.C.)	min. 99,5 %	min. transmission/max. absorbance in a 1,0 cm cell at		
identity (IR-spectrum)	passes test	wavelength:	T[%]	A (AU)
density (20°/4°)	0,691 - 0,692	205 nm	20 %	0,699 AU
acidity	max. 0,0002 meq/g	209 nm	50 %	0,301 AU
alkalinity	max. 0,0002 meq/g	228 nm	90 %	0,046 AU
non-volatile matter	max. 0,0003 %			
water (K.F.)	max. 0,01 %			

Microfiltered through membranes of pore diameter 0,22 µm

Code	Capacity
IS0156100O	1 l
IS0156250O	2,5 l
IS0156007E	7 l
IS0156025S	25 l

Water

- H_2O
- M = 18,02 g/mol
- CAS [7732-18-5]
- EC number: 231-791-2

Physical data:
- Density: 1,00 g/cm³
- Melting point: 0 °C
- Boiling point: 100 °C
- Vapour pressure: (20 °C) 23 hPa
- Viscosity: (20 °C) 0,95 mPas
- Dipolar moment: (20 °C) 1,85 Debye
- Dielectric const.: (20 °C) 80,2
- Evap. heat: (20 °C) 2253 KJ/kg
- pH (20 °C) 7

Toxicological data:
- WGK: 0

Safety:
- Poison class CH (Swiss): F

Transport/storage:
- LGK: 10-13

NEW AG0006 Water, LC-MS

Taric code: 2851 00 10 00

non-volatile matter	max. 0,0001 %
conductivity (25 °C)	max. 1 µS/cm
chlorides (Cl)	max. 0,000001 %
fluorides (F)	max. 0,000001 %
nitrates (NO_3)	max. 0,00001 %
sulfates (SO_4)	max. 0,00001 %
aluminium (Al)	max. 0,00005 %
barium (Ba)	max. 0,00001 %
cadmium (Cd)	max. 0,000005 %
calcium (Ca)	max. 0,00001 %
chromium (Cr)	max. 0,000002 %
cobalt (Co)	max. 0,000002 %
copper (Cu)	max. 0,000002 %
iron (Fe)	max. 0,00001 %
lead (Pb)	max. 0,00001 %
magnesium (Mg)	max. 0,00001 %
manganese (Mn)	max. 0,000002 %
nickel (Ni)	max. 0,000002 %
potassium (K)	max. 0,00001 %
silver (Ag)	max. 0,00001 %
sodium (Na)	max. 0,00001 %
tin (Sn)	max. 0,00001 %
zinc (Zn)	max. 0,00001 %
suitability for use in LC-MS	passes test
min. transmission/max. absorbance in a 1,0 cm cell at	
wavelength:	T[%] A (AU)
200 nm	95 % 0,022 AU
230 nm	99 % 0,004 AU
gradient grade (210 nm)	
maximum peak absorbance	max. 0,005 AU
gradient grade (254 nm)	
maximum peak absorbance	max. 0,001 AU
microfiltered through membranes of pore diameter 0,22 µm	

Code	Capacity
AG00061000	1 l
AG00062500	2,5 l

AG0001 Water, gradient HPLC grade

Taric code: 2851 00 10 00

non-volatile matter	max. 0,0001 %
conductivity (25 °C)	max. 1 µS/cm
chlorides (Cl)	max. 0,00002 %
nitrates (NO_3)	max. 0,00003 %
sulfates (SO_4)	max. 0,0001 %
lead (Pb)	max. 0,00001 %
microbiologycal assays	passes test
gradient elution: maximum absorption of the largest eluted peaks:	
at 210 nm	0,01 AU
at 254 nm	0,001 AU
microfiltered through membranes of pore diameter 0,22 µm	

Code	Capacity
AG00011000	1 l
AG00012500	2,5 l

Water with 0,1% acetic acid

NEW AG0009 Water with 0,1% acetic acid, LC-MS

Taric code: 3822 00 00 00

acetic acid content (v/v)	0,093 - 0,107 %
pH (20 °C)	3,2 - 3,4
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test
gradient grade (210 nm)	
maximum peak absorbance	max. 0,05 AU
gradient grade (254 nm)	
maximum peak absorbance	max. 0,01 AU
min. transmission/max. absorbance in a 1,0 cm cell at	
wavelength:	T[%] A (AU)
210 nm	20 % 0,699 AU
230 nm	75 % 0,125 AU
254 nm	99 % 0,004 AU
microfiltered through membranes of pore diameter 0,22 µm	

Code	Capacity
AG00091000	1 l

Water with 0,1% ammonium acetate

NEW AG0010 Water with 0,1% ammonium acetate, LC-MS

Taric code: 3822 00 00 00

ammonium acetate content (w/v)	0,093 - 0,107 %
pH (20 °C)	6,2 - 6,4
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test
gradient grade (210 nm)	
maximum peak absorbance	max. 0,01 AU
gradient grade (254 nm)	
maximum peak absorbance	max. 0,01 AU
min. transmission/max. absorbance in a 1,0 cm cell at	
wavelength:	T[%] A (AU)
210 nm	20 % 0,699 AU
230 nm	90 % 0,046 AU
254 nm	99 % 0,004 AU
microfiltered through membranes of pore diameter 0,22 µm	

Code	Capacity
AG00101000	1 l

Water with 0,1% formic acid

NEW **AG0008 Water with 0,1% formic acid**, LC-MS

Tanic code: 3822 00 00 00

Code	Capacity
AG00081000	1 l

formic acid content (w/v)	0,093 - 0,107 %
pH (20 °C)	2,6 - 2,8
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test
gradient grade (210 nm)	
maximum peak absorbance	max. 0,05 AU
gradient grade (254 nm)	
maximum peak absorbance	max. 0,01 AU

