CHROMATOGRAPHY
& SEPARATIONS CATALOG

REGIS® TECHNOLOGIES, INC.

Serving the Scientific Community Since 1956

WWW.REGISTECH.COM

CONSUMABLES & SERVICES
2015

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Regis Technologies, Inc. has a long tradition of serving the analytical needs of scientists and researchers world-wide with its vast array of chromatographyproducts and technical assistance. Regis manufactures an extensive line of chromatography stationary phases and high purity GC derivatization reagents. Regis is the exclusive manufacturer of Pirkle-Type Chiral Stationary Phases for analytical, semi-preparative and preparative applications and separations. Regis is also the exclusive manufacturer of many other specialty HPLC phases. Research and development are essential parts of our chromatography business that allows us to introduce new and innovative products that meet the needs of our customers.

Our high purity reagents and HPLC columns are manufactured on-site according to controlled manufacturing procedures, and must meet strict quality control specifications before release. A full customer service and sales staff is available to answer questions and take orders. Regis also has a complete applications laboratory and knowledgeable technical support staff. With years of chromatography experience, our support staff is dedicated to assisting customers with method development and column or reagent selection.

We are committed to our customer. With this in mind, you can expect Regis Technologies to provide the highest quality products, services and technical support as we continue to grow and meet the challenges of the future.

CHIRAL CHROMATOGRAPHY

CHIRAL CHROMATOGRAPHY

Free Chiral Screening

Find the Right Stationary Phase Fast

Regis is pleased to offer a free chiral screening service in which we will assess your racemate for possible analytical or preparative chiral separation.

1. Submit a small amount of your racemate with a sample submission form
2. Regis will screen your sample against our library of chiral stationary phases under HPLC or SFC mobile phases to identify a chiral column and method suitable for your separation needs
3. If a preparative SFC chiral separation is required, Regis will also screen your racemate in its extended chiral column library
4. Results are typically returned in 3 business days

The process is simple and includes completing a confidentiality agreement, if desired, our Chiral Screening submission form, and sending your compound to Regis.

Start Today

1. Print the form on the next page, or download it here.
2. Request a confidentiality agreement, if desired, by email from sales@registech.com.
3. Email your completed form(s) to sales@registech.com.
4. Send in your sample to:

Regis Technologies, Inc.
Attn: SFC Separations
8210 Austin Ave.
Morton Grove, IL
USA 60053

We Can Help

For details or questions about your free chiral screening, email:

Chromatography Support Staff
sales@registech.com

8210 Austin Ave.
Morton Grove, IL 60053, USA
Phone: 847-967-6000
Fax: 847-967-1214

HPLC/SFC Chiral Screen Submission Sheet

Contact Information:

Submission Date: _____

Primary Contact: _____

Alternate Contact: _____

Company: _____

Address: _____

City: _____

State: _____ Zip Code: _____

Country: _____

Phone: _____ Fax: _____

Email: _____

Compound Structure/Name
Or attach separately

Name: _____

Separation Requirements:

Analytical HPLC? ☐ SFC? ☐
Preparative SFC? ☐
If yes, projected separation quantity _____
nonGMP ☐ cGMP ☐

Do you want this screening sample returned?

Yes ☐ No ☐

Note: All screening samples are destroyed after analysis is complete. No peaks are collected during the screening and any isolation work requires an additional quote.

Safety and Handling

MSDS Available
(*If yes, include a copy with sample*) Yes ☐ No ☐
Hazardous Material: Yes ☐ No ☐
Storage Conditions
(*ambient if left blank*): _____

Special Handling Requirements:

_____

Properties and Appearance:

Powder ☐ Crystalline ☐ Oil ☐

Color: _____

λ_{max}(nm): _____

Chemical Purity (%AUC): _____

Known Chiral Chromatographic Methods: (***Please include a copy of any chromatograms***)

Column: _____

Manufacturer: _____

Mobile Phase: _____

Flow Rate: _____ Wavelength (nm): _____

PRINT THIS PAGE OR CLICK ABOVE TO DOWNLOAD THE PDF

REGIS® TECHNOLOGIES, INC.

8210 Austin Ave.
Morton Grove, IL 60053, USA
Phone: 847-967-6000
Fax: 847-967-1214

Stability

Light:	Stable ☐	Decomposes ☐	Unknown ☐
Moisture:	Stable ☐	Decomposes ☐	Unknown ☐
Temp (> 40°C)	Stable ☐	Decomposes ☐	Unknown ☐

Acids

Acetic Acid (>1%)	Stable ☐	Decomposes ☐	Unknown ☐
Trifluoroacetic Acid (>1%)	Stable ☐	Decomposes ☐	Unknown ☐

Bases

Triethylamine (>1%)	Stable ☐	Decomposes ☐	Unknown ☐
Diethylamine (>1%)	Stable ☐	Decomposes ☐	Unknown ☐

Solubility

Water	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Methanol	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Ethanol	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
2-Propanol	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Hexanes	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Ethyl Acetate	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
CH_2Cl_2	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Chloroform	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Acetonitrile	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐

Other: _____

COMMENTS:

Instructions:

Please send or email this completed form along with your sample(s) to:

teds@registech.com

Ted Szczerba
8210 Austin Ave.
Morton Grove, IL 60053-051

We would like to have at least 10-20 mg of sample. If you are unable to send us 10 mg, you must include sufficient solubility information. If the compound you are sending is not commercially available, please inquire if you need a confidentially agreement signed before you send us your sample.

CHIRAL CHROMATOGRAPHY: SCREENING SUBMISSION FORM

In 1980, Regis Technologies along with Professor William Pirkle of the University of Illinois introduced the Pirkle Chiral Stationary Phases.

These Chiral Stationary Phases offer many advantages:

- Enantiomer separation on a wide variety of compound groups
- Column durability resulting from covalent phase bonding
- Ability to invert elution order
- Availability of analytical- to preparative-sized columns and bulk packing material
- Universal solvent compatibility

Enantiomer Separation

Regis manufactures 9 Pirkle CSPs. These can separate a wide variety of enantiomers in numerous compound groups.

Examples include:

- Aryl Propionic Acid Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
- Agricultural Compounds
- Natural Products
- ß-Blockers
- Many Pharmaceuticals

Additional examples of enantiomer separations can be found in the Regis Chiral Application Guide or on our Web site at www.registech.com/chiral. Our website is updated monthly with new applications and current chiral events.

View our Chiral Applications online at registech.com/chiral-applications

Column Durability

The Pirkle CSPs are covalently bonded to the silica, providing excellent column durability. Covalently bonded phases assure long-lasting columns and offer added benefits for preparative columns. Our covalently bonded preparative columns are longer lasting than their coated preparative column counterparts because noncovalent coatings can leach off. Additional benefits include the columns' capacity to tolerate sample overload.

Ability to Invert Elution Order

An important advantage of the Pirkle CSPs is the ability to invert elution order by using the same type of CSP, but with the opposite absolute configuration. As a result, it is possible to have the trace enantiomer elute before the major—a desirable feature for enantiomeric purity determinations. For preparative separations it is beneficial to elute the desired component first.

Analytical and Preparative-Sized Columns

All of Regis' Pirkle HPLC columns are available in both analytical and preparative sizes. Since all chiral stationary phases are manufactured on-site, Regis can pack special or custom-sized columns quickly and easily.

