Chromatography

HPLC solvents

GC solvents

Ion Pair Reagents

Auxiliary Reagents

DASITGROUP | CARLO ERBA REAGENTS

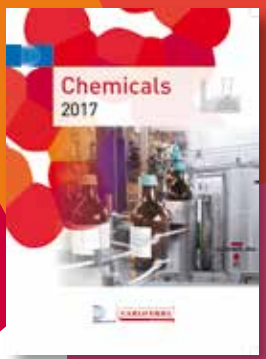
INTERNATIONAL

CARLO ERBA Reagents S.A.S
Chaussée du Vexin
27106 Val de Reuil

To contact customer service :
export@cer.dgroup.it
Ph. : +33 2 32 09 20 00
Fax : +33 2 32 09 20 20

- CARLO ERBA Reagents, an international recognized supplier of chemicals since 150 years, is specialised in high quality products, meeting your highest requirements : alcohols, solvents, minerals, buffers, acids in different grades, all included in a range of around 6000 references.
- Our two production facilities in France offer quality and service thanks to the flexibility and diversity of our production tools.
- An international logistics platform and 4 distribution centers with high stock levels ensure a level of service that meets your requirements.

CARLO ERBA Reagents
Your partner in choice



- Our quality department, independent of our production, manages documentation, records control, traceability, internal audits, change control, periodic monitoring of indicators, and continuous improvement
- Certifié ISO 9001 : 2015
- ANSM inspection certificate for our 2 production sites
- Global offer : 2 catalogues for a better service.... Chemicals et Labware
- An Out-sourcing service complements our offer to meet your research exotic chemicals
- A customer service with dedicated customer advisors, special requests management, online services such as e-commerce, [...]

CARLO ERBA Reagents, a recognized chemical supplier for more than 150 years, operates at an international level in Analytical and Industrial Chemistry in the laboratory and industry sectors.

With its two production units, the CARLO ERBA Reagents Group offers its customers quality and service through the flexibility of production and installations Mixers up to 7000l, distillation columns, storage tanks, automated packaging lines, clean rooms are some of the technologies engineered to meet the vast range of the market needs.

Standard operational procedures for highly qualified operators for better plant management, permanent controls of all phases of production and packaging are the criteria that guide CARLO ERBA Reagents in its industrial activity.

In this brochure dedicated to chromatography, find in the first part a selection of chemicals (solvents, reagents, standards) specifically developed by CARLO ERBA Reagents for different types of chromatography.

- **Liquid chromatography**
  - Solvents for UHPLC-MS
  - Solvents, additives and blends for LC-MS
  - Solvents for HPLC Gradient
  - Solvents for HPLC Isocratic
  - Solvents for HPLC preparative
  - Mobile phases
  - Silica gel and filter aids
- **Gas chromatography**
  - HEADSPACE solvents
  - ATRASOL® solvents for the detection of traces in organic compounds and hydrocarbons
  - ATRASOL® solvents for Hydrocarbon index determination according to EN ISO 9377-2
  - GC-MS Solvents
  - PESTIPUR® Solvents for pesticides residue analysis
  - Organic standards
- **Ion Pair chromatography**
- **Ionic chromatography**
  - Concentrated mobile phases
  - Standard solutions

LIQUID CHROMATOGRAPHY

LEADER in the market for solvents for chromatography and trace analysis, CARLO ERBA Reagents extended its range of solvents for HPLC in order to satisfy the ever increasing requirements in terms of equipment and detection methods.A particular emphasis was placed on impurities which, by interaction, can affect the result's reliability.

Our solvents for HPLC meet the requirements for this analytical technique by guaranteeing the optimal specifications on the following elements :

- Purity
- Non volatile residue content
- UV Transmission

ANALYSIS METHOD

CARLO ERBA Reagents GRADES	HPLC Preparative	HPLC Isocratic mode	HPLC Gradient mode	LC-MS	UHPLC	UHPLC-MS
RS HPLC Preparative	■					
RS HPLC Isocratic	■	■				
RS HPLC PLUS Gradient		■	■			
RS HPLC GOLD Ultra Gradient		■	■			
RS HPLC-MS			■	■		
RS UHPLC-MS			■	■	■	■

IN this easy-to-consult document, we offer you a choice of products specifically adapted for the preparation and analysis of your HPLC samples :

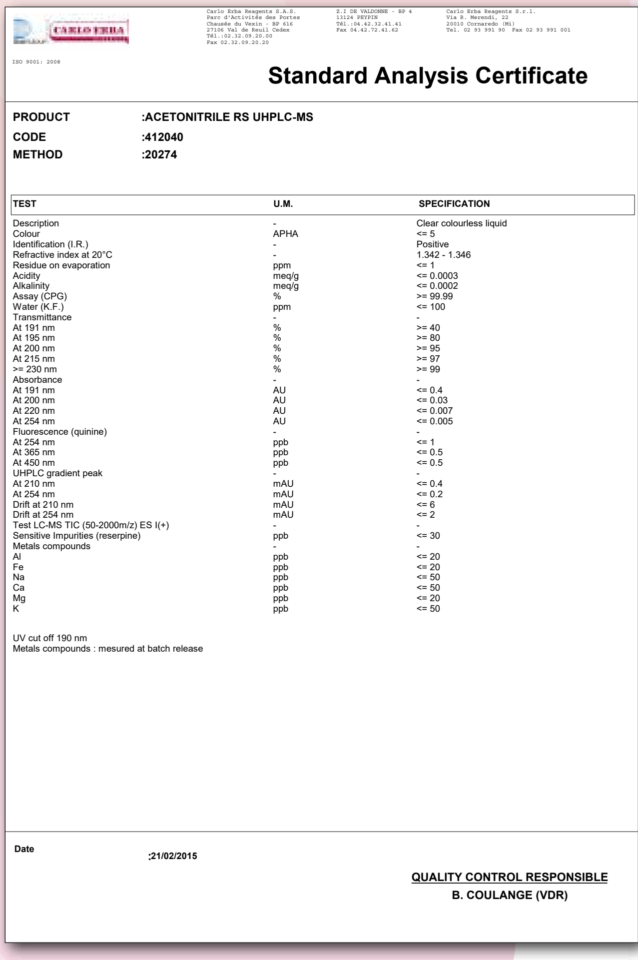
- Solvents for UHPLC-MS
- Solvents, additives and blends for LC-MS
- Solvents for HPLC gradient
- Solvents for HPLC isocratic
- Solvents for HPLC preparative
- Mobile phases
- Silica gel and filter aids

SOLVENTS FOR UHPLC-MS

The UHPLC-MS is certainly the chromatographic technique for users who, besides being on the lookout for the best analytical performances, work at very high pressure, with minimum solvent consumption and need a guarantee of resolution and reproducibility of results.

In order to always be in line with the needs of its market and to provide the best service to our customers in term of quality and breadth of its range, CARLO ERBA Reagents has developed a specific range of solvents dedicated to solvents for UHPLC-MS in order to meet the quality requirements of this refined analytical technique.

