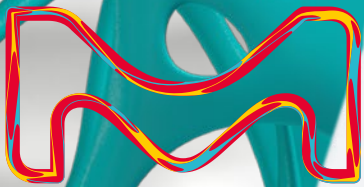


MILLIPORE
SIGMA

Reliable Research Must-Haves

Lab Reagents for everyday use



The life science
business of Merck
KGaA, Darmstadt,
Germany operates as
MilliporeSigma in the
U.S. and Canada.

Sigma-Aldrich®

Lab & Production Materials

we'll keep YOUR WORK FLOWING

Solvents and salts are used in labs every day, but it's sometimes difficult to determine the right quality grade for your application.

This comprehensive guide explains the differences between the grades and outlines common applications for each specification – to make your decisions easier, and your work smoother.

From all major reagent grades to custom and bulk sizes, MilliporeSigma supports you with all your lab essentials. Our top-quality, easy-to-use products are designed to integrate intuitively into your workflow, and produced to ensure reliable research every day. Explore an unparalleled portfolio for your breakthrough ideas.



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core solvents

Every grade your lab needs

Grade Definitions & Common Applications

Puriss p.a.

Applications: Specialized or Sensitive Chemical Synthesis & Catalysis, Reaction Monitoring, Metal-Sensitive Reactions, Highly Sensitive Purification

These high-quality solvents offer specifications that match or exceed existing regulations and undergo stringent metals testing. They are the optimal choice for demanding regulated applications that require quality documentation, and for impurity-sensitive reactions or extractions.

ACS Grade

Applications: Routine Chemical Synthesis, Drying & Purification, Critical Labware Cleaning

ACS solvents meet or exceed the high standards of the American Chemical Society (ACS), with test specifications that are specialized to every compound. Ideal for most research needs, these high-quality solvents deliver replicable, publishable results.

ReagentPlus® Grade

Applications: Trial Synthesis, Initial Extraction, General Chemical Synthesis, Purification, Cleaning

With a guaranteed purity $\geq 98.5\%$, ReagentPlus® solvents are ideal for trial synthesis, preparation, experiments that need fewer specifications, or applications that require innovative solutions not yet defined by ACS (e.g. our emerging green solvent line). They are primarily defined by assay specifications, and offer suitable quality for general lab use.

Reagent Grade

Applications: General Chemical Synthesis, Purification & Cleaning

Defined by assay profile and offering $\geq 95\%$ purity, Reagent Grade solvents are the perfect choice for very general lab applications, such as cleaning.

Essential Core Solvents (selection)

Product Description	Cat. No.
ACS / Puriss Grade	
Acetone, ACS reagent , ≥99.5%	179124
Acetonitrile, ACS reagent , ≥99.5%	360457
<i>tert</i> -Butyl methyl ether, ACS reagent , ≥99.0%	443808
Dichloromethane, contains 40-150 ppm amylene as stabilizer, ACS reagent , ≥99.5%	D65100
Diethyl ether, anhydrous, ACS reagent , ≥99.0%, contains BHT as inhibitor	673811
<i>N,N</i> -Dimethylformamide, ACS reagent , ≥99.8%	319937
Dimethyl sulfoxide, puriss. p.a. , ACS reagent , ≥99.9% (GC)	41640
1,4-Dioxane, ACS reagent , ≥99.0%	360481
Ethyl alcohol, Pure, 200 proof, ACS reagent , ≥99.5%	459844
Methanol, ACS reagent , ≥99.8%	179337
1-Propanol, ACS reagent , ≥99.5%	402893
Toluene, ACS reagent , ≥99.5%	179418

Product Description	Cat. No.
ReagentPlus® / Reagent Grade	
<i>N,N</i> -Dimethylacetamide, ReagentPlus® , 99%	D137510
Dimethyl sulfoxide, ReagentPlus® , ≥99.5%	D5879
Ethyl alcohol, Pure, 200 proof, meets USP testing specifications	493546
Ethyl alcohol, denatured, reagent grade	187380
Formamide, ReagentPlus® , ≥99.0% (GC)	F7503
1-Hexanol, reagent grade , 98%	H13303
Isopropyl acetate, ≥99.6%	537462
Methanol, Absolute - Acetone free	M1775
Pentane, reagent grade , 98%	158941
Tetrahydrofuran, ReagentPlus® , ≥99.0%, contains 250 ppm BHT as inhibitor	178810



DISCOVER MORE

Visit our Solvent Center – including over 120 ACS Grade Solvents

[SigmaAldrich.com/solvents](https://www.sigmaaldrich.com/solvents)





specialty solvents

Anhydrous, Biotech & NMR

Anhydrous solvents

Applications: Chemical Synthesis,
Water-Sensitive Reaction

Our high-purity anhydrous solvents are known for their extremely low water levels, and specifically produced for moisture-sensitive chemistry and biotech applications.