Universal Solvent Compatibility

Choice of mobile phase is not a limitation with the Pirkle HPLC columns. They are compatible with most mobile phases. The pH of the mobile phase, however, must be between 2.5 and 7.5. Both normal-phase and reversed-phase modes can be used, although normal-phase is most common. For normal-phase separations, the classic mobile phase is a binary or ternary mixture of a hydrocarbon and a modifier, usually an aliphatic alcohol.

Typical uncharged organic modifers include ethanol, isopropanol and butanol. Under reversed-phase conditions, water-alcohol mixtures, or aqueous phosphate buffers with charged organic modifiers are also employed.

Supercritical Fluid Chromatography (SFC)

Utilizing carbon dioxide is now a proven technique for the separation of enantiomers using Pirkle CSPs. Read more starting on page 44.

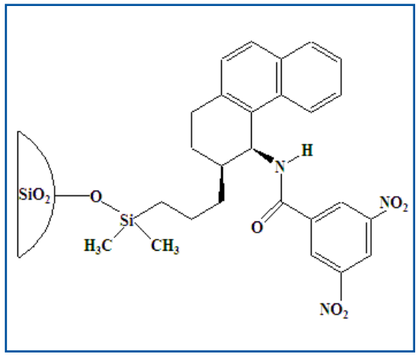
3 & 3.5 µm Material

To respond to the need of a greater variety of analytical columns, Regis has expanded column availability on the following products:

- RegisPack™
- RegisPack CLA-1™
- RegisCell™
- Whelk-O® 1

Shorter column length benefits analytical scientists who have standardized their method development to the smaller particle size with reduced analysis time and less solvent usage.

Whelk-O® 1, Kromasil



Particle Size	Column Dimensions	(S,S) Catalog #	(R,R) Catalog #
3.5 µm	5 cm x 4.6 mm	1-780120-300	1-780220-300
	10 cm x 4.6 mm	1-780121-300	1-780221-300
	15 cm x 4.6 mm	1-780122-300	1-780222-300
	25 cm x 4.6 mm	1-780123-300	1-780223-300
	15 cm x 3.0 mm	1-780124-300	1-780224-300
	10 cm x 3.0 mm	1-780125-300	1-780225-300
	5 cm x 3.0 mm	1-780126-300	1-780226-300
	2 cm x 3.0 mm	1-780127-300	1-780227-300
	5 cm x 2.1 mm	1-780128-300	1-780228-300
	10 cm x 2.1 mm	1-780129-300	1-780229-300
	15 cm x 2.1 mm	1-780130-300	1-780230-300
5 µm	25 cm x 4.6 mm	1-780101-300	1-780201-300
	25 cm x 10 mm	1-780102-300	1-780202-300
	25 cm x 30 mm	1-780103-300	1-780203-300
	25 cm x 50 mm	1-780104-300	1-780204-300
	15 cm x 4.6 mm	1-780105-300	1-780205-300
	15 cm x 2.1 mm	1-780106-300	1-780206-300
	25 cm x 21.1 mm	1-780107-300	1-780207-300
	15 cm x 30 mm	1-780108-300	1-780208-300
	15 cm x 21.1 mm	1-780109-300	1-780209-300
	10 cm x 21.1 mm	1-780110-300	N/A
	10 cm x 4.6 mm	1-780151-300	1-780251-300
	5 cm x 4.6 mm	1-780152-300	1-780252-300
	3 cm x 4.6 mm	1-780153-300	1-780253-300
	10 cm x 2.1 mm	1-780154-300	1-780254-300
	5 cm x 2.1 mm	1-780155-300	1-780255-300
	3 cm x 2.1 mm	1-780156-300	1-780256-300
10 µm	15 cm x 4.6 mm	1-786251-300	1-786252-300
	25 cm x 4.6 mm	1-786615-300	1-786515-300
	30 cm x 4.6 mm	N/A	1-786517-300
	15 cm x 21.1 mm	1-786617-300	1-786516-300
	25 cm x 10 mm	1-786625-300	1-786518-300
	25 cm x 21.1 mm	1-786635-300	1-786525-300
	50 cm x 21.1 mm	1-786645-300	1-786535-300
	25 cm x 30 mm	1-786702-300	1-786545-300
	25 cm x 50 mm	1-786703-300	1-786708-300
	50 cm x 50 mm	1-786704-300	1-786709-300
	50 cm x 30 mm	1-786716-300	1-786710-300
	5cm x 2.1 mm	1-786902-300	1-786713-300
	5 cm x 4.6 mm	1-786906-300	1-786903-300
	10 cm x 4.6 mm	1-786908-300	1-786907-300
16µm	25 cm x 4.6 mm	1-786351-300	1-786361-300

Bulk packaging is available for 5 µm, 10 µm, and 16 µm material
Bulk packaging and Select Sizes of 20 µm material are available with YMC silica
Select sizes are also available with Exsil silica

Whelk-O® 1

1-(3,5-dinitrobenzamido)-1,2,3,4-tetrahydrophenanthrene

The Whelk-O 1 is useful for the separation of underivatized enantiomers in a number of families including amides, epoxides, esters, ureas, carbamates, ethers, aziridines, phosphonates, aldehydes, ketones, carboxylic acids, alcohols and non-steroidal antiinflammatory drugs (NSAIDs). This -electron acceptor/-electron donor phase exhibits an extraordinary degree of generality. The broad versatility observed on the Whelk-O 1 column compares favorably with polysaccharid-ederived chiral stationary phases.

In addition, because Whelk-O 1 is covalently bonded to the support, the phase is compatible with all commonly used mobile phases, including aqueous systems — a distinct advantage over polysaccharide derived chiral stationary phases. Other advantages include column durability, excellent efficiency, ability to invert elution order and excellent preparative capacity.

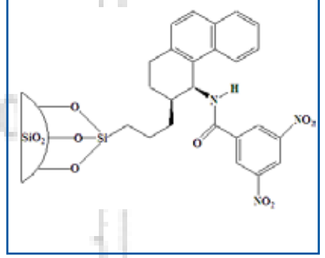
Compatible with aqueous systems

ULMO

WHELK-O® 2

ANALYTICAL TO PREPARATIVE COLUMNS

Our newest addition to the Whelk-O line of chiral stationary phases is the Whelk-O 2. The Whelk-O 2 is the covalent trifunctional version of the Whelk-O 1. The Whelk-O 2 retains the same chiral selector but incorporates a trifunctional linkage to the silica support. In most cases, the enantioselectivity remains the same as that obtained with the Whelk-O 1. Whelk-O 2 was designed to improve the resistance of the stationary phase to hydrolysis while using strong organic modifiers such as trifluoroacetic acid. The Whelk-O 2 is ideal for preparative separations since the material is bonded on 10 µm, 100Å spherical Kromasil silica. This allows the preparative chromatographer to perform method development on an analytical column and immediately scale up to larger diameter columns.