- Purity higher than **99.95** %
- High UV transmission
- Excellent baseline quality in gradient **tested specifically for UHPLC**
- Reserpine test (< 30 ppb) => specific test for MS application
- Low content in inorganic and metallic ions
- Non volatile residue less than 1 ppm
- Filtration at least 0.2µm or 0.1µm
- Packaged in 1.1-difluoroethane treated amber glass to reduce significantly the potential formation of metals adducts



Carlo Erba Reagents S.A.S.
Parc d'Activités des Portes
Chaussée du Vexin - BP 616
27106 Val de Reuil Cedex
Tél.:02.32.09.20.00
Fax 02.32.09.20.20

Z.I DE VALDONNE - BP 4
13124 PEYPIN
Tél.:04.42.32.41.41
Fax 04.42.72.41.62

Carlo Erba Reagents S.r.l.
Via R. Merendi, 22
20010 Cornaredo (Mi)
Tel. 02 93 991 90 Fax 02 93 991 001

ISO 9001: 2008

Standard Analysis Certificate

PRODUCT :ACETONITRILE RS UHPLC-MS
CODE :412040
METHOD :20274

TEST	U.M.	SPECIFICATION
Description	-	Clear colourless liquid
Colour	APHA	<= 5
Identification (I.R.)	-	Positive
Refractive index at 20°C	-	1.342 - 1.346
Residue on evaporation	ppm	<= 1
Acidity	meq/g	<= 0.0003
Alkalinity	meq/g	<= 0.0002
Assay (CPG)	%	>= 99.99
Water (K.F.)	ppm	<= 100
Transmittance	-	-
At 191 nm	%	>= 40
At 195 nm	%	>= 80
At 200 nm	%	>= 95
At 215 nm	%	>= 97
>= 230 nm	%	>= 99
Absorbance	-	-
At 191 nm	AU	<= 0.4
At 200 nm	AU	<= 0.03
At 220 nm	AU	<= 0.007
At 254 nm	AU	<= 0.005
Fluorescence (quinine)	-	-
At 254 nm	ppb	<= 1
At 365 nm	ppb	<= 0.5
At 450 nm	ppb	<= 0.5
UHPLC gradient peak	-	-
At 210 nm	mAU	<= 0.4
At 254 nm	mAU	<= 0.2
Drift at 210 nm	mAU	<= 6
Drift at 254 nm	mAU	<= 2
Test LC-MS TIC (50-2000m/z) ES I(+)	-	-
Sensitive Impurities (reserpine)	ppb	<= 30
Metals compounds	-	-
Al	ppb	<= 20
Fe	ppb	<= 20
Na	ppb	<= 50
Ca	ppb	<= 50
Mg	ppb	<= 20
K	ppb	<= 50

UV cut off 190 nm
Metals compounds : mesured at batch release

Date :21/02/2015

QUALITY CONTROL RESPONSIBLE
B. COULANGE (VDR)

Product	Quality	UHPLC Gradient	Drift UHPLC	Pkg	Code
Acetonitrile	UHPLC-MS	At 210 nm <= 0.4 mAU	At 210 nm <= 6 mAU	1 L	412041
		At 254 nm <= 0.2 mAU	At 254 nm <= 2 mAU	2,5 L	412042
Methanol	UHPLC-MS	At 220 nm <= 4 mAU	At 220 nm <= 30 mAU	1 L	414941
		At 235 nm <= 2 mAU	At 235 nm <= 10 mAU	2,5 L	414942
		At 254 nm <= 1 mAU			
Water	UHPLC-MS	At 210 nm <= 2 mAU	At 210 nm <= 3 mAU	1 L	412091
		At 254 nm <= 0.5 mAU	At 254 nm <= 30 mAU	2,5 L	412092

SOLVENTS, ADDITIVES AND BLENDS FOR LC-MS

For your LC-MS routine analysis, CARLO ERBA Reagents offers a complete range of products with the most common solvents, additives and solutions ready-to-use among the most used mobile phases that bring you :

- Time saving
- Precise composition
- The assurance of an LC-MS quality
- Traceability
- Repeatability

Produced from LC-MS quality solvents and specifically tested for LC-MS coupling, these solutions guarantee :

- Test in gradient mode
- High UV transmission
- Solvent purity > 99.95 %
- Precise additive content
- Low content in inorganic and metallic ions
- Packaged in 1.1-difluoroethane treated amber glass to reduce significantly the potential formation of metals adducts

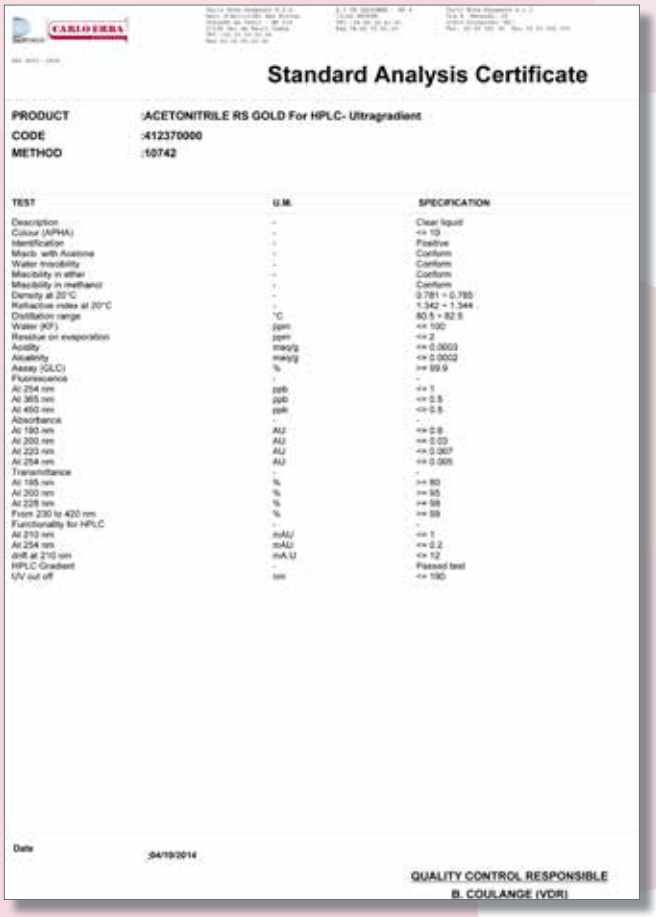
	Product	Quality	Pkg	Code
Solvents	Acetonitrile	LC/MS	1 L	412341
			2,5 L	412342
	Ethyl acetate	LC/MS	1 L	448383
			2,5 L	448384
	Methanol	LC/MS	1 L	414831
			2,5 L	414832
	Propanol-2	LC/MS	1 L	415183
			2,5L	415184
	Water	LC/MS	1 L	412111
			2,5 L	412112
Additives	Acetic acid	LC/MS	10 x 1 ml	401411
			10 x 2,5 ml	401412
			50 ml	401413
			1 L	401414
	Ammonium acetate	LC/MS	50 g	418781
	Ammonium formate	LC/MS	50 g	419741
	Formic acid	LC/MS	10 x 1 ml	405821
			10 x 2,5 ml	405822
			50 ml	405823
	Trifluoroacetic acid	LC/MS	10 x 1 ml	411541
			10 x 2,5 ml	411542
			50 ml	411543
Blends	Acetonitrile + 0.1% v/v formic acid	LC/MS	1 L	412331
			2,5 L	412332
	Acetonitrile + 0.1% v/v trifluoroacetic acid	LC/MS	1 L	412321
			2,5 L	412322
	Methanol + 0.1% v/v formic acid	LC/MS	1 L	414861
			2,5 L	414862
	Méthanol + 0.1% v/v trifluoroacetic acid	LC/MS	1 L	414871
			2,5 L	414872
	Water+ 0.1% v/v formic acid	LC/MS	1 L	412121
			2,5 L	412122

SOLVENTS FOR HPLC GRADIENT

CARLO ERBA Reagents proposes 2 ranges : HPLC GOLD Ultragradient and HPLC PLUS Gradient for your analysis in Gradient mode.

The gradient control of elution and drift at critical wavelengths of our HPLC solvents Gold and Plus guarantee a peak free baseline. Their optimal sensitivity allows you to evaluate in the best possible way the impurities of your samples.

To make sure that no particle in the mobile phase will hinder your analyses, we carry out a microfiltration of our GOLD solvents at 0.1 µm and for HPLC Gradient Plus at 0.2 µm.