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	5 %	1,301 AU
230 nm	45 %	0,347 AU
254 nm	99 %	0,004 AU

microfiltered through membranes of pore diameter 0,22 µm

Water with 0,1% trifluoroacetic acid

NEW **AG0007 Water with 0,1% trifluoroacetic acid**, LC-MS

Tanic code: 3822 00 00 00

Code	Capacity
AG00071000	1 l

trifluoroacetic acid content (w/v)	0,093 - 0,107 %
pH (20 °C)	1,8 - 2,0
calcium (Ca)	max. 0,00005 %
magnesium (Mg)	max. 0,00005 %
potassium (K)	max. 0,00005 %
sodium (Na)	max. 0,0002 %
suitability for use in LC-MS	passes test
gradient grade (210 nm)	
maximum peak absorbance	max. 0,05 AU
gradient grade (254 nm)	
maximum peak absorbance	max. 0,01 AU

min. transmission/max. absorbance in a 1,0 cm cell at

wavelength:	T(%)	A (AU)
210 nm	25 %	0,602 AU
230 nm	85 %	0,071 AU
254 nm	99 %	0,004 AU

microfiltered through membranes of pore diameter 0,22 µm

Solvent features

Several chemical and physical properties should be taken in account when selecting the solvent(s) to be used as mobile phase in HPLC. Polarity, miscibility, elution strength and, UV cutoff are some of these parameters. We have compiled the values of the most common solvents for your convenience. See tables below.

Solvent	Refractive index	UV cutoff	Viscosity (cP) at 20°C	Hildebrand solubility parameter	Elution strenght (E0) SiO_2	Elution strenght (E0) Al_2O_3	Polarity index according to Sneider	BP (°C)
Acetic acid	1.372	210	1.1-1.26	12.4		Large	6.2	117.9
Acetone	1.359	330	0.32	9.6	0.47-0.53	0.56-0.58	5.4	56.3
Acetonitrile	1.344	190	0.37	11.7	0.5	0.55-0.65	6.2	81.6
Benzene	1.501	280	0.65	9.2	0.25	0.32	3.0	80.1
Benzyl alcohol			5.8				5.5	205.5
1-Butanol							3.9	117.2
2-Butanol	1.395							
t-Butanol	1.385							
2-Butanone	1.377							
Butyl acetate	1.392							
t-Butyl methyl ether	1.370	210	0.27		0.35		2.9	55.2
Carbon tetrachloride	1.466	265	0.97	8.6	0.12	0.18	1.7	76.5
Chloroform	1.443	245	0.57	9.2	0.26	0.36-0.4	3.4-4.4	61.2
Cyclohexane	1.427	200	0.98	8.2	0.04	0.04	0.0	80.7
Cyclohexanone			2.24				4.5	155.7
Dichloroethane							3.7	83.4
Dichloromethane	1.424	232	0.44	9.6	0.32	0.4	3.4	40
Di-isopropylamine	1.390							
N,N-Dimethyl formamide	1.431	268	0.90-0.92	11.5		6.4	153	
Dimethyl sulfoxide	1.478		2.24	12.8	0.41	0.62	6.5	189
1,4-Dioxane							4.8	101
Ethanol	1.361	205-210	1.2	12	0.68	0.88	5.2	78.3
Ethyl acetate	1.370	256	0.46-0.47	9.1	0.38-0.48	0.58	4.3	77.1
Ethyl ether	1.352							
Ethylene dichloride	1.445	230	0.79	9.7	0.38	0.49	3.7	83.5
Formamide	1.450	210	3.3-3.76				7.3	210.5
n-Hexane	1.375	195	0.313	7.3	0.03	0.01	0.0	68.9
Isopropyl ether	1.368	220	0.33-0.37	7.3	0.22	0.28	2.2	68.3
Methanol	1.329	205	0.6	13.7	0.73	0.95	6.6	64.7
Methyl ethyl ketone	1.379	330	0.43	9.3	0.39	0.51	4.5	80
1-Propanol			2.3				4.3	97.2
2-Propanol	1.38	210	2.35			0.82	4.3	82.4
Pyridine	1.510	305-330	0.94	10.7		0.71	5.3	115.3
Tetrahydrofuran	1.408	212-230	0.55	9.1	0.35	0.45	4.2	66
Toluene	1.496	285	0.59	8.9	0.23	0.29	2.3	101.6
Triethylamine	1.401		0.38				1.8	89.5
Trifluoroacetic acid	1.283							
2,2,4-Trimethylpentane	1.404	197-210	0.5	7	0.01	0.01	0.4	99.2
Water	1.333	180	1	21		Large	9.0	100
p-Xylene			0.7				2.4	138

Solvents sorted by elution strenght (Eo) Al_2O_3

Solvent	Refractive index	UV cutoff	Viscosity (cP) at 20°C	Hildebrand solubility parameter	Elution strenght (E0) SiO_2	Elution strenght (E0) Al_2O_3	Polarity index according to Sneider	BP (°C)
2,2,4-Trimethylpentane	1.404	197-210	0.5	7	0.01	0.01	0.4	99.2
n-Hexane	1.375	195	0.313	7.3	0.03	0.01	0.0	68.9
Cyclohexane	1.427	200	0.98	8.2	0.04	0.04	0.0	80.7
Carbon tetrachloride	1.466	265	0.97	8.6	0.12	0.18	1.7	76.5
Isopropyl ether	1.368	220	0.33-0.37	7.3	0.22	0.28	2.2	68.3
Toluene	1.496	285	0.59	8.9	0.23	0.29	2.3	101.6
Benzene	1.501	280	0.65	9.2	0.25	0.32	3.0	80.1
Chloroform	1.443	245	0.57	9.2	0.26	0.36-0.4	3.4-4.4	61.2
Dichloromethane	1.424	232	0.44	9.6	0.32	0.4	3.4	40
Tetrahydrofuran	1.408	212-230	0.55	9.1	0.35	0.45	4.2	66
Ethylene dichloride	1.445	230	0.79	9.7	0.38	0.49	3.7	83.5
Methyl ethyl ketone	1.379	330	0.43	9.3	0.39	0.51	4.5	80
Acetonitrile	1.344	190	0.37	11.7	0.5	0.55-0.65	6.2	81.6
Acetone	1.359	330	0.32	9.6	0.47-0.53	0.56-0.58	5.4	56.3
Ethyl acetate	1.370	256	0.46-0.47	9.1	0.38-0.48	0.58	4.3	77.1
Dimethyl sulfoxide	1.478		2.24	12.8	0.41	0.62	6.5	189
Pyridine	1.510	305-330	0.94	10.7		0.71	5.3	115.3
2-Propanol	1.38	210	2.35			0.82	4.3	82.4
Ethanol	1.361	205-210	1.2	12	0.68	0.88	5.2	78.3
Methanol	1.329	205	0.6	13.7	0.73	0.95	6.6	64.7
Acetic acid	1.372	210	1.1-1.26	12.4		Large	6.2	117.9
Water	1.333	180	1	21		Large	9.0	100