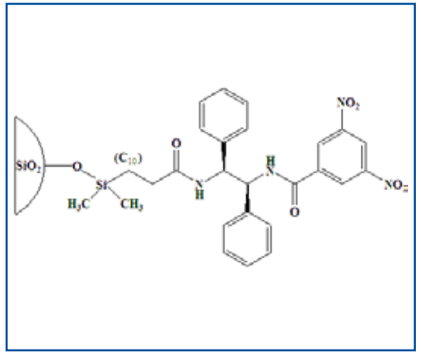
PARTICLE SIZE	COLUMN DIMENSIONS	(S,S) CATALOG #	(R,R) CATALOG #
10 µm	15 cm x 2.1 mm	1-786953-300	1-786952-300
	10 cm x 4.6 mm	1-786910-300	1-786911-300
	15 cm x 4.6 mm	1-786447-300	1-786446-300
	25 cm x 4.6 mm	1-786415-300	1-786315-300
	25 cm x 10 mm	1-786425-300	1-786325-300
	25 cm x 21.1 mm	1-786435-300	1-786335-300
	50 cm x 21.1 mm	1-786445-300	1-786345-300
	25 cm x 30 mm	1-786721-300	1-786727-300
	25 cm x 50 mm	1-786722-300	1-786728-300
	50 cm x 50 mm	1-786723-300	1-786729-300
	50 cm x 30 mm	1-786736-300	1-786732-300
	50 cm x 4.6 mm	N/A	1-786912-300
16 µm	25 cm x 4.6 mm	1-786455-300	N/A

BULK PACKAGING IS AVAILABLE FOR 16 µM MATERIAL

ULMO

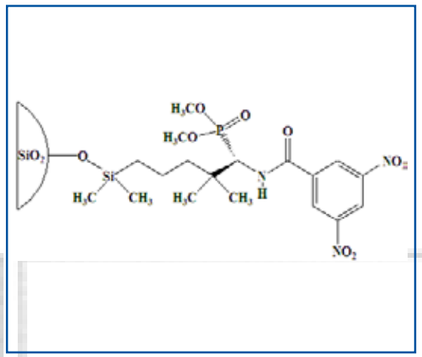
ANALYTICAL TO PREPARATIVE COLUMNS

The ULMO chiral stationary phase was developed by Austrian researchers Dr. Georg Uray, Dr. Wolfgang Linder and Dr. Nobert Maier. The ULMO CSP is based on a 3,5-dinitrobenzoyl derivative of diphenylethylenediamine. This CSP has a general ability to separate the enantiomers of many racemate classes and is particularly good at separating the enantiomers of aryl carbinols.



PARTICLE SIZE	COLUMN DIMENSIONS	(S,S) CATALOG #	(R,R) CATALOG #
5 µm	5 cm x 2.1 mm	1-787647-300	1-787648-300
	15 cm x 2.1 mm	1-787900-300	1-787901-300
	15 cm x 4.6 mm	1-787015-300	1-787016-300
	25 cm x 4.6 mm	1-787100-300	1-787200-300
	25 cm x 4.6 mm*	N/A	1-787253-300
	5 cm x 4.6 mm	1-787649-300	1-787650-300
	10 cm x 4.6 mm	1-787651-300	1-787652-300
	25 cm x 10 mm	1-787101-300	1-787201-300
	25 cm x 30 mm	1-787103-300	1-787203-300
10 µm	15 cm x 4.6 mm	1-787020-300	1-787021-300
	25 cm x 4.6 mm	1-787300-300	1-787400-300
	25 cm x 10 mm	1-787301-300	1-787401-300
	25 cm x 21.1 mm	1-787102-300	1-787202-300
	25 cm x 30 mm	1-787701-300	1-787707-300
	50 cm x 30 mm	1-787715-300	1-787712-300
	25 cm x 50 mm	1-787702-300	1-787708-300
	50 cm x 50 mm	1-787703-300	1-787709-300
16 µm	25 cm x 4.6 mm	1-787500-300	1-787600-300
	25 cm x 10 mm	1-787501-300	1-787601-300
	25 cm x 21.1 mm	1-787502-300	1-787602-300

BULK PACKAGING IS AVAILABLE FOR 5 µM, 10 µM, AND 16 µM MATERIAL
*KROMASIL SILICA

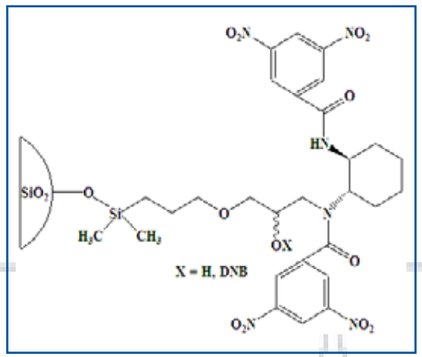


Alpha Burke 2

Analytical & Semi-Preparative Columns

The α-Burke 2 phase is derived from dimethyl N-3,5-dinitro-benzoyl--amino-2,2-dimethyl- 4-pentenyl phosphonate covalently bound to 5 µm silica. This π-acceptor chiral stationary phase is particularly valuable in the HPLC separation of ß-blocker enantiomers, an important class of cardiovascular drugs whose enantiomers often exhibit differing pharmacological activities. The α-Burke 2 has been specifically designed to separate the enantiomers of ß-blockers without chemical derivatization. In addition, it also resolves the enantiomers of many compounds separated on π-acceptor Pirkle type chiral stationary phases.

Particle Size	Column Dimensions	(S) Catalog #	(R) Catalog #
5 µm	5 cm x 2.1 mm	1-731603-300	1-731602-300
	5 cm x 4.6 mm	1-731614-300	1-731613-300
	10 cm x 4.6 mm	1-731626-300	1-731625-300
	25 cm x 4.6 mm	1-735037-300	1-735035-300
	15 cm x 4.6 mm	1-735250-300	1-735150-300
	25 cm x 10 mm	1-735237-300	1-735235-300
	25 cm x 21.1 mm	1-735238-300	1-735236-300



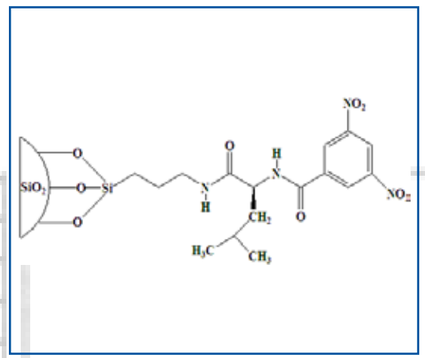
Dach-DNB

Analytical to Preparative Columns

The innovative DACH-DNB CSP was designed by Italian chemist, Professor Francesco Gasparrini, at Rome University La Sapienza. The DACH-DNB CSP, which contains the 3,5-dinitrobenzoyl derivative of 1,2-diaminocyclohexane, has been found to resolve a broad range of racemate classes including amides, alcohols, esters, ketones, acids, sulfoxides, phosphine oxides, selenoxides, phosphonates, thiophosphineoxide, phosphineselenide, phosphine-borane, beta-lactams, organometallics, atropisomers and heterocycles.

Particle Size	Column Dimensions	(S) Catalog #	(R) Catalog #
5 µm	5 cm x 2.1 mm	1-731603-300	1-731602-300
	5 cm x 4.6 mm	1-731614-300	1-731613-300
	10 cm x 4.6 mm	1-731626-300	1-731625-300
	25 cm x 4.6 mm	1-735037-300	1-735035-300
	15 cm x 4.6 mm	1-735250-300	1-735150-300
	25 cm x 10 mm	1-735237-300	1-735235-300
	25 cm x 21.1 mm	1-735238-300	1-735236-300

Dach-DNB (opposite page)

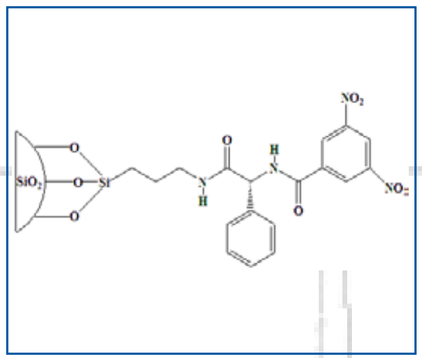


Leucine

Analytical & Semi-Preparative Columns

The π-acceptor leucine CSP is based on 3,5-dinitrobenzoyl leucine, covalently bonded to 5 µm aminopropyl silica. Columns derived from either L- or D- leucine are available. This phase demonstrates enhanced enantioselectivities for several classes of compounds, including benzodiazapines.