Standard Analysis Certificate

PRODUCT :ACETONITRILE RS GOLD For HPLC- Ultragradient
CODE :412370000
METHOD :10742

TEST	U.M.	SPECIFICATION
Description	-	Clear liquid
Colour (APHA)	-	<= 10
Identification	-	Positive
Miscib. with Acetone	-	Conform
Water miscibility	-	Conform
Miscibility in ether	-	Conform
Miscibility in methanol	-	Conform
Density at 20°C	-	0.781 ÷ 0.785
Refractive index at 20°C	-	1.342 ÷ 1.344
Distillation range	°C	80.5 ÷ 82.5
Water (KF)	ppm	<= 100
Residue on evaporation	ppm	<= 2
Acidity	meq/g	<= 0.0003
Alkalinity	meq/g	<= 0.0002
Assay (GLC)	%	>= 99.9
Fluorescence	-	-
At 254 nm	ppb	<= 1
At 365 nm	ppb	<= 0.5
At 450 nm	ppb	<= 0.5
Absorbance	-	-
At 190 nm	AU	<= 0.6
At 200 nm	AU	<= 0.03
At 220 nm	AU	<= 0.007
At 254 nm	AU	<= 0.005
Transmittance	-	-
At 195 nm	%	>= 80
At 200 nm	%	>= 95
At 228 nm	%	>= 98
From 230 to 420 nm	%	>= 99
Functionality for HPLC	-	-
At 210 nm	mAU	<= 1
At 254 nm	mAU	<= 0.2
drift at 210 nm	mA.U	<= 12
HPLC Gradient	-	Passed test
UV cut off	nm	<= 190

Date :04/10/2014

QUALITY CONTROL RESPONSIBLE
B. COULANGE (VDR)

Product	Quality	Pkg	Code
Acetonitrile	HPLC Gold Ultragradient	1 L	412371000
		2,5 L	412372000
		4 L	412374
		5 L	412375
	HPLC Plus Gradient	1 L	412391000
	ACS-Reag.Ph.Eur.-Reag.USP	1 L*	412393
		2,5 L	412392000
Ethanol	HPLC Plus Gradient	1 L	4127012
		1 L*	4127032
		2,5 L	4127022
Methanol	HPLC - Gold Ultragradient	1 L	412721
		2,5 L	412722
		4 L	412724
		5 L	412725
	HPLC Plus Gradient	1 L	412381
		2.5 L	412383
Propanol-2	HPLC Plus Gradient	1 L	412711000
		2,5 L	412712000
Water	HPLC Plus Gradient	1 L	412141
		2,5 L	412142

* *Glass bottle PVC coated*

SPECIFICATIONS

		Acetonitrile			Methanol		
		UHPLC MS 412040	LC MS 412340	GOLD UltraGradient 412370000	UHPLC MS 414940	LC MS 414830	GOLD UltraGradient 412720
Purity (GC)	%	min 99.99	min 99.95	min 99.9	min 99.99	min 99.95	min 99.9
Water content	%	max 0.01	max 0.01	max 0.01	max 0.02	max 0.02	max 0.02
Non volatil residue	ppm	max 1	max 2	max 2	max 1	max 2	max 5
Acidity	meq/g	max 0.0003	max 0.0005	max 0.0008	max 0.0003	max 0.0003	max 0.0003
Titrable base	meq/g	max 0.0002	max 0.0002	max 0.0002	max 0.00006	max 0.00006	max 0.0006
Absorbance							
at 190 nm	A.U.			max 1			
at 191 nm	A.U.	max 0.4					
at 200 nm	A.U.	max 0.03		max 0.05			
at 220 nm	A.U.	max 0.01		max 0.05			
at 254 nm	A.U.	max 0.005		max 0.001			
UV Transmission (1cm - Ref : water)							
at 191 nm	%	min 40					
at 195 nm	%	min 80	min 80	min 79			
at 197 nm	%						
at 200 nm	%	min 95	min 95	min 90			
at 210 nm	%			min 95	min 40	min 30	min 30
at 215 nm	%	min 97					
at 220 nm	%		min 98	min 98			min 55
at 225 nm	%				min 70	min 65	min 65
from 230 nm	%	min 99	min 99				
from 240 nm				min 98			
at 235 nm	%					min 85	min 85
at 240 nm	%						min 90
at 250 nm	%					min 95	min 95
from 260 nm	%				min 98	min 98	min 98
Fluorescence (quinine) at 254 nm	ppb	max 1	max 1	max 1	max 1	max 1	max 1
Fluorescence(quinine) at 365 nm	ppb	max 0.5	max 0.5	max 0.5	max 1	max 1	max 1
Fluorescence (quinine) at 450 nm	ppb	max 0.5		max 0.5			
UHPLC gradient							
at 210 nm	mAU	max 0.4					
at 220 nm	mAU				max 4		
at 235 nm	mAU				max 2		
at 254 nm	mAU	max 0.2					
HPLC gradient							
at 210 nm	mAU		max 1	max 2			
at 235 nm	mAU					max 2	max 2
at 254 nm	mAU		max 0.2	max 0.8		max 1	max 1
Drift at 210 nm	mAU	max 6		max 12			
Drift at 220 nm	mAU				max 30		
Drift at 235 nm	mAU				max 10		
Drift at 254 nm	mAU	max 2					
LC/MS test TIC (50-2000 m/z) ESI (+)							
Sensitive impurities (in reserpine)	ppb	max 30	max 50		max 30	max 50	
Metal content (1) :							
Aluminium	ppb	max 20	max 50		max 20	max 50	
Iron	ppb	max 20	max 50		max 20	max 50	
Sodium	ppb	max 50	max 50		max 50	max 50	
Calcium	ppb	max 50	max 50		max 50	max 50	
Magnesium	ppb	max 20	max 50		max 20	max 50	
Potassium	ppb	max 50	max 50		max 50	max 50	

(1) Concentrations measured at batch release

SOLVENTS FOR HPLC ISOCRATIC

Available in glass bottles (1L and 2.5L) or stainless steel shuttle drums (5 to 1000L), their characteristics satisfy the requirements of the most advanced HPLC techniques in terms of purity and optical transmission.

Product	Pkg	Code
Acetic acid	1 L	401431
	2,5 L	401432
Acetone	1 L	412501
	2,5 L	412502
Acetonitrile	1 L	412411000
	2,5 L	412412000
Butanol	1 L	412511000
	2,5 L	412512000
1-Chlorobutane	1 L	431821
Chloroform stabilized with amylene	1 L	412571
	2,5 L	412572
Chloroform stabilized with ethanol	1 L	412652
	2,5 L	412653
Cyclohexane	1 L	412431000
	2,5 L	412432000
sym-Dichloroethane	1L	447191
	2,5 L	447192
Dichloromethane stabilized with amylene	1 L	412621000
	2,5 L	412622000
Dichloromethane stabilized with ethanol	1 L	412662
	2,5 L	412661
Dimethylformamide	1 L	444981
	2,5 L	444982
Dimethylsulfoxyde	1 L	445141
	2,5 L	445142
1,4 - Dioxane	1L	443231
Ethanol absolute anhydrous	1 L	4125212
	2,5 L	4125222
Ethanol 96	1 L	4145412
	2,5 L	4145422
Ethyl ether not stabilized	1 L	412671
	2,5 L	412672
Ethyle acetate	1 L	412611000
	2,5 L	412612000
n-Heptane 99%	1 L	412591000
	2,5 L	412592000
n-Heptane	1 L	446831
	2,5 L	446832

Product	Pkg	Code
Hexane 99 %	1 L	412691
	2,5 L	412692
n-Hexane	1 L	412601000
	2,5 L	412602000
Hexane Mixture of isomers	1 L	412632
	2,5L	412631
Isohexane	1 L	445152
	2,5 L	445151
Isooctane	1 L	412441000
	2,5 L	412442000
Methanol	1 L	412533
	1 L*	412531
	2,5 L	412532
	2,5 L*	412535
2-Methyltetrahydrofuran	1 L	412681
	2,5 L	412682
n-Pentane	1 L	P0643716
	2,5 L	P0643721
Propanol-1	1 L	412541000
	2,5 L	412542000
Propanol-2	1 L	412421000
	2,5 L	412422000
Ter-butylmethylether	1 L	432031
	2,5 L	432032
Tetrahydrofuran not stabilized	1 L	412451000
	1L *.	412453000
	2,5 L	412452000
Tetrahydrofuran stabilized	1 L	412471
	2,5 L	412472
Toluene	1 L	412641000
	2,5 L	412642000
Triethylamin	1 L	489631
	2,5 L	489633

* *Glass bottle PVC coated*

SOLVENTS FOR HPLC PREPARATIVE

Our range of solvents for HPLC preparative have been designed to satisfy the requirements for separations and purifications. Their low non volatile residue content (5 ppm maximum) allows to optimize the operation conditions and to make impurity-free preparations.