Product Description	Cat. No.
Acetonitrile, anhydrous, 99.8%	271004
Dichloromethane, anhydrous, ≥99.8%, contains 40-150 ppm amylene as stabilizer	270997
N,N-Dimethylformamide, anhydrous, 99.8%	227056
Dimethyl sulfoxide, anhydrous, ≥99.9%	276855
Ethyl alcohol, Pure, 200 proof, anhydrous, ≥99.5%	459836
2-Propanol, anhydrous, 99.5%	278475
Pyridine, anhydrous, 99.8%	270970
Tetrahydrofuran, anhydrous, ≥99.9%, inhibitor-free	401757
Tetrahydrofuran, anhydrous, contains 250 ppm BHT as inhibitor, ≥99.9%	186562
Toluene, anhydrous, 99.8%	244511



Learn more on
SigmaAldrich.com/anhydrous



Sure/Seal™

Choose from the largest range of high-quality anhydrous solvents with exceptionally low water levels. Rest assured that each product is perfectly protected with our innovative, moisture-inhibiting Sure/Seal™ system.

We use three different types of materials to ensure complete compatibility with contents, and easier handling for you. Sure/Seal™ bottles come in several sizes, ranging from 100 mL to 2 L.

Innovative plug style

- Maximum surface area contact (liner to bottle) to exclude moisture and oxygen
- More than 50% thicker than competing brands to ensure low water content for entire shelf life

Outstanding elastomer and crimp cap design

- Air-tight system to protect product quality
- Excellent resealing properties
- Secondary resin layer ensures resistance to chemicals
- Outperforms competitors' seals in moisture prevention
- Three unique plug-style liners to suit a wide range of solvents and solutions

Highest quality anhydrous solvents

- Always maintains exceptionally low water content
- More than 90 products in different categories, including common air and/or moisture-sensitive, volatiles, and strong odors
- Various size offerings, from 100 mL to 2 L (Larger size of one-way container also available in North America)



Biotech solvents

Applications: Protein synthesis, extraction, and purification

Our biotech solvents are characterized by low water content, minimal residues, and clean UV spectra. They can be used for RNA extraction for genetic testing or research, eg, PCR.

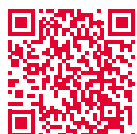
Product Description	Cat. No.
Acetonitrile, biotech. grade, $\geq 99.93\%$	494445
Chloroform, contains 100-200 ppm amylenes as stabilizer, $\geq 99.5\%$	C2432
N,N-Diisopropylethylamine, 99.5%, biotech. grade	496219
N,N-Dimethylformamide, biotech. grade, $\geq 99.9\%$	494488
Ethyl alcohol, Pure, 200 proof, for molecular biology	E7023
Heptane, biotech. grade, $\geq 99\%$	494526
1-Methyl-2-pyrrolidinone, biotech. grade, $\geq 99.7\%$	494496
Trifluoroacetic acid, $\geq 99\%$, for protein sequencing	299537
OmniPur Water, WFI Quality, Sterile Purified Water, Cell Culture Tested	486505

NMR solvents

Application: Nuclear Magnetic Resonance (NMR)

We offer a wide range of high-quality NMR solvents to ensure the reliability of your analytical work.

Product Description	Cat. No.
Acetonitrile-d ₃ , ≥ 99.8 atom % D	151807
Benzene-d ₆ , 99.6 atom % D	151815
Chloroform-d, 99.8 atom % D	151823
Chloroform-d, 99.8 atom % D, contains 0.03 % (v/v) TMS	225789
Deuterium oxide, 99.9 atom % D	151882
Deuterium oxide, 99.8 atom % D	617385
Dichloromethane-d ₂ , 99.9 atom % D	444324
N,N-Dimethylformamide-d ₇ , ≥ 99.5 atom % D	189979
Dimethyl sulfoxide-d ₆ , 99.9 atom % D	151874
Dimethyl sulfoxide-d ₆ , 99.5 atom % D	175943
Dimethyl sulfoxide-d ₆ , 99.9 atom % D, contains 0.03 % (v/v) TMS	296147
Methanol-d ₄ , ≥ 99.8 atom % D	151947



Learn more on
SigmaAldrich.com/biotech-solvents



Learn more on
SigmaAldrich.com/nmr



salts, Acids & Bases

Every grade your lab needs

Grade Definitions & Common Applications

Puriss p.a.