Particle Size	Column Dimensions	D- Catalog #	L- Catalog #
5 µm	15 cm x 4.6 mm	1-731015-300	1-731016-300
	25 cm x 4.6 mm	1-731054-300	1-731041-300
	25 cm x 10 mm	1-731254-300	1-731241-300
	25 cm x 21.1 mm	1-731354-300	1-731341-300



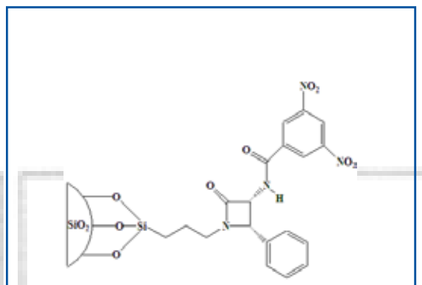
Phenylglycine

Analytical & Semi-Preparative Columns

Phenylglycine, a π-acceptor chiral phase, is based on 3,5-dinitrobenzoyl phenylglycine, covalently bonded to 5 µm aminopropyl silica. Phenylglycine columns are available in both L- and D- configurations. This CSP resolves a wide variety of compounds containing π-basic groups, including aryl-substituted cyclic sulfoxides, bi-ß-naphthol and its analogs, α-indanol and α-tetralol analogs, and aryl-substituted hydantoins.

Particle Size	Column Dimensions	D- Catalog #	L- Catalog #
5 µm	15 cm x 4.6 mm	1-731017-300	1-731018-300
	25 cm x 4.6 mm	1-731021-300	1-731024-300
	25 cm x 10 mm	1-731221-300	1-731224-300
	25 cm x 21.1 mm	1-731331-300	1-731334-300

Phenylgycline (opposite page)



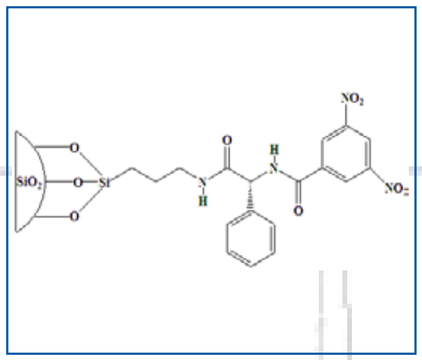
Pirkle 1-J

Analytical & Semi-Preparative Columns

The Pirkle 1-J column is the latest in a series of CSPs from the research laboratories of Professor Pirkle. This new CSP contains an unusual ß-lactam structure which significantly alters its molecular recognition properties. The Pirkle 1-J is useful for the direct separation of underivatized ß-blocker enantiomers.

It can also be used for the separation of the enantiomers of arylpropionic acid NSAIDs, as well as other drugs.

Particle Size	Column Dimensions	(3R, 4S) Catalog #	(3S, 4R) Catalog #
5 µm	15 cm x 4.6 mm	1-731013-300	1-731014-300
	25 cm x 4.6 mm	1-731044-300	1-731045-300
	25 cm x 10 mm	1-731244-300	1-731245-300
	25 cm x 21.1 mm	1-731344-300	1-731345-300



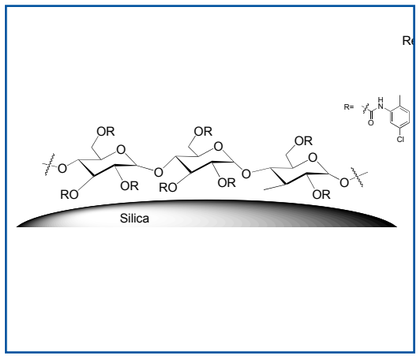
ß-Gem 1

Analytical & Semi-Preparative Columns

ß-Gem1 is a π-acceptor chiral stationary phase and is prepared by covalently bonding N-3, 5-dinitrobenzo-yl-3-amino- 3-phenyl-2-(1,1-dimethylethyl)-propanoate, to 5 µm silica through an ester linkage.

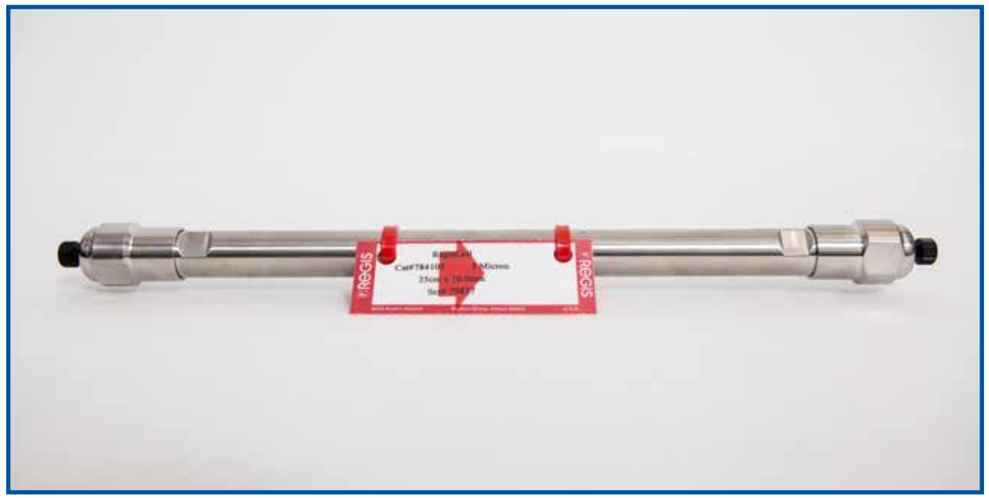
In many cases, this chiral phase considerably outperforms its widely used analog, phenylglycine. It can separate anilide derivatives of chiral carboxylic acids, including non-steroidal anti-inflammatory agents.

Particle Size	Column Dimensions	(S,S) Catalog #	(R,R) Catalog #
5 µm	15 cm x 4.6 mm	1-731020-300	1-731019-300
	25 cm x 4.6 mm	1-731029-300	1-731043-300
	25 cm x 10 mm	1-731229-300	1-731243-300



Particle Size	Column Dimensions	Catalog
3 µm	10 cm x 4.6 mm	1-784502-300
	15 cm x 4.6 mm	1-784503-300
	25 cm x 4.6 mm	1-784504-300
	15 cm x 3 mm	1-784505-300
	10 cm x 3 mm	1-784506-300
	5 cm x 3 mm	1-784501-300
	2 cm x 3mm	1-784508-300
	5 cm x 2.1 mm	1-784509-300
	10 cm x 2.1 mm	1-784510-300
	15 cm x 2.1 mm	1-784511-300
5 µm	5 cm x 4.6 mm	1-784101-300
	10 cm x 4.6 mm	1-784102-300
	15 cm x 4.6 mm	1-784103-300
	25 cm x 4.6 mm	1-784104-300
	25 cm x 10 mm	1-784105-300
	25 cm x 21.1 mm	1-784106-300
	25 cm x 30 mm	1-784107-300
	25 cm x 50 mm	1-784108-300
	15 cm x 30 mm	1-784109-300
	15 cm x 2.1 mm	1-784122-300
10 µm	5 cm x 4.6 mm	1-784201-300
	10 cm x 4.6 mm	1-784202-300
	15 cm x 4.6 mm	1-784203-300
	25 cm x 4.6 mm	1-784204-300
	25 cm x 10 mm	1-784205-300
	25 cm x 21.1 mm	1-784206-300
	25 cm x 30 mm	1-784207-300
	25 cm x 50 mm	1-784208-300
	15 cm x 2.1 mm	1-784221-300
20 µm	25 cm x 4.6 mm	1-784304-300