All of these solvents are available in 2.5 L bottles and in stainless steel shuttle drums from 5 to 1 000 L.

Product	Code 2.5 L
Acetonitrile	412409
Chloroform stabilized with ethanol	438641
Dichloromethane stabilized with amylene	463281
Dichlorométhane stabilized with ethanol	463291
Ethyle acetate	448211
Propanol-2	415112
Tetrahydrofuran	487352
Ter-butylmethylether	432022000
Toluene	488531

TAILOR MADE SERVICE

All of our solvents for HPLC Preparative, Isocratic, Gradient, Ultragradient, LC-MS and eluant phases are also available in stainless steel shuttle drums from 5, 10, 25, 200 litres with sampling systems adapted to your needs.

SILICA GEL AND FILTER AIDS

BESIDES the widely used silica gel, other products with particular characteristics are also available and offer a series of valid alternatives for resolving numerous separation problems.
CARLO ERBA Reagents proposes a wide range of silica gel among the general used types.

Product	Pkg	Code
Aluminum oxide (acid)	250 g	417185
	1 kg	417182
Aluminum oxide (basic)	100 g	417214
	1 kg	417217
Aluminum oxide (neutral)	250 g	417245
	1 kg	417241
	2.5 kg	417248
Aluminum oxide activated	1 kg	312261
Calcium carbonate	250 g	433245
Cellulose, powder	250 g	436061
Charcoal activated	250 g	434455
	1 kg	434454
Dicalite 4158	500 g	P8880014
	1 kg	P8880017
	5 kg	P8880027
Florisil 100-200 mesh	100 g	452351
	500 g	452353
Florisil 60-100 mesh for chromatography	100 g	452331
	500 g	452333
	1 kg	452332
Florisil 60-100 mesh for pesticides analysis	100 g	452271
	500 g	452273
Kieselguhr composed	250 g	449895
	250 g	449897
Magnesium oxide	1 kg	459617
Sand purified	1 kg	477153

Product	Pkg	Code
Silica gel 60A 6 - 35µ	1 kg	P2010017
	5 kg	P2010027
	25 kg	P2010044
Silica gel 60A 20 - 45µ	1 kg	P2200017
	5 kg	P2200027
Silica gel 60A 35 - 70µ	1 kg	P2000017
	2 kg	P2000026
	5 kg	P2000027
	25 kg	P2000044
Silica gel 60A 40 - 63µ	1 kg	P2050017
	5 kg	P2050027
	25 kg	P2050044
Silica gel 60A 70 - 200µ	1 kg	P2100017
	2 kg	P2100026
	5 kg	P2100027
	25 kg	P2100044
Silica gel 60A 0,06÷0,20 mm	500 g	453336
	1 kg	453337
	5 kg	453332
	20 kg	453331

MOBILE PHASES

If you regularly use an eluent phase, we can prepare it for you according to your specifications.
Your mobile phase is prepared from HPLC quality solvents according to procedures (respect of the GMPs) and with validated equipment in compliance with the pharmacopeia.

The ready-to-use eluent phase provides you with :

- Important time saving for preparation
- Reduction of risks linked to the handling of toxic or hazardous products
- Guaranteed pH
- Possibility of large sized homogeneous batches
- Labelling conforming to legislation and to BPLs

It is supplied with :

- Certificate of analysis of the batch
- Safety data sheet

Examples

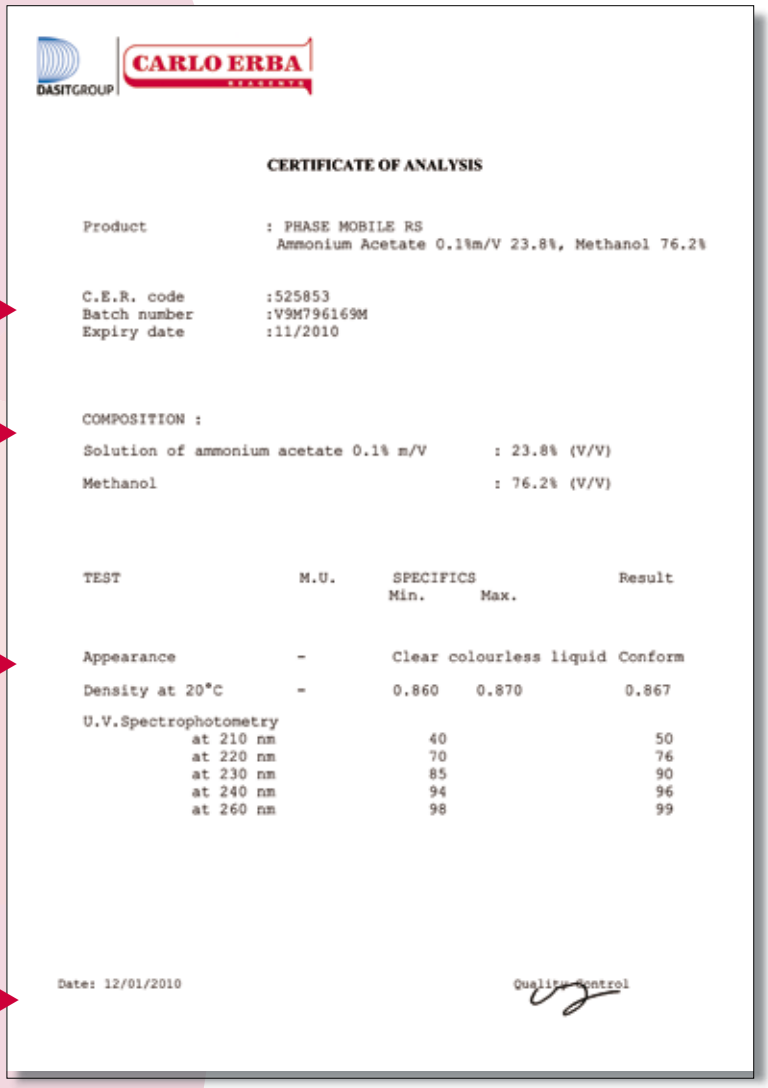
Acetonitrile + methanol + buffered pH 5

Acetonitrile + water

Ethyl acetate + toluene

Water + TFA

Water + THF



DASITGROUP CARLO ERBA

CERTIFICATE OF ANALYSIS

Product : PHASE MOBILE RS
Ammonium Acetate 0.1%m/V 23.8%, Methanol 76.2%

C.E.R. code :525853
Batch number :V9M796169M
Expiry date :11/2010

COMPOSITION :
Solution of ammonium acetate 0.1% m/V : 23.8% (V/V)
Methanol : 76.2% (V/V)

TEST	M.U.	SPECIFICS Min.	Max.	Result
Appearance	-	Clear colourless liquid		Conform
Density at 20°C	-	0.860	0.870	0.867
U.V.Spectrophotometry				
at 210 nm		40		50
at 220 nm		70		76
at 230 nm		85		90
at 240 nm		94		96
at 260 nm		98		99