Applications: Sensitive Reactions & Syntheses,
Metal-Sensitive Applications

These high-quality salts, acids and bases offer specifications that match or exceed existing regulations and undergo stringent metals testing. They are designed for use in demanding regulated applications that require quality documentation.

ACS Grade

Applications: General Lab Use, Routine Chemical Synthesis Workup,
Drying & Purification, Academic Teaching Labs

ACS solvents meet or exceed the high standards of the American Chemical Society (ACS), with test specifications that are specialized to every compound. Ideal for most research needs, these high-quality solvents deliver replicable, publishable results.

ReagentPlus® Grade

Applications: General Chemical Synthesis, Purification, Cleaning

With a guaranteed purity of $\geq 98.5\%$, and few other specification requirements, ReagentPlus® inorganic salts, acids and bases are ideal for initial experimental workups, which do not require as many specification controls, or for compounds that will be further purified after the reaction or process is completed.

Reagent Grade

Applications: General Lab Use, General Chemical Synthesis,
Purification, Cleaning

Reagent Grade inorganic salts, acids and bases are $\geq 95\%$ pure assays, thus suitable for general lab applications and tests with low specification controls.

Innovative solutions

Redi-Dri™ free-flowing salts



**Reduce waste & effort –
Increase safety & savings**

Redi-Dri™ is an innovative product line that eliminates clumps in a broad range of common hygroscopic salts and buffers. Our unique packaging process gives you high-quality, free-flowing, ready-to-use materials – without any chemical additives, anti-clumping agents, or hydrophobic compounds.

Product Description	Cat. No.
Redi-Dri™ Salts	
Cesium chloride, anhydrous, free-flowing, Redi-Dri™, ReagentPlus® , 99.9%	746487
Magnesium sulfate, anhydrous, free-flowing, Redi-Dri™, ReagentPlus® , ≥99.5%	746452
Potassium iodide, anhydrous, free-flowing, Redi-Dri™, ACS reagent , ≥99%	746428
Potassium phosphate monobasic, anhydrous, free-flowing, Redi-Dri™, ACS reagent , ≥99%	795488
Sodium chloride, anhydrous, Redi-Dri™, free-flowing, ACS reagent , ≥99%	746398
Zinc chloride, anhydrous, free-flowing, Redi-Dri™, reagent grade , ≥98%	793523

Essential Inorganics (selection)

Product Description	Cat. No.
ACS / Puriss Grade Salts and Inorganics	
Gold(III) chloride trihydrate, ACS reagent , ≥49.0% Au basis	G4022
Hydrogen peroxide solution, contains inhibitor, 30 wt. % in H ₂ O, ACS reagent	216763
Iodine, ACS reagent , ≥99.8%, solid	207772
Potassium phosphate dibasic, ACS reagent , ≥98%	P3786
Silver nitrate, ACS reagent , ≥99.0%	209139
Sodium chloride, ACS reagent , ≥99.0%	S9888
Sodium perchlorate, ACS reagent , ≥98.0%	410241
Sodium phosphate monobasic monohydrate, ACS reagent , ≥98%	S9638
ReagentPlus® / Reagent Grade Acids, Bases and Salts	
Acetic acid, glacial, ReagentPlus® , ≥99%	A6283
Calcium chloride, anhydrous, granular, ≤7.0 mm, ≥93.0%	C1016
Cesium chloride, anhydrous, free-flowing, Redi-Dri™, ReagentPlus® , 99.9%	746487
Iron(III) chloride, reagent grade , 97%	157740
Formic acid, reagent grade , ≥95%	F0507
Lithium bromide, ReagentPlus® , ≥99%	213225
Sodium chloride, ReagentPlus® , ≥99%	S9625
Sodium hydroxide solution, 50% in H ₂ O	415413
Sodium hypochlorite solution, reagent grade , available chlorine 4.00-4.99 %	239305
Titanium(IV) chloride, ReagentPlus® , 99.9% trace metals basis	208566
Trifluoroacetic acid, ReagentPlus® , 99%	T6508
Absorbents	
Activated charcoal, DARCO®, -100 mesh particle size, powder	242276
Aluminum oxide, activated, basic, Brockmann I	199443
Celite® 545, filter aid, treated with sodium carbonate, flux calcined	22140
Magnesium sulfate, anhydrous, ReagentPlus® , ≥99.5%	M7506
Molecular sieves, 4 Å, beads, 8-12 mesh	208604
Sand, 50-70 mesh particle size	274739