Bulk packaging is available
for 5 µm,10 µm, and 20 µm material

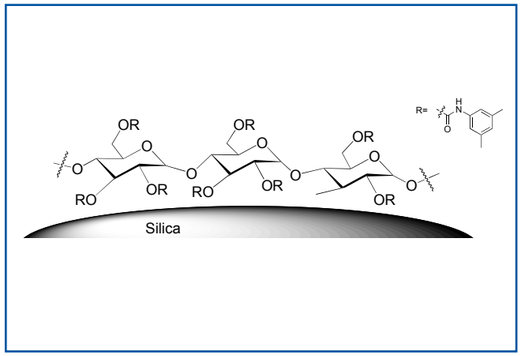


RegisCell™

tris-(5-chloro-2-methylphenyl) carbamoyl cellulose

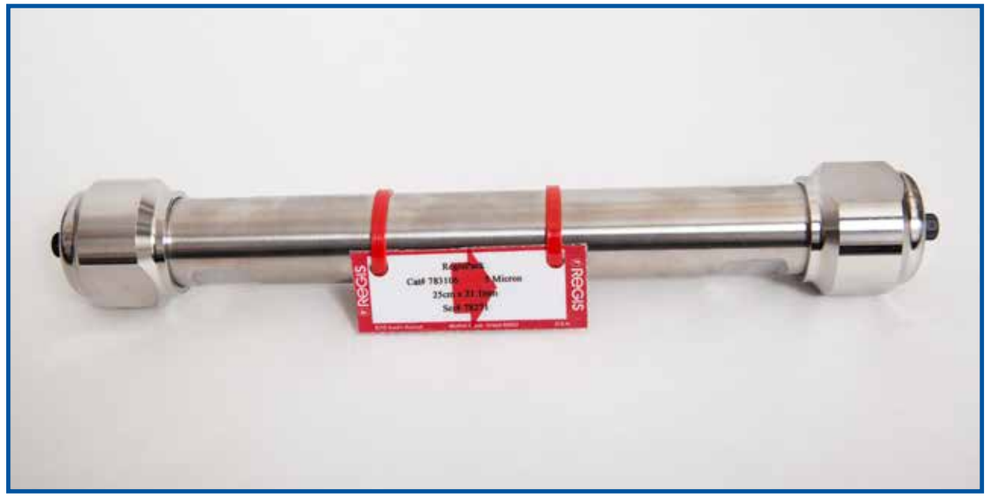
RegisCell™ polysaccharide coated chiral columns are made using a unique production process of coating the proven chiral selector-tris-(3,5-dimethylphenyl) carbamoyl cellulose on high purity silica gel. RegisCell™ columns are available in 5, 10, and 20 micron particle sizes enabling easy scale up from analytical to preparative using HPLC or SFC conditions. Bulk material is available upon request.

RegisCell® and RegisPack® are coated phases with similar selectivities to the CHIRALPAK® AD and CHIRALCEL® OD respectively



PARTICLE SIZE	COLUMN DIMENSIONS	CATALOG #
3.5 µm	5 cm x 4.6 mm	1-783507-300
	10 cm x 4.6 mm	1-783502-300
	15 cm x 4.6 mm	1-783503-300
	25 cm x 4.6 mm	1-783504-300
	15 cm x 3 mm	1-783505-300
	10 cm x 3 mm	1-783506-300
	5 cm x 3 mm	1-783501-300
	2 cm x 3 mm	1-783508-300
	5 cm x 2.1 mm	1-783509-300
	10 cm x 2.1 mm	1-783510-300
	15 cm x 2.1 mm	1-783511-300
5 µm	5 cm x 4.6 mm	1-783101-300
	10 cm x 4.6 mm	1-783102-300
	15 cm x 4.6 mm	1-783103-300
	25 cm x 4.6 mm	1-783104-300
	25 cm x 10 mm	1-783105-300
	25 cm x 21.1 mm	1-783106-300
	25 cm x 30 mm	1-783107-300
	25 cm x 50 mm	1-783108-300
	15 cm x 30 mm	1-783109-300
	15 cm x 2.1 mm	1-783122-300
10 µm	5 cm x 4.6 mm	1-783201-300
	10 cm x 4.6 mm	1-783202-300
	15 cm x 4.6 mm	1-783203-300
	25 cm x 4.6 mm	1-783204-300
	25 cm x 10 mm	1-783205-300
	25 cm x 21.1 mm	1-783206-300
	25 cm x 30 mm	1-783207-300
	25 cm x 50 mm	1-783208-300
	15 cm x 2.1 mm	1-783221-300
20 µm	25 cm x 4.6 mm	1-783304-300

BULK PACKAGING IS AVAILABLE
FOR 5 µM,10 µM, AND 20 µM MATERIAL

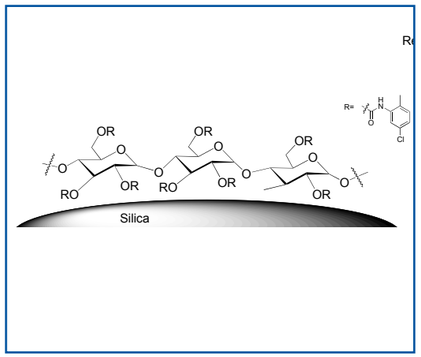


REGISPACK™

tris-(5-chloro-2-methylphenyl) carbamoyl amylose

- Key chiral columns with the most general applicability for the separation of enantiomers
- High pressure limit (450 bar) delivers faster run times and equilibration
- RegisPack® and RegisCell® are coated phases with similar selectivities to the CHIRALPAK® AD and CHIRALCEL® OD respectively
- Ability to run under normal phase, reverse phase and SFC conditions*
- RegisPack® and RegisCell® bring new recognition abilities to Regis' chiral product range

* Consult the Regis care and use guide for full details on solvent recommendation