Date: 12/01/2010

Quality Control

Batch number
Expiry date

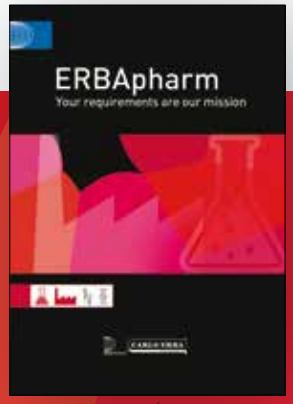
Composition

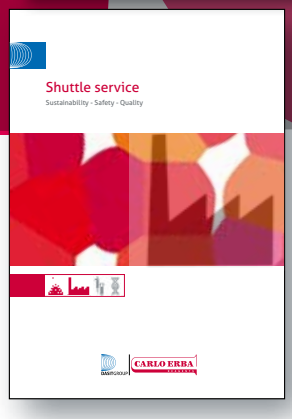
Specifications defined by customer

Date

Expertise, Flexibility and Versatility at your Service

- ERBApharm® : Dedicated range for Pharma Business
- Change control
- Traceability
- Customized packaging
- Tailored solutions
- Shuttle Service





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Your **partner in choice** for Chemicals

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GAS CHROMATOGRAPHY

Broad spectrum chemical analysis of trace level components is a continuing challenge for any analytical chemist. This challenge is further confounded when chemical impurities may be present in common organic solvents or when chemical artifacts may be formed, produced and introduced during an analytical procedure. Minimizing and understanding these chemical artifacts is critical for trace level detection and is crucial for accurate analytical conclusions.

CARLO ERBA Reagents GC Solvents are the right choice for your complex mixture challenges.

ANALYSIS METHOD

CARLO ERBA Reagents GRADES	GC-FID For analysis of organic substances and trace of hydrocarbons	GC-ECD For analysis of pesticides and chlorinated substances	GC-NPD For analysis of pesticides, nitrogenous and phosphorus substances	GC-Headspace For residual solvents anakysis in pharmaceutical industry	GC-MS For high sensitivity analysis
RS - ATRASOL®	■	■			
RS - PESTIPUR®		■	■		
RS - HEADSPACE				■	
RS - GC-MS					■

In this brochure, we offer you a choice of products specifically adapted for the preparation and analysis of your samples by GC :

- Solvents for HEADPSACE
- ATRASOL® Solvents for the detection of traces in organic compounds and hydrocarbons
- ATRASOL® Solvents for Hydrocarbon index determination according to EN ISO 9377-2
- Solvents for GC-MS
- PESTIPUR® Solvents for pesticides residue analysis
- Organic standards

HEADSPACE SOLVENTS

The International Conference on Harmonization (ICH) adopted a document named "impurities": this is an explicative note related to residual solvents, which prescribes the maximum amount of solvent in active substances, excipients, and medications after their synthesis. The methods used for their identification are described in the chapters 467 of USP and 2.4.24 of the European pharmacopeia.

Three classes of solvents are defined:
- Class 1 : Solvents to be avoided
- Class 2 : Solvents to be limited
- Class 3 : Solvents with low toxic potential

The technique used to determine these Organic Volatile Impurities (OVI) is GC-Headspace which requires the use of organic solvents to dissolve and/or extract the sample. These solvents need to be free of impurities that could interfere with the GC trace.

CARLO ERBA Reagents offers a **specific product line** dedicated to the GC-Headspace technique. Utilizing our solvents developed and tested specifically for GC-headspace ensure the highest quality and batch to batch consistency for your tests.

Product	Pkg	Code
n,n-Dimethylacetamide	1 L	444311
n,n-Dimethylformamide	1 L	444991
Dimethylsulphoxide	1 L	445121
n-Methylpyrrolidone-2	1 L	462881
Water	1 L	412011

REFERENCE STANDARDS FOR ANALYSIS OF RESIDUAL SOLVENTS

CARLO ERBA Reagents developed a range of solvent mixtures class 1 and 2, with concentration within the allowable limits established in chapter 467 of the USP and 2.4.24 of the European Pharmacopeia. These mix allow you to determine the amount of residual solvents in your raw material that can be used for API synthesis.

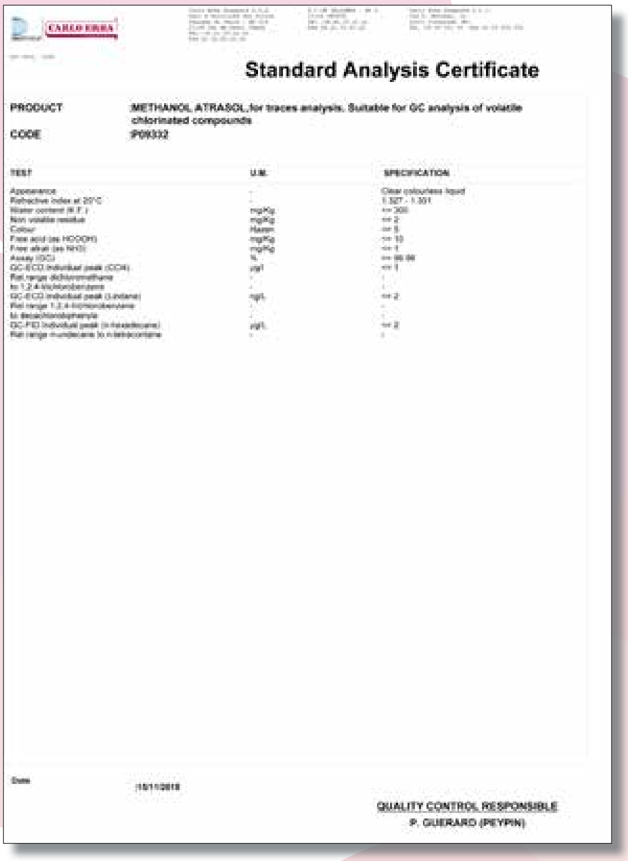
All the standards come with certificate of analysis insuring total traceability :
- Batch number and expiration date
- CAS number of each component
- Molecular formula of each component
- Batch number of each bulk material used
- Concentration of each component
- Expanded uncertainties

Solvents type	Pkg		Code
Mix (Recommended by European Pharmacopeia / ICH class 1) : 5 elements	Sealed ampule	1 mL	507688
Mix (Recommended by USP < 467 > class 1) : 5 elements	Sealed ampule	1 mL	507692
Mix 1 (Recommended by European Pharmacopeia / ICH class 2) : 14 elements	Sealed ampule	1 mL	507689
Mix 2 (Recommended by European Pharmacopeia / ICH class 2) : 11 elements	Sealed ampule	1 mL	507690
Mix 3 (Recommended by European Pharmacopeia / ICH class 2) : 6 elements	Sealed ampule	1 mL	507691
Mix 1 (Recommended by USP < 467 > class 2) : 16 elements	Sealed ampule	1 mL	507693
Mix 2 (Recommended by USP < 467 > class 2) : 6 elements	Sealed ampule	1 mL	507694

ATRASOL® SOLVENTS FOR THE DETECTION OF TRACES IN ORGANIC COMPOUNDS AND HYDROCARBONS

Rigorous gas chromatographic controls and extreme operation accuracy in both production and packaging make these the best-suited solvents in gas chromatography for all determinations of traces of organics requiring extreme precision and sensitivity.

High purity, guaranteed absence of extraneous peaks in gas chromatographic determinations and guarantee of reproducibility and repeatability of the results are the main feature of this product line.
For the entire **ATRASOL®** line, the absence of critical impurities is ensured by means of precise functionality tests in **GC-ECD** and **GC-FID.**



Product	Pkg	Code
Acetone	1 L	P0053216
	2,5 L	P0053221
	4 L	P0053282
Chloroform stabilized with ethanol	1 L	P02432E16
	2,5 L	P02432E21
Dichloromethane stabilized with amylene	1 L	P02932A16
	2,5L	P02932A21
	4 L	P02932A82
Dichloromethane stabilized with ethanol	1 L	P02932E16
	2,5 L	P02932E21
n,n-Dimethylformamide	1 L	P0343216
	2,5 L	P0343221
Dimethylsulphoxide	1 L	P0353216
	2,5 L	P0353221
Ethyl acetate	1 L	P0023216
	2,5 L	P0023221
n-Hexane 99%	1 L	P052323016
	2,5 L	P052323021
Methanol	1 L	P0933216
	2,5 L	P0933221
n-Pentane 99%	1 L	P064323016
	2,5 L	P064323021
Toluene	1 L	P0713216
	2,5 L	P0713221
	4 L	P0713282

ATRASOL® SOLVENTS FOR HYDROCARBON INDEX DETERMINATION ACCORDING TO EN ISO 9377-2

The European regulation **EN ISO 9377-2** "Determination of hydrocarbon oil index - Method using solvent extraction and gas chromatography", established the criteria for the evaluation of the hydrocarbon index in water using gas chromatography. This procedure is suitable for surface water, wastewater and water from sewage treatment plants.