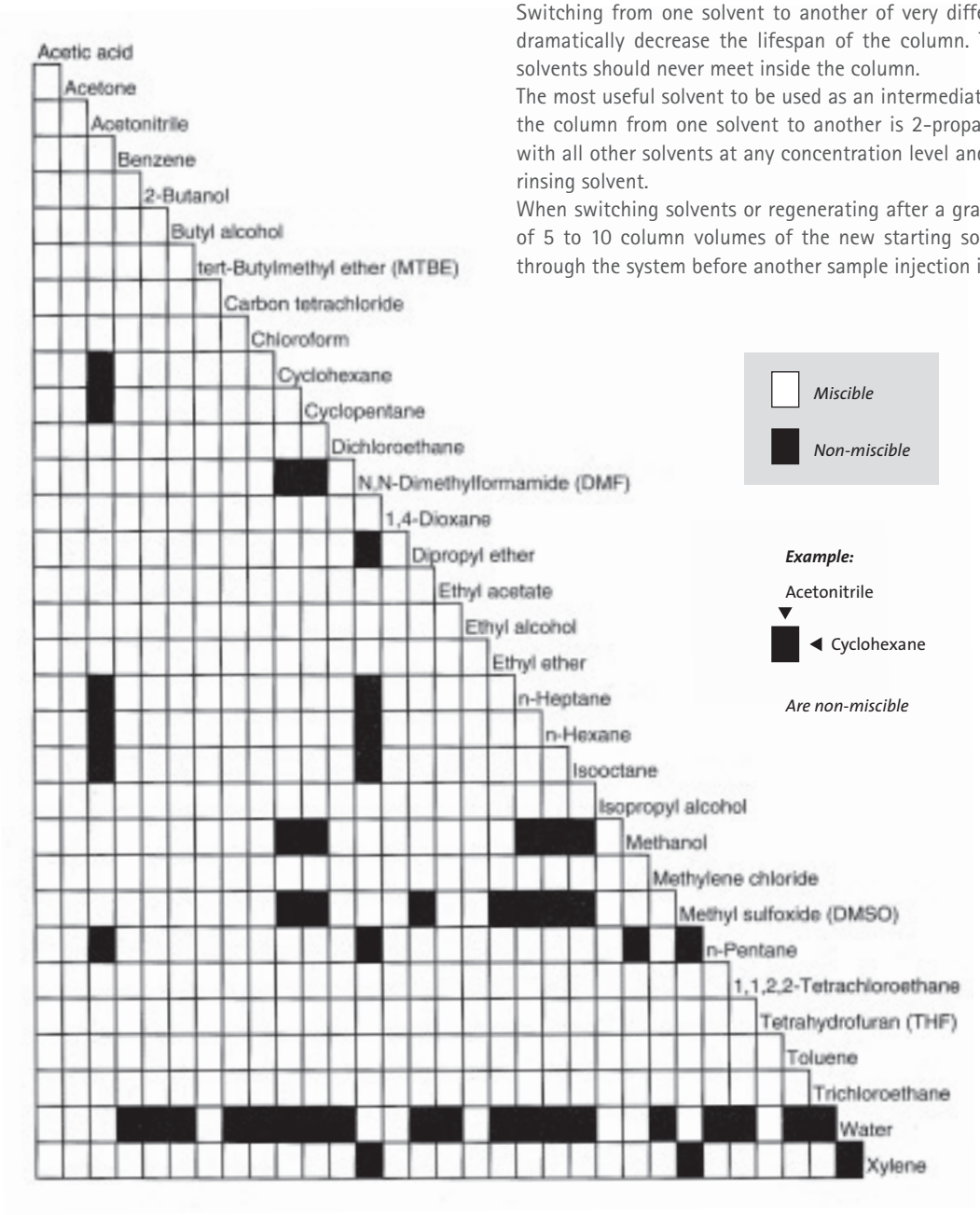
Solvent features

Miscibility chart

Switching from one solvent to another of very different polarity can dramatically decrease the lifespan of the column. Two non-miscible solvents should never meet inside the column.

The most useful solvent to be used as an intermediate when switching the column from one solvent to another is 2-propanol. It is miscible with all other solvents at any concentration level and is also used as a rinsing solvent.

When switching solvents or regenerating after a gradient, a minimum of 5 to 10 column volumes of the new starting solvent should flow through the system before another sample injection is made.



Selection of starting solvent

The starting solvent or blend selected for a given separation can be chosen by matching the relative polarity of the solvent to that of the sample. Once the run is performed:

1. If the sample appears at the solvent front then the solvent is too polar to allow the adsorbent to retard the sample. Use a solvent of lower polarity.

2. If the sample does not appear within a reasonable timeframe, use a solvent of higher polarity.

Glossary of chromatography terms

For a better understanding of formulas related to the terms below, see the figures at the end of the glossary.

Adsorption chromatography
Relies on the adsorption process to effect separation. Also called liquid-solid chromatography. Molecules are reversibly bonded to the stationary phase as the result of dipole-dipole interactions. Liquid-solid adsorption chromatography was widely used to separate polar, non-ionic organic compounds until the introduction of partition chromatography.

Affinity chromatography
Relies on selective binding of the analyte to specific ligands coupled to a solid support or carrier. The molecules that bind to the ligand are retained, and then released in a second step in a purified state.