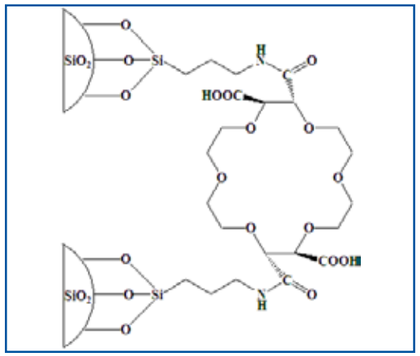
PARTICLE SIZE	COLUMN DIMENSIONS	CATALOG
3 µm	5 cm x 4.6 mm	1-793507-300
	10 cm x 4.6 mm	1-793502-300
	15 cm x 4.6 mm	1-793503-300
	25 cm x 4.6 mm	1-793504-300
	15 cm x 3 mm	1-793505-300
	10 cm x 3 mm	1-793506-300
	5 cm x 3 mm	1-793501-300
	2 cm x 3 mm	1-793508-300
	5 cm x 2.1 mm	1-793509-300
	10 cm x 2.1 mm	1-793510-300
	15 cm x 2.1 mm	1-793511-300
5 µm	5 cm x 4.6 mm	1-793101-300
	10 cm x 4.6 mm	1-793102-300
	15 cm x 4.6 mm	1-793103-300
	25 cm x 4.6 mm	1-793104-300
	25 cm x 10 mm	1-793105-300
	25 cm x 21.1 mm	1-793106-300
	25 cm x 30 mm	1-793107-300
	25 cm x 50 mm	1-793108-300
10 µm	5 cm x 4.6 mm	1-793201-300
	10 cm x 4.6 mm	1-793202-300
	15 cm x 4.6 mm	1-793203-300
	25 cm x 4.6 mm	1-793204-300
	25 cm x 10 mm	1-793205-300
	25 cm x 21.1 mm	1-793206-300
	25 cm x 30 mm	1-793207-300
	25 cm x 50 mm	1-793208-300
20 µm	25 cm x 4.6 mm	1-793304-300

BULK PACKAGING IS AVAILABLE FOR 5 µM,10 µM, AND 20 µM MATERIAL

REGISPACK CLA-1™

tris-(5-chloro-2-methylphenyl) carbamoyl amylose

- Coated chlorinated amylose phase
- Ability to complement other Regis chiral columns for specific separations
- Similar selectivity to the CHIRALPAK® AY
- Applicable for HPLC and SFC methods



ChiroSil® Crown-Ether CSPs

The Choice for Amino Acids and Compounds with Primary Amines

The ChiroSil® RCA(+) and SCA(-) chiral stationary phases were developed by RStech Corporation in Daejeon, South Korea. This phase is prepared by a covalent trifunctional bonding of (+) or (-) -(18-Crown-6)-tetracarboxylic acid as the chiral selector. The covalent bonding ensures univesal solvent compatibility and allows operation under ambient conditions.

Highly Durable

- Exhibits excellent durability due to covalent bonding
- Most robust crown ether column for HPLC

Ability to Invert Elution Order

- Columns available in both enantiomeric forms, which allows for the inversion of peak elution order

Particle Size	Column Dimensions	RCA (+) Catalog #	SCA (-) Catalog #
5 µm	10 cm x 3 mm*	1-799001-300	1-799100-300
	15 cm x 4.6 mm	1-799001-300	1-799101-300
	25 cm x 4.6 mm	1-799002-300	1-799102-300
	15 cm x 2.1 mm	1-799003-300	1-799103-300
	25 cm x 10 mm	1-799006-300	N/A
	25 cm x 21.1 mm	1-799005-300	1-799105-300
	10 cm x 3 mm	N/A	1-799107-300
10 µm	25 cm x 21.1 mm	1-799004-300	1-799104-300
	15 cm x 30 mm	1-799018-300	1-799118-300
	15 cm x 50 mm	1-799019-300	1-799119-300

Bulk packaging is available for 10 µm material

* Guard Column

More on Polysaccharide-Coated CSPs

The new polysaccharide coated chiral columns provide enantiomeric separations of a wide range of racemate classes at an affordable price.

Excellent Selectivity

Wide Range of Separations

Superior Resolution

Data show excellent theoretical plate count and resolution in the separation of a wide range of
compounds.

High Pressure Limit

The columns' high pressure limit (450 bar) delivers faster method development and run times without sacrificing resolution or performance.

Fast Run Times and Optimization

Leverage the columns' high pressure limit for equilibration times when switching from one compatible mobile phase to another.

Same Cost for SFC and HPLC columns

No need to buy two columns. RegisCell™, RegisPack™, and RegisPack CLA-1™ columns are packed and tested at high pressures for use in both SFC and HPLC mode.

HPLC

REGIS
IAM P.C. DD2
REGIS
IAM P.C
REGIS
TECHNOLOGIES INC
IAM P.C
REGIS
IAM.PC.DD.2
3cm X 4.6mm 10 MICRON 300 ANG
CAT# 774010 SER# 49153
8210 Austin Avenue
Morton Grove, Illinois 60053
U.S.A.
REGIS

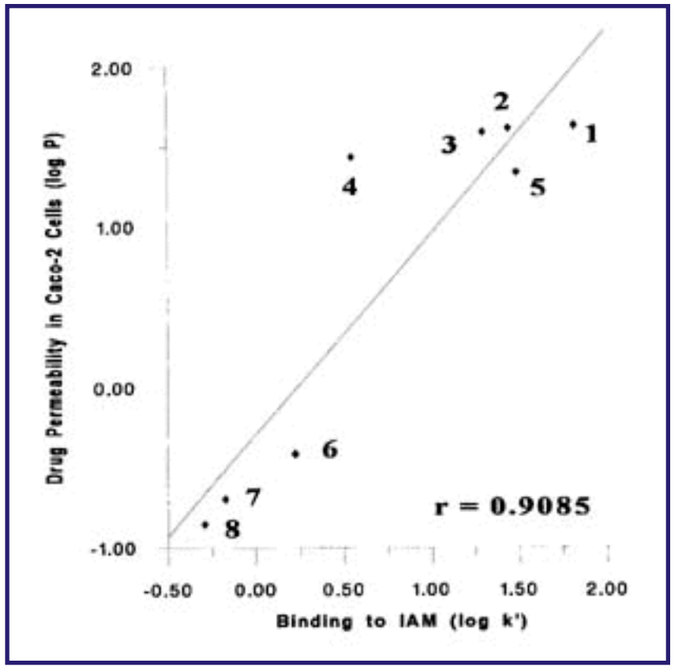
Immobilized Artificial Membrane (IAM) Chromatography

IAM Drug Discovery HPLC Column is an ideal tool for high throughput prediction of drug membrane permeability. The IAM surface is formed by covalently bonding the membrane-forming phospholipids to silica. The results from this column correlate well to traditional in-vitro methods such as intestinal tissue and Caco-2 Cells, yet are faster and cheaper to achieve.

Phosphatidylcholine (PC) is the major phospholipid found in cell membranes. IAM chromatography phases prepared from PC analogs closely mimic the surface of a biological cell membrane. Consequently, IAM phases display a high affinity for membrane proteins and are useful in membrane protein purification and in the study of drug-membrane interactions.

The traditional means of predicting permeability includes use of Caco-2 cell line cultures, intestinal tissue or liposome assays. These are laborious and costly to perform. Data obtained from the IAM Columns correlates well to data obtained from traditional assays.

Other phases such as ODS silica, for example, retains analytes solely on the basis of hydrophobicity. IAM more closely mimics the interaction of analytes with biological membranes, where a combination of hydrophobic, ion pairing and hydrogen bonding interactions are possible. This combination of interactions measured by the IAM column is known as phospholipophilicity. These advances have led to the development of several new IAM phases used for predicting drug membrane permeability-the IAM.PC.DD2 and the IAM Fast-screen Mini Column.

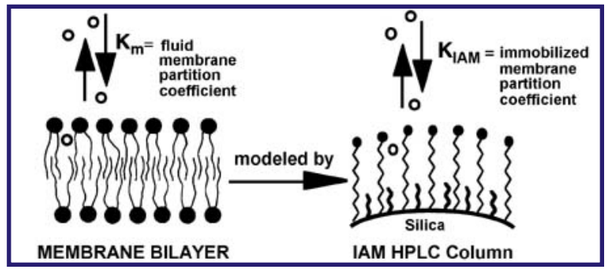


Predicting Drug Membrane Permeability

Immobilized Artificial Membrane (IAM) chromatography has recently gained acceptance among drug discovery chemists for estimating the membrane of small molecule drugs. The figure to the right illustrates that the interaction between membrane bilayer and drug can be modeled by the IAM column/drug system. KIAM, the equilibrium constant describing the relative concentrations of drug in the membrane and in the external fluid, is analogous to the k' IAM.