Isohexane, hexane and petroluem ether ATRASOL®, with their boiling range between 36 and 69 ° C, are ideal for this application. Each batch is specifically analyzed so that the hydrocarbon index is less than or equal to 0.1 mg/l, in the retention time window between n-decane and n-tetracontane.


Certificate of Analysis

Product	Pkg	Code
n-Hexane	1 L	P0523216
	2,5 L	P0523221
Isohexane	1 L	P6263216
	2,5 L	P6263221
n-Pentane	1 L	P0643216
	2,5L	P0643221
Petroleum ether 35 - 60°C	1 L	P0883216
	2,5 L	P0883221

REFERENCE STANDARDS

For the determination of mineral oils, the regulation prescribes specific mixtures of standard solutions. CARLO ERBA Reagents has a complete range of standard mixtures, each with a certificate of analysis with complete information on the composition and gravimetric validation carried out in reference to NIST standards.

Product	Pkg	Code
Standard quality control of 2 mineral oils in acetone 0.5mg/ml each	1 mL	506002
Mixture of 2 mineral oils without additive 5 mg / ml each in hexane	1 mL	506010
	5 mL	506012
	10 mL	506013
Mixture of 2 mineral oil without additive 1 mg/ml each in hexane	10 mL	506011
Standard mixture of n-alkanes (C10 to C40 in pairs) of 50 µg/ml each in hexane	1 mL	506020
	10 mL	506021
Mother solution of extraction solvent : N-tetracontane mixture (20 mg/l) and n-decane (20 µg/l) in hexane	5 mL	506040
Test solution stearyl stearate 2 g / l in hexane	10 mL	506030

GC-MS SOLVENTS

The birth of the gas chromatogram coupled to a mass spectrometer in the early 1950's allowed the utilization of 2 technologies for the fast qualitative and quantitative determination of samples. Gas chromatography allows the separation of components in a mixture and mass spectroscopy the characterization of the identified components. Over the years, several type of mass spectrometers were coupled to a GC such as quadrupoles, ion traps and time of flight allowing for more accurate results depending on the type of samples analyzed. The evolution of the technology by the different manufacturers over the years resulted in lower detection and quantitative limits. More recently, an increase of the use and applications of 2D GC-MS has been witnessed. This technology dating back from the early 1990's gives an increase peak capacity of the GC allowing for the analysis of more complex mixtures.

Furthermore, the complexity of the samples commonly encountered for the analysis of volatile substances, and the achievement of the increasingly restrictive analytical sensitivities required by international regulations, make the interpretation of the data critical for the reliability of the final result.

The recent technological advances of GC-MS, GC-MS/MS and 2D GC-MS have opened new analytical horizons, in terms of selectivity of the result, and allowed a reduction of detection limits, reducing the need for cleaning the sample and the introduction of faster methods for sample preparation.

Product	Pkg	Code
Acetone	1 L	400952
Chloroform stabilized with ethanol	1 L	438732
Dichloromethane stabilized with amylene	1 L	463342
Dichlorométhane stabilized with ethanol	1 L	463332
Ethyl acetate	1 L	448342
n-Hexane 99 %	1 L	447212
Methanol	1 L	414952
n-Pentane 99%	1 L	468172
n-Pentane	1 L	468182

The role and the choice of the quality of the solvent is consequently crucial for the production of a precise and accurate analytical data. That is why we are introducing a new product range dedicated to the most demanding need for GC-MS. These products were specifically tested for GC/MS test for individual signals, with a retention range of C_{11} to C_{40} with a scanning area of 30-600 amu with a guarantee of less than 2µg/l of impurities.

The CARLO ERBA Reagents GC-MS solvents guarantee excellent performance, even for the analysis of the most complex mixtures. They are characterized by :

- Very high purity
- Extremely low non volatile residue content
- Functionality tested in GC-MS

PESTIPUR® SOLVENTS FOR PESTICIDES RESIDUE ANALYSIS

THE CONTROL of pesticide residues in the food and environmental sectors is remarkably important today, as these substances represent a potential public health hazard. The purity of the solvent is a determinant factor in obtaining reliable results. Thus it is essential to have products available with suitable parameters for this type of application.

To meet these needs, CARLO ERBA Reagents offers its **PESTIPUR®** line of solvents, specific for the extraction of pesticides and the analysis of chlorinated and nitrogenous residues, even at trace levels. Our products are prepared according to the most advanced distillation techniques and strictly controlled in order to guarantee the highest level of quality.

Various functionality tests ensure a stable base line in gas chromatography. For the entire **PESTIPUR®** line, the absence of critical impurities is ensured by means of precise functionality tests in GC-ECD and GC-NPD .

Product	Pkg	Code
Acetone	1 L	400991
	2,5 L	400992000
Acetonitrile	1 L	401241
	2,5 L	401242
tert-Butylmethylether	1 L	432061
	2,5 L	432062
Chloroform stabilized with amylene	1 L	438681
	2,5 L	438682
Chloroform stabilized with ethanol	1 L	438651
	2,5 L	438652
Cyclohexane	1 L	436931
	2,5 L	436932
Dichloromethane stabilized with amylene	1 L	442291
	2,5 L	442292000
	4 L	442294
Dichlorométhane stabilized with ethanol	1 L	442261
	2,5 L	442262
Diethyl ether not stabilized	1 L	447651
	2,5 L	447652
Dimethylformamide	1L	444941
Ethyl acetate	1 L	448351
	2,5 L	448352000

Product	Pkg	Code
n-Heptane 99%	1 L	446951
	2,5 L	446952
Heptane mixture of isomers	1 L	446841
	2,5 L	446842
n-Hexane 99 %	1 L	447111
	2,5 L	447112000
n-Hexane	1 L	447011
	2,5 L	447012
	4 L	447013
Hexane Mixture of isomers	1 L	447181
	2,5L	447182
Isohexane	1 L	447131
	2,5 L	447132
Isooctane	1 L	456791
	2,5 L	456792
Methanol	1 L	414930
	2,5 L	414932
n-Pentane	1 L	468161
	2,5 L	468162
Petroleum ether 40 - 65°C	1 L	447851
	2,5 L	447852
Petroleum ether 35 - 60°C	1 L	447862
	2,5 L	447861
Propan-2-ol	1 L	415281
Toluene	1 L	488591
	2,5 L	488592
	4 L	488594

ISO 17993:2002 specifies a method using high performance liquid chromatography (HPLC) with fluorescence detection for the determination of 15 selected PAHs in drinking and ground water in mass concentrations greater than 0,005 µg/l (for each single compound) and surface waters in mass concentrations above 0,01 µg/l.

To avoid additional internal validation, CARLO ERBA Reagents tests the PAH content of Dichloromethane quality PESTIPUR® according to NF EN ISO 17993: 2002 and guarantees the minimum possible interference to use.