Analyte
Compound of interest that is determined by means of an analytical method.

Band
Mobile phase zone that contains one analyte, inside the column.

Band broadening
Effect of spreading experienced by the chromatographic band as it moves through the column. There are three causes of band broadening (eddy diffusion, longitudinal diffusion and slow mass transfer).

Baseline
Constant detector signal due to the background level of the instrument.

Bonded phase
Stationary phase chemically bonded to a support (traditionally silica). Alkyl, amino, nitrile or phenyl groups are common bonded phases.

Capacity factor (k')
Measure of the position of a sample peak in the chromatogram. Specific for a given substance and condition.

$k'=(t_R-t_o)/t_o$

Column
Tube with a polished inner surface and end fittings at both ends where the stationary phase is packed. The chromatographic separation occurs inside the column. Usually made of stainless steel.

Dead time (t_o)
Time required by an inert compound to migrate from the injection point to the column end with no interaction with the stationary phase.

Detection limit
Refers to the amount of sample that produces a signal that is twice the noise level.

Detector
Instrument connected to the end of the column that continuously monitors some physical property of the column effluent.

Eddy diffusion
Undesired migration of the analytes inside the packed column due to the lack of packing homogeneity, which produces peak broadening (also see Van Deemter equation).

Efficiency
Measure of the column quality. Efficiency is quantitatively expressed as the number of theoretical plates: a higher number of theoretical plates indicates a more efficient column.

Eluent
Mobile phase.

Endcapping
Procedure applied mainly to reverse phase packings to cover the maximum number of free silanol sites by adding a small silylating agent. Done to eliminate undesirable polar interactions between basic analytes and silanol sites.

End fitting
Fitting at the end of the column that connects it to the injector or detector. Contains the frit, a small sieve that prevents packing material from coming out of the column.

External standard
Analytical method used to quantify an unknown sample by comparison to different concentration solutions of a standard. The standard is the same compound as the unknown.

Flow rate
Quantitatively describes the movement of fluid along a flow path, most often expressed in ml/min (milliliters per minute) for typical liquid chromatography applications.

Frit
Small sieve contained by both column end fittings to prevent both small particles in the mobile phase from coming into the column and the packing material from coming out from the column. Frits are made of stainless steel or polymeric materials such as PEEK.

Fronting
Non-Gaussian peak shape where the front part tapers in advance of the rest of the peak. Fronting is the opposite of TAILING. A fronting peak has a peak symmetry value < 1.

Gaussian curve
Symmetrical bell-shaped curve. Assumed to be "perfect" in most chromatography theory.

Gel filtration chromatography (GFC)
Size exclusion chromatography carried out with aqueous mobile phases. Used for the separation of water soluble polymers, most of them biopolymers.

Gel permeation chromatography (GPC)
Size exclusion chromatography carried out with organic mobile phases. Used for the separation and characterisation of organic soluble polymers.

Ghost peak
Unexpected peak due to contamination on any part of the chromatographic system (injector, column, detector cell, etc.).

Gradient elution
HPLC technique where the mobile phase composition changes during the separation. This technique enables difficult separations that cannot be done by isocratic elution. The most common gradients are binary and involve water and an organic solvent such as methanol or acetonitrile.

Guard column
Short column placed immediately before the analytical column and after the injector. The guard column is packed with the same material as the column and retains particles and other contaminants that could damage the analytical column. It is cheaper than the analytical column and discarded when it becomes contaminated.

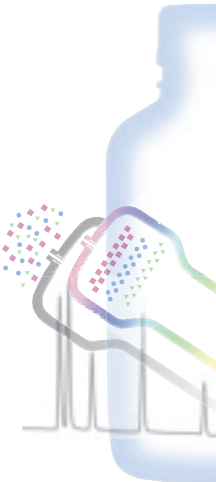
Height equivalent of a theoretical plate (h) (HETP)
Length where chromatographic equilibrium between mobile and stationary phase is reached; taken as an indication of column quality.

$h=L/n$

where L is the column length and n, the number of theoretical plates.

Injector valve
Part of the chromatographic system that allows the sample to be introduced in the mobile phase stream without noticeable flow interruption. Can be a manual valve or an automated device for multiple unattended injections.

Internal standard
Compound added to both the standard solutions and also to the unknown to help in quantitative analysis. Internal standard (S) is first mixed to a known analyte solution (A) and the ratio of signals is calculated $(A/S)_{known}$. Internal standard (S) is then added to the unknown and the ratio of signals also calculated $(A/S)_{unknown}$. Since the signal ratios are proportional to the concentration ratios, the concentration ratio of [A]/[S] in the unknown is simply the concentration ratio of [A]/[S] in the known solution multiplied by $(A/S)_{unknown}$ and divided by $(A/S)_{known}$. Internal standards are desirable



Glossary of chromatography terms

to avoid mistakes produced by loss of sample.

Ion chromatography

Chromatography where the stationary phases are low capacity ion-exchangers and the mobile phase is a weak buffer. Used to determine low concentrations of anions and cations. Conductivity detectors are commonly used. Sometimes an ion suppression device is added to the system in order to remove buffer ions and improve the detection of sample ions.

Ion-exchange chromatography

Chromatography method in which the separation mechanism is ionic interaction between the compounds and the stationary phase. Charged species are exchanged with ions in the ionogenic groups of stationary phase. Retention is based in the affinity of different ions to the site as well as solution parameters (pH, ionic strength, etc.).
Basic functional groups bonded to the phase form anion exchangers. The tetralkylammonium group is a typical strong anion-exchange functional group. An amino group bonded on the rigid adsorbent surface would be the example of a weak anion exchanger.
Acidic groups bonded to the phase form cation exchangers. A sulfonic acid would be an example of a strong cation-exchange group; a carboxylic acid would be a weak cation-exchange group.