This IAM technique provides superior correlation with experimentally determined drug permeability when compared to other chromatographic methods. IAM more closely mimics the interaction of analytes with biological membranes, where a combination of hydrophobic, ion pairing, and hydrogen bonding interactions are possible. The combination of interactions measured by the IAM column is known as phospholipophilicity.

These advantages have led to the development of several new IAM phases used by predicting membrane permeability.



The IAM.PC.DD2 packing offers the following advantages:

More Hydrophobic

The IAM.PC.DD2 offers more hydrophobicity, thus giving longer retentions to compounds not well retained on the IAM.PC.DD packing. Retentions are typically double on the IAM.PC.DD2 column than on the DD column and exhibit excellent correlation for groups of compounds.

Greater Stability

Another distinct advantage of the IAM.PC.DD2 packing is its ability to tolerate mobile phases between pH's 7.0 and 7.5, thus resulting in longer column life under these conditions.

Excellent Correlation to Traditional Methods

The traditional means of predicting membrane permeability include the use of Caco-2 cell line cultures, intestinal tissue, or liposom assays. These methods are laborious and costly to perform.

Intestinal Tissue Correlation

Measuring drug permeability in the intestinal tissue, where absorption is occuring, is physiologically more relevant than measuring drug permeability in Caco-2 cells.

Product type	Column Dimensions	Catalog #
Analytical Column	15 cm x 3 mm	1-774003-300
	3 cm x 4.6 mm	1-774010-300
	10 cm x 4.6 mm	1-774011-300
	15 cm x 4.6 mm	1-774014-300
Guard Kit	1 cm x 3 mm	1-774012-300
Guard Replace	1 cm x 3 mm	1-774013-300
Bulk Packaging is Available		

IAM Membrane Protein Purification

The IAM.PC phase, developed by Dr. Charles Pidgeon of Purdue University, was the first in a line of IAM phases to be manufactured by Regis. Use of this phase has simplified the inherent difficulties of protein isolation and purification, allowing for rapid purification of membrane proteins while maintaining biological activity. The IAM.PC phase is an important tool for the pharmaceutical industry and academia alike.

The first IAM stationary phase was based on the prevalent membrane lipid, phosphatidylcholine (PC), and consists of monolayers of amphiphilic phospholipids covalently bonded to aminopropyl silica particles through a terminal amide linkage. As a result, the bulky phosphatidylcholine groups shield many of the amine binding sites on the silica surface, preventing amine interaction with the protein molecules.

The membrane nature of the IAM phase imparts surface characteristics which are useful in the chromatography of membrane proteins. These include: high protein loading, increased protein recovery, recovery of functional activity, and selectivity for membrane proteins.

Large membrane proteins can interact with any combination of polar headgroup, hydrophobic chain, or inner amine groups. The subsurface has been shown to interact with certain solutes, and may or may not contribute to the separation of a given biomolecule. The residual amines can be left unaltered on the subsurface or deactivated through an endcapping procedure, which results in increased stability of the bonded phase. The methyl glycolate endcapping, for example, converts residual amines to neutral amides and introduces a hydroxyl group (IAM.PC.MG).

Numerous applications have been developed using IAM.PC columns:

- Purification of Cytochrome P450
- Isolation of membrane proteins
- Prediction of solute transport across human skin
- Prediction of amino acid transport across the blood-brain barrier
- Binding of solutes to liposome membranes
- Immobilization of Trypsin and α-chymotrypsin for the determination of their inhibitor and substrate activity

Product	Product type	Column Dimensions	Catalog #
IAM.PC	Analytical Column	15 cm x 4.6 mm	1-770001-300
		3 cm x 4.6 mm	1-770007-300
	Guard Kit	1 cm x 3 mm	1-771001-300
	Guard Replace	1 cm x 3 mm	1-774001-300
IAM.PC.MG	Analytical Column	15 cm x 4.6 mm	1-772001-300
		3 cm x 4.6 mm	1-772007-300
	Guard Kit	1 cm x 3 mm	1-773001-300
Bulk Packaging is Available			

The IAM Fast-Screen Mini Column

Packed with the Ester PC Ligand phase, IAM Fast-Screen Mini columns are a rapid and economically viable screening method for the high throughput estimation of drug permeability. Their benefits include excellent reproducibility, short analysis time and low cost. This can be of great use in characterizing large libraries of compounds.

The IAM.PC Fast-Screen Mini Column, 1 cm in length by 3.0 mm in internal diameter, and was specifically designed by Regis for rapid estimation of drug permeability in high-throughput screening programs. When connected to an HPLC system with an autosampler, a single column can be used in the analysis of hundreds of samples per day with highly reproducible results.

The 1 cm Fast-Screen Mini Column is offered not as a separation tool, but rather as a tool for characterizing the chromatographic retention factor (k') of individual analytes. The measured k' of analytes on this column can be used to estimate a value for drug permeability.

Product type	Quantity	Catalog #
Column Kit	N/A	1-775014-300
Replacement Pack	6	1-775015-300
	12	1-775016-300

The IAM Fast-Screen Mini Column packing offers the following advantages:

Excellent Correlation to Traditional Methods

The traditional means of predicting permeability includes use of Caco-2 cell line cultures, intestinal tissue or liposome assays. These are laborious and costly to perform. Data obtained from the IAM Fast-Screen Mini Column correlate well to data obtained from traditional assays.

Rapid Indication of Drug Absorption

IAM Chromatography is a more rapid alternative to other methods. In a recent study completed by Regis, k'IAMs of 12 compounds were compared with absorption data obtained in situ using rat intestines. Retention times for the compounds tested were between 20 and 190 seconds, while retention factors correlated well to the intestinal absorption data.

High Sample Throughput

IAM Chromatography is of increasing importance in combinatorial chemistry, where it is used to provide an initial estimate of a drug candidates' membranes permeability. Hundreds of samples can be injected into a single Fast-Screen Mini Column using an automated HPLC system. Recently a group of 12 test analytes was evalutaed in 10 runs over the course of eight hours. Total run time for the 12 test analytes was only 42 minutes.

Highly Reproducible Results

The measured values for k'IAM show excellent reproducibility, both from run to run and from day to day.

Durability

IAM Fast-Screen Mini Columns are extremely durable. Correlation factors,r, for the original k', and k' after 5000 column volumes were identical.

Cost Effectiveness

Because the IAM Fast-Screen Mini Column is inexpensive, has a very short analysis time, and provides drug permeability estimates for hundreds of drug candidates in a fraction of time of conventional methods, the IAM Fast-Screen Mini Column becomes the economical alternative for high throughput screening.

Ability to Establish Permeability Zones for High Throughput Screening

Permeability zones can be determined for different analytes when performing large-scale drug absorption screening. Thus, rapid IAM analyses can characterize a drug as having low, medium, or high membrane permeability.