ORGANIC STANDARDS FOR RESIDUE ANALYSIS AND ENVIRONMENTAL ANALYSIS

CARLO ERBA Reagents offers the possibility to realize tailored formulations of organic substances (pesticides, IPA, PCB, nitrogenous substances, chlorinated, etc ...) produced according to an ISO 17025 accredited Quality Management System and ISO Guide 34. Organic standard solutions are prepared according to your analytical needs for HPLC, GC and GC-MS. These solutions are custom-made standards which bring you lots of advantages :

- Time saving for preparing and controlling standard solutions
- Traceability to NIST
- Specific for instrument calibration
- No risk of precipitation mixing incompatible solutions : the best solution (two or more mixes or another solvent) is proposed if there's a problem of compatiblity.
- Exact quantity needed (from 0.5 ml in ampules or CERTAN bottles to 500 ml)

Each of our products are delivered with a certificate of analysis including :

- Batch number
- Expiry date
- Storage information
- CAS number, formula, purity of each starting material
- Gravimetric data

Send us :

- CAS number
- Concentration
- Solvent
- Volume
- Packaging

to receive our best and most suitable offer according to your needs!

ION PAIR CHROMATOGRAPHY

Ion Pair Chromatography has been developed to allow the separation of complex mixtures of polar and ionic molecules, which often are not well separated by ion exchange chromatography. The selectivity is determined by the mobile phase: the organic eluent is supplemented with a specific ion-pairing reagent. The IPC reagents are large ionic molecules having a charge opposite to the targeted analyte, as well as an hydrophobic region to interact with the stationary phase. The counter-ions combine with the ions of the eluent, becoming ion pairs in the stationary phase. Ion pairs are then separated on Reverse-phase HPLC columns.

The purity of the mobile phase and therefore the accuracy of the results depends on the quality of the additive. The specifications of our ion pair reagents are in line with the requirements of Reverse-phase HPLC :

- High purity ≥ 99%
- Minimum UV absorption in the far UV
- Controlled pH
- Loss on drying

CARLO ERBA Reagents selected the most commonly used ion pair reagents (straight-chain alkyl sulfonic acids) for your basic samples :

Product	CAS number	Pkg	Code
1-Butanesulfonic acid sodium salt	2386-54-1	25 g	405631
		100 g	405632
1-Decanesulfonic acid sodium salt	13419-61-9	25 g	405871
		100 g	405872
1-Dodecanesulfonic acid sodium salt	2386-53-0	25 g	405881
		100 g	405882
Dodecyltrimethylammonium bromide	1119-94-4	25 g	405941
		100 g	405942
1-Heptanesulfonic acid sodium salt	22767-50-6	25 g	405851
		100 g	405852
1-Hexanesulfonic acid sodium salt	2832-45-3	25 g	405621
		100 g	405622
1-Hexanesulfonic acid sodium salt monohydrate	207300-91-2	25 g	405921
		100 g	405922
1-Octanesulfonic acid sodium salt	5324-84-5	25 g	405861
		100 g	405862
		1 kg	405863
1-Octanesulfonic acid sodium salt monohydrate	207596-29-0	25 g	405931
		100 g	405932
1-Pentanesulfonic acid sodium salt	22767-49-3	25 g	405841
		100 g	405842
1-Pentanesulfonic acid sodium salt monohydrate	207605-40-1	25 g	405891
		100 g	405892
1-Propanesulfonic acid sodium salt	14533-63-2	25 g	405901
		100 g	405902
Tetrabutylammonium bisulfate	32503-27-8	25 g	405971
		100 g	405972

ULTRAPUR / SUPERPUR acids for Trace Metal analysis

- **ULTRAPUR** : Up to 65 elements certified with concentration< 10 ppt
- **SUPERPUR** : Up to 65 elements certified with concentration< 1 ppb
- Produced by sub-boiling for SUPERPUR range and double sub-boiling for ULTRAPUR range
- Packaged in dedicated clean rooms
- Available in 500ml, 1l and 2.5l according to products and range

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ION CHROMATOGRAPHY

ION CHROMATOGRAPHY is a widely used technique that separates ions and polar molecules based on their affinity to the ion exchanger. It is often used in protein purification and water analysis. It works on almost any kind of charged molecule - including large proteins, small nucleotides, and amino acids.

CONCENTRATED MOBILE PHASES

THE following eluents are filtered at 0.2µm and prepared from ultra-pure salts and 18-megaohm deionized water. These are concentrated solutions that should be diluted by a factor of 100.

They are characterized by :

- Guaranteed titer with its uncertainty
- Raw materials selected and verified against N.I.S.T. Standard Reference Materials
- Available in HDPE bottles
- Certificate of analysis with references on the analytical method, the N.I.S.T. Standard Reference Materials and the confidence interval
- Shelf life, for the unopened product package, of 2 years.

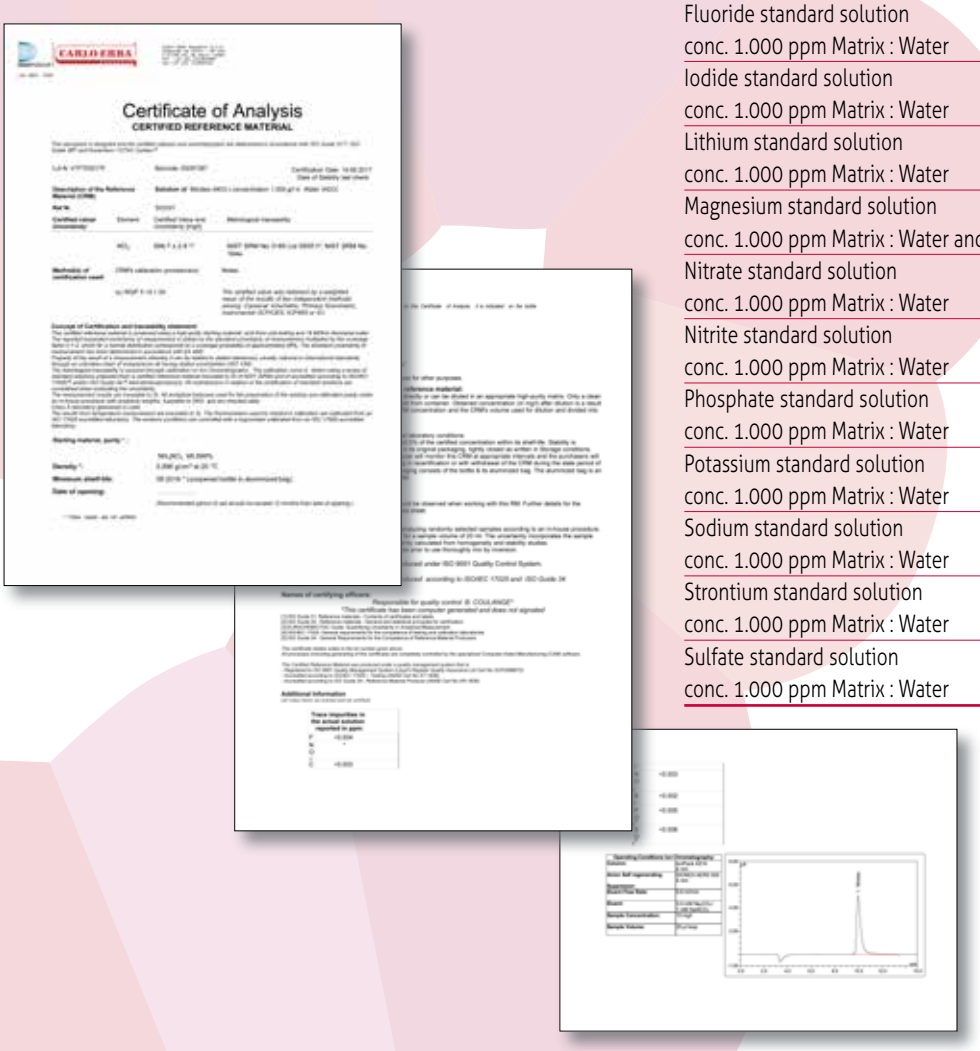
Product		Pkg	Code
Eluent sodium bicarbonate	0.17 M Sodium bicarbonate	100 mL	504534
Eluent sodium bicarbonate	0.5 M Sodium bicarbonate	1 L	507578
Eluent sodium carbonate	0.1 M Sodium carbonate	1 L	507695
Eluent sodium carbonate	0.5 M Sodium carbonate	100 mL	504533
		1 L	507577
Eluent sodium carbonate/sodium bicarbonate	0.18 M Sodium carbonate / 0.17 M Sodium bicarbonate	100 mL	504530
Eluent sodium carbonate/sodium bicarbonate	0.22 M Sodium carbonate / 0.28 M Sodium bicarbonate	100 mL	504531
Eluent sodium carbonate/sodium bicarbonate	0.35 M Sodium carbonate / 0.1 M Sodium bicarbonate	100 mL	504532

STANDARD SOLUTIONS

Our standard solutions for ion chromatography are obtained by dissolution of a high-purity salt (+99.9%) in water.