Ion-pair chromatography

Relies on the addition of ion pair reagents to the mobile phase in order to avoid non-desirable polar interactions in reverse phase chromatography of polar molecules. Ion pair reagents are large ionic molecules having a hydrophobic part able to interact with the long chain alkyl groups of the stationary phase, as well as a charge opposite to the analyte of interest. When the ion pair reagent is added to the mobile phase, it combines with the analyte counter-ion and a neutral specie is formed. Then, an optimum reverse phase separation is achieved.

Isocratic elution

HPLC technique where the mobile phase composition does not change during the separation.

Linear velocity (u)

Mobile phase speed through the chromatographic system. Related to the flow rate by the cross-sectional area of the column. Typically reported in cm/min. This parameter is used to adapt chromatographic methods to different column diameters. In this case, flow rate must be changed to keep the linear velocity the same.

Mass transfer

Movement of analytes between the mobile phase and the stationary phase to reach an equilibrium. The faster the mass transfer, the better the efficiency of the column. Low mass transfer is one of the causes of band broadening. This is expressed in the Van Deemter equation.

Mean pore diameter

Average pore diameter in porous packings; must be large enough to allow the molecules of analyte to enter and to interact with the stationary phase. Typical pore diameters for silica are between 60 and 125 Å. When analysing peptides or other big molecules, 300 Å is needed.

Microbore

Term applied to HPLC applications or columns used in HPLC where the column inner diameter is less than or equal to 2 mm.

Mobile phase

Liquid phase continuously flowing through the column and carrying the analytes. It can be constituted by one or more components. If the composition of the mobile phase changes during the analysis, a gradient is performed.

Noise

Random fluctuation of the chromatographic signal.

Normal-phase chromatography

Chromatography mode where the mobile phase is a non-polar liquid and the stationary phase is a polar substance. Typical stationary phases are silica, NH_2 or CN. The mobile phase commonly used is hexane.

Number of theoretical plates (n)

Measure of the efficiency of the column. The larger the number of theoretical plates of a column, the more complicated sample mixtures can be separated by the column.

$n=16(t_R/w)^2$ or $n=5{,}54\ (t_R/w_{1/2})^2$

Overload

Negative effect produced when an excess of sample amount is injected in a column. Reduced efficiency and resolution are the results of overloading.

Partition chromatography

Liquid-liquid chromatography. The analytes are distributed between two liquid phases. The stationary phase is chemically bonded to a support and the mobile phase flows freely down the column.
In normal phase partition chromatography, the mobile phase is less polar than the stationary phase.
In reverse phase (RP) chromatography, the mobile phase is more polar than the stationary phase.

Packing material

Generally refers to the stationary phase, but more specifically to the solid support where it is linked (silica, gel, etc.).

Partition coefficient (K)

Refers to the relative presence of analyte in the two phases in liquid-liquid chromatography. Usually expressed as the ratio of concentrations present in both phases.

Peak symmetry

Ratio of the distance between the peak apex and the peak end to the distance between the peak apex to the peak front; measured at 10% of the peak height. A value > 1 is a tailing peak while a value < 1 is a fronting peak.

Relative retention (α)

Also known as separation factor. Ratio between the capacity factors of two substances, where the figure in the denominator is the reference compound.

$\alpha = k'_2/k'_1$

Residual silanols

Free silanol sites remaining in the silica after it is bonded with stationary phase functional groups (long-chained alkylsilanes). Residual silanols are often endcapped to eliminate undesirable interactions with analytes.

Resolution (Rs)

Refers to the measure of the separation of two adjacent peaks.

$Rs = 2(t_{R2}-t_{R1})/(w_b+w_a)$

Retention time (t_R) (total)

Time needed for the sample to migrate from the injection point to the maximum response.

Retention time (t'_R) (net)

Difference between total retention time and dead time

Retention volume

Mobile phase volume required to elute the analyte. Calculated by multiplying the retention time by the flow rate.

Reversed-phase chromatography

Liquid chromatography mode where the stationary phase is a non-polar compound (usually octadecyl or octylsilanes) and the mobile phases are polar liquids (usually water, methanol or acetonitrile). Most common HPLC mode.

Sample capacity

Amount of sample that can be injected into a column without overloading it. Usually expressed in grams of sample per gram of packing material.

Selectivity (α)

Relative retention of two analytes measured in one given stationary phase. The higher the selectivity, the better the separation. Also called separation factor.

$\alpha = (t_{R2}-t_{Ro})/(t_{R1}-t_{Ro})$

Sensitivity

Ability of the detector to provide higher signal per amount of sample introduced.

Glossary of chromatography terms

Silica gel
Porous amorphous granulated material commonly used in liquid chromatography. Used both as a direct stationary phase and as a support to chemically bond any other stationary phase (polar or non-polar). Typical particle sizes of silica for analytical HPLC are 3, 5 or 10 µm.

Stationary phase
One of the two phases that participate in the separation mechanism of chromatography. Packed inside the column.

Tailing
Non-Gaussian peak shape where the end part of the peak is elongated as a tail. Tailing is the opposite of FRONTING. Caused by stronger than normal retention of analytes in the stationary phase. A tailing peak has a peak symmetry value > 1.

Van Deemter equation
Mathematical function that expresses the band broadening phenomenon as a sum of three factors: eddy diffusion, longitudinal diffusion and mass transfer. The equation is:

H = A + B/u + Cu

where H is the plate height, u is the linear velocity of the mobile phase, A is the eddy diffusion term, B is the longitudinal diffusion coefficient, and C is the coefficient of the mass transfer term. The lower the value of H, the more efficient the column.