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Learn more on SigmaAldrich.com/redi-dri



GREENER Alternative solvents



Safer for you and the planet

With our greener solvent alternatives, you no longer have to choose between sustainability and reliability. They offer the same excellent quality you know from MilliporeSigma, but they're sustainably produced, so they won't compromise your work or the environment.

All of these solvents are greener, either in the processing of the chemical (**BioRenewable**), or the environmental impact of the solvent during production, use, and disposal (**Greener Substitutes**).

BioRenewable ●

Our new BioRenewable solvents are derived from waste feedstock to reduce consumption of non-renewable resources. They do not contain many contaminants typically present in their petroleum-based counterparts, but behave identically, so they can be easily used as drop-in replacements. As they do not rely on crude oil, they also offer more stable pricing and availability, making them a reliable, long-term solution in solvent production.

Greener Substitutes ●

Our Greener Substitutes are replacements for traditional solvents that pose health or environmental risks. They save energy and costs through: cleaner solvent/water separations, less water waste, easier distillation for solvent recovery, and faster reaction times (their higher boiling points and lower volatile organic compounds allow use at higher temperatures).

	Product Description	Cat. No.
● ●	Acetone, 100% BioRenewable, ACS reagent , ≥99.5%	904082
● ●	1-Butanol, BioRenewable, ACS reagent , ≥99.4%	901351
● ●	Cyrene™ BioRenewable	807796
● ●	Dimethyl isosorbide, BioRenewable, ReagentPlus® , ≥99%	906832
● ●	2-Methyltetrahydrofuran, BioRenewable, anhydrous, ≥99%, Inhibitor-free	673277
● ●	2-Methyltetrahydrofuran, BioRenewable, ReagentPlus® , ≥99.5%, contains 150-400 ppm BHT as stabilizer	155810
● ●	2-Propanol, BioRenewable, ReagentPlus® , ≥99.5%	909955
● ●	Cyclopentyl methyl ether, inhibitor-free, anhydrous, ≥99.9%	791962
● ●	Cyclopentyl methyl ether, contains 50 ppm BHT as inhibitor, anhydrous, ≥99.9%	675970
● ●	Cyclopentyl methyl ether, contains 50 ppm BHT as inhibitor, ReagentPlus® , ≥99.90%	675989
● ●	Ethyl acetate/Ethanol 3:1 (v/v) solution, (Ethyl acetate solution with 26.2% v/v SDA 35A), for HPLC	745588

● = BioRenewable ● = Greener Substitutes



Learn more on
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scalable options

Wide choice of pack sizes from bench to bulk

Going from research to production? We'll help you get there quickly and confidently with our comprehensive range of innovative chemicals available from bench to bulk volumes. Enjoy expert technical support for your commercialization needs – with enhanced quality, compliance, documentation, and delivery.



R&D

Comprehensive portfolio of products and services

- Broad inventory of key starting materials for R&D
- Extensive range
- Expert consultation for product selection
- Extensive web-based resources and same day delivery

Scale up

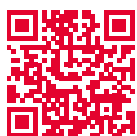
Smooth transition from R&D to commercialization

- Fit-for-use reagents
- Customization needs:
 - Make to order
 - Pack to order
 - Test to order
- Lot-to-lot consistency, in-house quality testing with comprehensive traceability and safety documentation

Manufacturing

Support in supply and use of raw materials for manufacturing

- Risk mitigation and assessment
- Strong global supply chain
- Enhanced quality program including change control notification
- Contract manufacturing and OEM capabilities
- Proven technology transfer and project management to keep your needs on track



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Lit. No. MS_BR5766EN Ver. 1.0
07/2020