They are characterized by :

- Concentrations equal to 1000 ppm
- Guaranteed titer with its uncertainty
- Raw materials selected and verified against N.I.S.T. Standard Reference Materials
- Available in HDPE bottles
- Certificate of analysis with references on the analytical method, the N.I.S.T. Standard Reference Materials and the confidence interval
- Shelf life, for the unopened product package, of 2 years.



Product	Pkg	Code
Ammonium standard solution	100 mL	503311
conc. 1.000 ppm Matrix : Water	500 mL	503313
Bromate standard solution	100 mL	503171
conc. 1.000 ppm Matrix : Water	500 mL	503173
Bromide standard solution	100 mL	503211
conc. 1.000 ppm Matrix : Water	500 mL	503213
Calcium standard solution	100 mL	503221
conc. 1.000 ppm Matrix : Water and nitric acid	500 mL	503223
Chlorate standard solution	100 mL	503181
conc. 1.000 ppm Matrix : Water	500 mL	503183
Chloride standard solution	100 mL	503231
conc. 1.000 ppm Matrix : Water	500 mL	503233
Chlorite standard solution	100 mL	503191
conc. 1.000 ppm Matrix : Water	500 mL	503193
Chromate standard solution	100 mL	503241
conc. 1.000 ppm Matrix : Water	500 mL	503243
Cyanide standard solution	100 mL	503358
conc. 1.000 ppm Matrix : Water and nitric acid		
Fluoride standard solution	100 mL	503251
conc. 1.000 ppm Matrix : Water	500 mL	503253
Iodide standard solution	100 mL	503261
conc. 1.000 ppm Matrix : Water	500 mL	503263
Lithium standard solution	100 mL	503281
conc. 1.000 ppm Matrix : Water	500 mL	503283
Magnesium standard solution	100 mL	503291
conc. 1.000 ppm Matrix : Water and nitric acid	500 mL	503293
Nitrate standard solution	100 mL	503331
conc. 1.000 ppm Matrix : Water	500 mL	503333
Nitrite standard solution	100 mL	503321
conc. 1.000 ppm Matrix : Water	500 mL	503323
Phosphate standard solution	100 mL	503271
conc. 1.000 ppm Matrix : Water	500 mL	503273
Potassium standard solution	100 mL	503221
conc. 1.000 ppm Matrix : Water	500 mL	503223
Sodium standard solution	100 mL	503301
conc. 1.000 ppm Matrix : Water	500 mL	503303
Strontium standard solution	100 mL	503361
conc. 1.000 ppm Matrix : Water		
Sulfate standard solution	100 mL	503351
conc. 1.000 ppm Matrix : Water	500 mL	503353

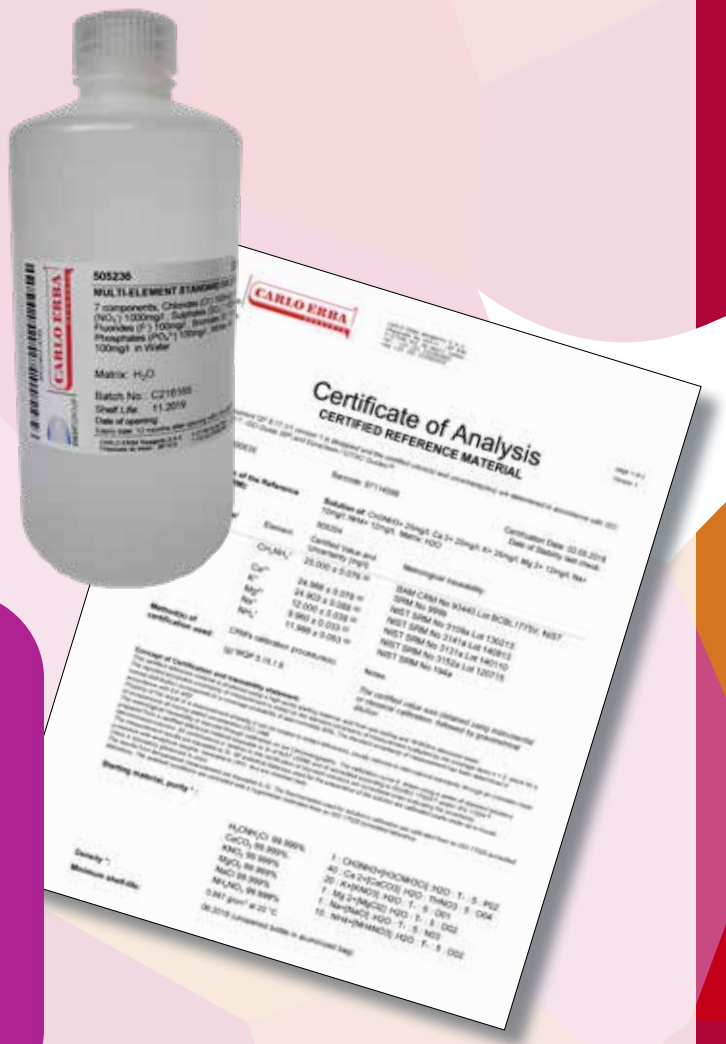
CUSTOMIZED STANDARD SOLUTIONS

CARLO ERBA Reagents offers the possibility to realize custom mixtures. It can be mono-element or multi-element. It brings you :

- Time saving for preparing and controlling standard solutions
- Traceability to NIST
- Specific for instrument calibration
- No risk of precipitation mixing incompatible solutions : the best solution (two or more mixes or another solvent) is proposed if there's a problem of compatiblity.
- Exact quantity needed (from 100 ml to 1l)

Each of our products are delivered with a certificate of analysis including :

- Batch number
- Expiry date
- Storage information
- CAS, formula, purity of each starting material
- Guaranteed titer with its uncertainty



Send us :

- **Element**
- **Concentration**
- **Solvent**
- **Volume**
- **Packaging**

to receive our best and most suitable offer according to your needs!

ERBAqua®

Discover ERBAqua®, Reagents for Karl Fischer titration

- For volumetric and coulometric titration
- Reliable reactivity
- Fast reaction
- Pyridine free
- Accurate and reproducible results
- Easy to use
- Wide range of solvents for the solubilization of the samples

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DASITGROUP | CARLO ERBA REAGENTS

www.carloerbareagents.com

ITALIA
CARLO ERBA Reagents S.r.L.
servizioclienticer@dgroup.it
Tel.: +39 02 93 99 190

FRANCE
CARLO ERBA Reagents SAS
serviceclient@cer.dgroup.it
Tél.: +33 2 32 09 20 00

ESPAÑA
CARLO ERBA Reagents S.A.
serviciocliente@cer.dgroup.it
Tel.: +34 93 693 37 35

ALL OTHER COUNTRIES
Customer Service
export@cer.dgroup.it
Ph.: +33 2 32 09 20 00

DASITGROUP | CARLO ERBA REAGENTS

CARLO ERBA Reagents S.A.S.
Chaussée du Vexin
F-27106 Val De Reuil
Ph. +33 2 32 09 20 00
Fax +33 2 32 09 20 20

export@cer.dgroup.it
www.carloerbareagents.com