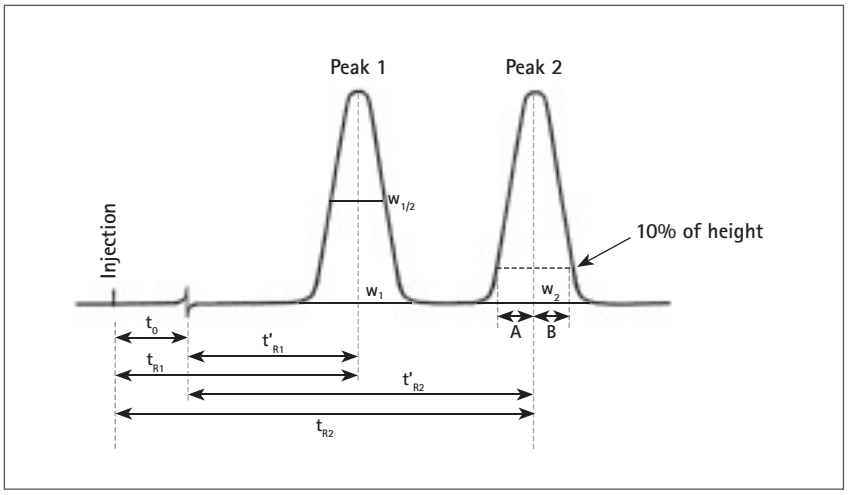
The eddy diffusion term, A, represents the multitude of pathways by which a component finds its way through the column. In a poorly packed column, the retention time for molecules of the same component can vary significantly depending on the numerous flow paths that could be taken. This effect results in band broadening.

The longitudinal diffusion term, B/u, describes a band broadening process that is inversely related to the mobile phase velocity. The analyte is in the column for a shorter time when the flow rate is high; hence the diffusion term is less.

The mass transfer term, Cu, describes the time available for equilibrium of an analyte to be established between the mobile and stationary phases. At high mobile flow rates there is less time for this equilibrium to take place and a contribution to the broadening effect is observed.

Void (in a column)
Refers to the empty space appearing in the column head because of packing settling or dissolution. Leads to efficiency and resolution loss. Sometimes, the void can be refilled with either packing or glass wool and the performance of the column is recovered.

Void volume (Vo)
Total volume from injector to detector flow cell that can be occupied by the mobile phase.



t_0 = Dead time
t_R = Retention time
t'_R = Net Retention time
w = Peak width
$w_{1/2}$ = Peak width at half height

Capacity factor:

$k'_1=(t_{R_1}-t_o)/t_o$

Number of theoretical plates (efficiency):

$n=16\ (t_{R_1}/w_1)^2$

or

$n= 5{,}54\ (t_{R_1}/w_{1/2})^2$

Selectivity:

$\alpha = (t_{R_2}-T_{RO})/(t_{R_1}-t_{RO})$

or

$\alpha = \frac{k'_2}{k'_1}$

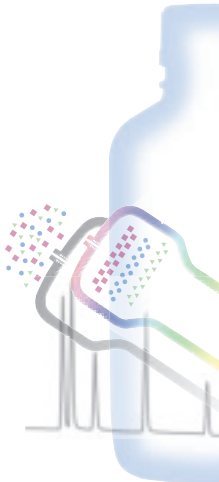
Symetry = B/A

Resolution:

$R_s = 2(t_{R_2}-t_{R_1})/(w_2+w_1)$

Heigh equivalent of a theoretical plate:

$h = L/n$



Absorbance/Transmittance

Absorbance value is more useful in spectrophotometry than transmittance, because of the fact that plot of absorbance vs concentration yields a straight line. A plot of transmittance vs concentration is an exponential curve.

Transmittance/Absorbance $A = -\log_{10} T$

%T	A (AU)	%T	A (AU)	%T	A (AU)	%T	A (AU)
1	2,000	26	0,585	51	0,292	76	0,119
2	1,699	27	0,569	52	0,284	77	0,114
3	1,523	28	0,553	53	0,276	78	0,108
4	1,398	29	0,538	54	0,268	79	0,102
5	1,301	30	0,523	55	0,260	80	0,097
6	1,222	31	0,509	56	0,252	81	0,092
7	1,155	32	0,495	57	0,244	82	0,086
8	1,097	33	0,481	58	0,237	83	0,081
9	1,046	34	0,469	59	0,229	84	0,076
10	1,000	35	0,456	60	0,222	85	0,071
11	0,959	36	0,444	61	0,215	86	0,066
12	0,921	37	0,432	62	0,208	87	0,060
13	0,886	38	0,420	63	0,201	88	0,056
14	0,854	39	0,409	64	0,194	89	0,051
15	0,824	40	0,398	65	0,187	90	0,046
16	0,796	41	0,387	66	0,180	91	0,041
17	0,770	42	0,377	67	0,174	92	0,036
18	0,745	43	0,367	68	0,167	93	0,032
19	0,721	44	0,357	69	0,161	94	0,027
20	0,699	45	0,347	70	0,155	95	0,022
21	0,678	46	0,337	71	0,149	96	0,018
22	0,658	47	0,328	72	0,143	97	0,013
23	0,638	48	0,319	73	0,137	98	0,009
24	0,620	49	0,310	74	0,131	99	0,004
25	0,602	50	0,301	75	0,125	100	0,000

Flow rate

Resolution and efficiency of two columns of different diameter is the same if the linear velocity of the mobile phase through the column is also the same. Since linear velocity is related to the flow rate by the cross-sectional area of the column it is easy to calculate the new flow rate F_2.

$$F_2 = F_1(ID_2)^2/(ID_1)^2$$

Where

ID = Internal diameter
F = Flow rate

In the table below, every raw contains flow rates (ml/min) giving the same linear velocity for different column diameters:

I.D. = 3 mm	I.D. = 4 mm	I.D. = 4,6 mm	I.D. = 8 mm	I.D. = 10 mm	I.D. = 20 mm
1	1,78	2,35	7,11	11,11	44,44
1,78	1	1,32	4	6,25	25
0,42	0,76	1	3,02	4,73	18,9
0,14	0,25	0,33	1	1,56	6,25
0,09	0,16	0,21	0,64	1	4
0,02	0,04	0,05	0,16	0,25	1

Pressure units

	psi	atm	kg/cm²	kPa	Bar	mm Hg
psi	1	$6,8\ 10^{-2}$	$7,03\ 10^{-2}$	6,8948	$6,895\ 10^{-2}$	51,715
atm	14,696	1	1,0332	101,32	1,0133	760
kg/cm²	14,223	0,9678	1	98,06	0,9806	735,5
kPa	0,145	$9,87\ 10^{-3}$	$1,02\ 10^{-2}$	1	10^{-2}	7,501
Bar	14,5038	0,9869	1,0197	100	1	750,1
mm Hg	$1,93\ 10^{-2}$	$1,31\ 10^{-3}$	$1,36\ 10^{-3}$	0,1333	$1,333\ 10^{-3}$	1

R: Risk phrases

1	Explosive when dry.
2	Risk of explosion by shock, friction, fire or other sources of ignition.
3	Extreme risk of explosion by shock, friction, fire or other sources of ignition.
4	Forms very sensitive explosive metallic compounds.
5	Heating may cause an explosion.
6	Explosive with or without contact with air.
7	May cause fire.
8	Contact with combustible material may cause fire.
9	Explosive when mixed with combustible material.
10	Flammable.
11	Highly flammable.
12	Extremely flammable.
13	Extremely flammable liquefied gas.
14	Reacts violently with water.
15	Contact with water liberates extremely flammable gases.
16	Explosive when mixed with oxidising substances.
17	Spontaneously flammable in air.
18	In use, may form flammable/explosive vapour-air mixture.
19	May form explosive peroxides.
20	Harmful by inhalation.
21	Harmful in contact with skin.
22	Harmful if swallowed.
23	Toxic by inhalation.
24	Toxic in contact with skin.
25	Toxic if swallowed.
26	Very toxic by inhalation.
27	Very toxic in contact with skin.
28	Very toxic if swallowed.
29	Contact with water liberates toxic gas.
30	Can become highly flammable in use.
31	Contact with acids liberates toxic gas.
32	Contact with acids liberates very toxic gas.
33	Danger of cumulative effects.
34	Causes burns.
35	Causes severe burns.
36	Irritating to eyes.
37	Irritating to respiratory system.
38	Irritating to skin.
39	Danger of very serious irreversible effects
40	Limited evidence of a carcinogenic effect.
41	Risk of serious damage to eyes.
42	May cause sensitisation by inhalation.
43	May cause sensitisation by skin contact.
44	Risk of explosion if heated under confinement.
45	May cause cancer.
46	May cause heritable genetic damage.
47	May cause birth defects.
48	Danger of serious damage to health by prolonged exposure.
49	May cause cancer by inhalation.
50	Very toxic to aquatic organisms.
51	Toxic to aquatic organisms.
52	Harmful to aquatic organisms.
53	May cause long-term adverse effects in the aquatic environment.
54	Toxic to flora.
55	Toxic to fauna.
56	Toxic to soil organisms.
57	Toxic to bees.
58	May cause long-term adverse eflects in the environment.
59	Dangerous for the ozone layer.
60	May impair fertility.
61	May cause harm to the unborn child.
62	Possible risk of impaired fertility.
63	Possible risks of harm to the unborn child.
64	May cause harm to breastfed babies
65	Harmful: may cause lung damage if swallowed.
67	Vapours may cause drowsiness and dizziness.
66	Repeated esposure may cause skin dryness or cracking.
68	Possible risk of irreversible effects.

Combination ofparticulars risks

14/15	Reacts violently with water, liberating extremely flammable gases.
15/29	Contact with water liberates toxic, extremely flammable gas.
20/21	Harmful by inhalation and in contact with skin.
20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
20/22	Harmful by inhalation and if swallowed.
21/22	Harmful in contact with skin and if swallowed.
23/24	Toxic by inhalation and in contact with skin.
23/24/25	Toxic by inhalation, in contact with skin and if swallowed.
23/25	Toxic by inhalation and if swallowed.
24/25	Toxic in contact with skin and if swallowed.
26/27	Very toxic by inhalation and in contact with skin.
26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
26/28	Very toxic by inhalation and if swallowed.
27/28	Very toxic in contact with skin and if swallowed
36/37	Irritating to eyes and respiratory system.
36/37/38	Irritating to eyes, respiratory system and skin.
36/38	Irritating to eyes and skin
37/38	Irritating to respiratory system and skin
39/23	Toxic: danger of very serious irreversible effects through inhalation.
39/23/24	Toxic: danger of very serious irreversible effects through inhalation and in contact with skin.
39/23/24/25	Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
39/23/25	Toxic danger of very serious irreversible effects through inhalation and if swallowed.
39/24	Toxic: danger of very serious irreversible effects in contact with skin.
39/24/25	Toxic: danger of very serious irreversible effects in contact with skin and if swallowed.
39/25	Toxic: danger of very serious irreversible effects if swallowed.
39/26	Very toxic: danger of very serious irreversible effects through inhalation.
39/26/27	Very toxic: danger of very serious irreversible effects through inhalation and in contact with skin.
39/26/27/28	Very toxic: danger ol very serious irreversible effects through inhalation, in contact with skin and if swallowed.
39/26/28	Very toxic: danger of very serious irreversible effects through inhalation and if swallowed.
39/27	Very toxic: danger of very serious irreversible effects in contact with skin.
39/27/28	Very toxic: danger of very serious irreversible effects in contact with skin and if swallowed.
39/28	Very toxic: danger of very serious irreversible effects if swallowed.
40/20	Harmful: possible risk of irreversible effects through inhalation.
40/20/21	Harmful: possible risk of irreversible effects through inhalation and in contact with skin.
40/20/21/22	Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
40/20/22	Harmful: possible risk of irreversible effects through inhalation and if swallowed.
40/21	Harmful: possible risk of irreversible effects in contact with skin.
40/21/22	Harmful: possible risk of irreversible effects in contact with skin and if swallowed.
40/22	Harmful possible risk of irreversible effects if swallowed.
42/43	May cause sensitisation by inhalation and skin contact.

R and S phrases

48/20	Harmful: danger of serious damage to health by prolonged exposure.
48/20/21	Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
48/20/21/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
48/20/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
48/21	Harmful: danger of serious damage to health by prolonged exposure in contact with skin.
48/21/22	Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.
48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.
48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
48/23/24	Toxic: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
48/23/24/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
48/23/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
48/24	Toxic: danger of serious damage to health by prolonged exposure in contact with skin.
48/24/25	Toxic: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.
48/25	Toxic: danger of serious damage to health by prolonged exposure if swallowed.
50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
52/53	Harmful to acquatic organisms, may cause long-term adverse effects in the acquatic environment.
51/53	Toxic to acquatic organisms, may cause long-term effects in the aquatic environment.
68/20	Harmful: possible risk of irreversible effects through inhalation.
68/21	Harmful: possible risk of irreversible effects in contact with skin.
68/22	Harmful: possible risk of irreversible effects if swallowed.
68/20/21	Harmful: possible risk of irreversible effects through inhalation and in contact with skin.
68/20/22	Harmful: possible risk of irreversible effects through inhalation and if swallowed.
68/21/22	Harmful: possible risk of irreversible effects in contact with skin and if swallowed.
68/20/21/22	Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.

S: Safety phrases

1	Keep locked up.
2	Keep out of reach of children.
3	Keep in a cool place.
4	Keep away from living quarters.
5	Keep contents under _ (appropriate liquid to be specified by the manufacturer)
5.3	Keep contents under paraffin oil.
6	Keep under (inert gas to be specified by the manufacturer)
7	Keep container tightly closed.
8	Keep container dry.
9	Keep container in a well ventilated place.
12	Do not keep the container sealed.
13	Keep away from food, drink and animal feeding stuffs.
14	Keep away from _ (incompatible materials to be indicated by the manufacturer)
14.1	Keep away from alkalis.
14.2	Keep away from oxidizing and acidic substances as well as heavy metal compounds.
14.9	Keep away from flammable organic substances.
15	Keep away from heat.
16	Keep away from sources of ignition - No Smoking.
17	Keep away from combustible material.
18	Handle and open container with care.
20	When using do not eat or drink.
21	When using do not smoke.
22	Do not breathe dust.
23	Do not breathe gas/fumes/vapour/sray (appropiate wording to be specified by the manufacturer).
23.2	Do not breathe vapour.
24	Avoid contact with skin.
25	Avoid contact with eyes.
26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
27	Take off immediately all contaminated clothing.
28	After contact with skin, wash immediately with plenty of _ (to be specified by the manufacturer).
28.1	After contact with skin, wash immediately with plenty of water.
28.2	After contact with skin, wash immediately with soap and water.
28.3	After contact with skin, wash immediately with soap and water, if possible also with polyethylene glycol 400.
28.6	After contact with skin, wash immediately with polyethylene glycol 400 (then rinse with plenty of water).
29	Do not empty into drains.
30	Never add water to this product.
33	Take precautionary measures against static discharges.
34	Avoid shock and friction.
35	This material and its container must be disposed of in a safe way.
36	Wear suitable protective clothing.
37	Wear suitable gloves.
38	In case of insufficient ventilation, wear suitable respiratory equipment.
39	Wear eye/face protection.
40	To clean the floor and all objects contaminated by this material use _ (to be specified by the manufacturer).
41	In case of fire and/or explosion do not breathe fumes.
42	During fumigation/spraying wear suitable respiratory equipment (appropriate wording to be specified)
43	In case of fire, use _ (indicate in the space the precise type of fire-lighting equipment. If water increases the risk add - Never use water)
43.1	In case of fire, use water.
43.3	In case of fire, use powder extinguisher. Never use water.
43.6	In case of fire, use sand. Never use water.
43.7	In case of fire, use metal-fire powder. Never use water.
43.8	In case of fire, use sand, carbon dioxide or powder extinguisher. Never use water.
44	If you feel unwell, seek medical advice (show the label where possible)
45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
46	If swallowed seek medical advice immediately and show this container or label
47	Keep at temperature not exceeding _ °C (to be specified by the manufacturer)
48	Keep wetted with _ (appropriate material to be specified by the manufacturer)
49	Keep only in the original container.
50	Do not mix with _ (to be specified by the manufacturer)
50.1	Do not mix with acids.
51	Use only in well ventilated areas.
52	Not recommended for interior use on large surface areas.
53	Avoid exposure - obtain special instruction before use.
54	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants.

R and S phrases

55	Treat using the best available techniques before discharge into drains or the aquatic environment.
56	Dispose of this material and its containes at hazardous or special waste collection point.
57	Use appropriate containment to avoid environmental contamination.
58	To be disposed of as hazardous waste.
59	Refer to manufacturer/supplier for information on recovery/recycling
60	This material and its container must be disposed of as hazardous waste.
61	Avoid release to the environment.Refer to special instructions/Safety data sheets.
62	If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.
63	In case of accident by inhalation: remove casualty to fresh air and keep at rest.
64	If swallowed, rinse mouth with water (only if the person is conscious).

Combination of safety precautions

1/2	Keep locked up and out of reach of children.
3/7	Keep container tightly closed in a cool place.
3/7/9	Keep container tightly closed, in a cool well ventilated place.
3/9	Keep in a cool well ventilated place
3/9/14	Keep in a cool, well ventilated place away from _ (incompatible materials to be indicated by the manufacturer)
3/9/14.1	Keep in a cool, well ventilated place away from alkalis.
3/9/14/49	Keep only in the original container in a cool, well-ventilated place away from ... (incompatible materials to be indicated by the manufacturer).
3/9/49	Keep only in the original container in a cool, well-ventilated place.
3/14	Keep in a cool place away from ... (incompatible materials to be indicated by the manufacturer).
7/8	Keep container tightly closed and dry.
7/9	Keep container tightly closed and in a well-ventilated place.
20/21	When using do not eat, drink or smoke.
24/25	Avoid contact with skin and eyes.
27/28	After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of ... (to be specified by the manufacturer).
29/35	Do not empty into drains; dispose of this material and its container in a safe way.
36/37	Wear suitable protective clothing and gloves.
36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
36/39	Wear suitable protective clothing and eye/face protection.
37/39	Wear suitable gloves and eye/face protection.
47/49	Keep only in the original container at temperature not exceeding _ °C (to be specified by the manufacturer).