Restricted Access Media (RAM) Direct Injection

A Tool for the Separation of Small Molecules in the Presence of Large Biomolecules

HPLC analysis of small molecules contained within a protein matrix can be a difficult and time consuming task. The analysis often involves multi-step pretreatment procedures including centrifugation, extraction and filtration. RAM Direct Injection allows for the chromatographic resolution of small molecules in the presence of much larger analytes without extensive sample pretreatment. RAM Direct Injection HPLC columns eliminate prior sample clean-up making it possible to directly inject a variety of complex sample matrices for the separation and detection of drugs, drug metabolites, peptides, and other analytes.

RAM Direct Injection Phases

RAM phases employ a porous silica support that consists of an external, directly accessible surface and internal pores accessible only to molecules with an approximate molecular weight of less than 12,000 Daltons. Most conventional HPLC phases have a homogenous stationary phase on both silica surfaces. In contrast, the RAM phases are prepared by unique bonding processes that result in distinct inner and outer surfaces.

A dual surface configuration is especially important because the pores provide the majority of the silica's surface area. This dual-phase system allows for the separation of analytes through a combination of size exclusion and conventional phase partitioning. The outer surface employs both size exclusion and hydrophilic interaction to prevent large biomolecules from accessing the inner layer. As a result, these compounds elute from the column at the void volume. Small molecules penetrate through to the inner surface where they are retained and separated by the underlying hydrophobic support.

RAM Direct Injection offers the following advantages:

Eliminates multiple sample pretreatment steps

The use of RAM Direct Injection HPLC columns eliminates the precipitation, centrifugation, solvent evaporation, and residue dissolution steps (figure 1) of typical procedures. Simply filter the sample and inject directly onto the column.

Useful with a variety of sample matrices

The RAM Direct Injection HPLC columns have demonstrated efficacy in the analysis of drugs, drug metabolites, peptides, and other analytes in matrices such as plasma, serum, whole blood, urine, plant and tissue extract, food and beverage, and environmental samples.

Compatible with automated sample processing

Simplified sample preparation and use of HPLC columns allows customers to employ automated systems.

Reduces potentially dangerous sample handling

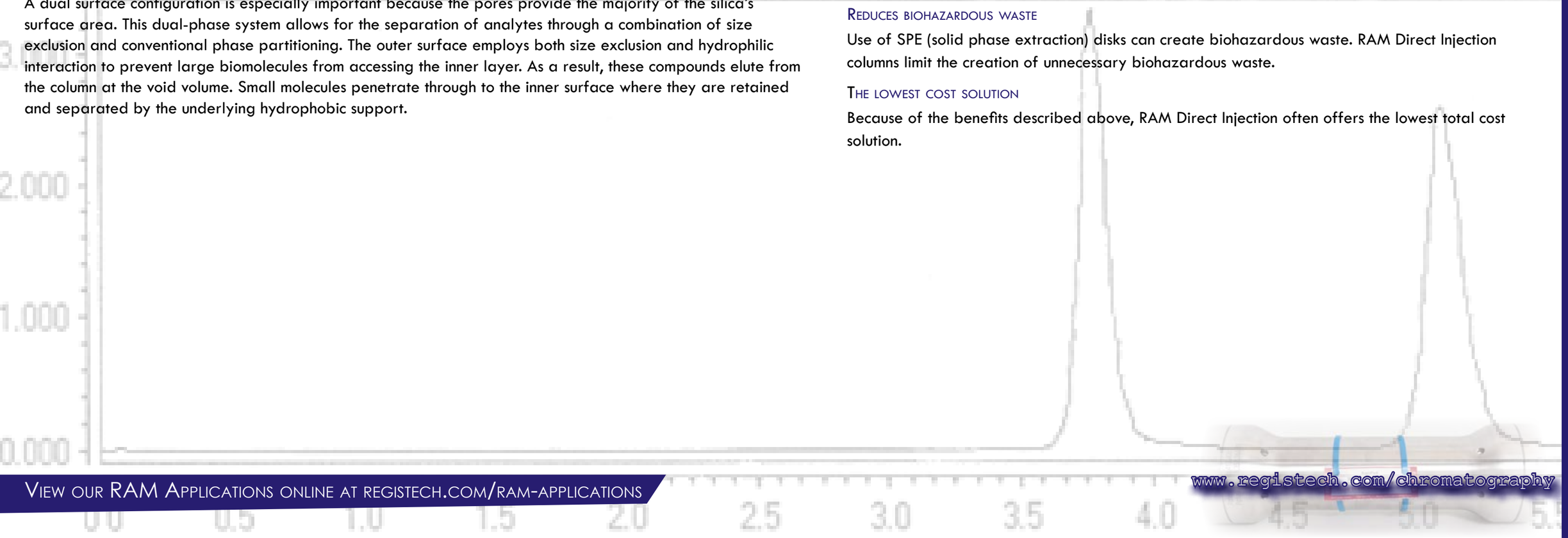
With direct injection, sample handling is significantly reduced; therefore, potentially dangerous samples such as plasma, serum, urine and environmental samples do not pose as significant a threat to the worker.

Reduces biohazardous waste

Use of SPE (solid phase extraction) disks can create biohazardous waste. RAM Direct Injection columns limit the creation of unnecessary biohazardous waste.

The lowest cost solution

Because of the benefits described above, RAM Direct Injection often offers the lowest total cost solution.



Internal Surface Reversed Phase (ISRP)

Developed by Dr. Thomas Pinkerton, this material was created specifically for the direct analysis of drugs in serum without extensive sample preparation. The result was a new phase that allows for chromatographic separations without interference by protein adsorption.

GFF II

Continuing product improvement efforts resulted in the development of the ISRP GFF II, a second generation phase with an improved bonding process—bonding the GFF peptide to the silica surface through a monofunctional glycidoxypropyl linkage rather than the original trifunctional linkage. This resulted in the following improvements:

- Increased sample retention
- Higher column efficiency
- Greater batch-to-batch reproducibility

ISRP SELECTIVITY

Many variables can affect the selectivity of the ISRP phase, including:

Mobile Phase Composition:

The nature of ISRP analytes requires that mobile phases consist of a buffer with varying degrees of modification. Modifiers can include acetonitrile, methanol, isopropanol and tetrahydrofuran. Caution: too much modifier can result in matrix precipitation.

pH:

The pH of the mobile phase can be controlled to avoid protein denaturing and to enhance selectivity. The pH range of the column is between 2.5 and 7.5; however, within the optimal pH range of 6.0 to 7.5, both the proteins and the glycine outer surface take on a negative charge. As a result, negatively charged proteins are repulsed by the outer phase and pass quickly through the column.

Temperature:

Separations can also be optimized by varying column temperature. Lower temperatures have been shown to result in increased retention and selectivity.

Product	Product type	Column Dimensions	Catalog #
Pinkerton, ISRP GFF II	Analytical Column	5 cm x 2.1 mm	1-731469-300
		5 cm x 4.6 mm	1-731470-300
		15 cm x 4.6 mm	1-731471-300
		25 cm x 4.6 mm	1-731472-300
	Guard Kit	1 cm x 3 mm	1-731475-300
	Guard Replace	N/A	1-731474-300

RAM: SPS (opposite page)

Semi-Permeable Surface (SPS)

In an effort to extend the applicability of the RAM Direct Injection columns, Regis, in conjunction with Dr. Fred Regnier and Dr. Carla Desilets at Purdue University, developed the Semi-Permeable Surface (SPS) phases.

SPS STRUCTURE

Like the ISRP phase, the SPS phases consist of both hydrophilic outer and hydrophobic inner surfaces. The distinct difference is that the inner and outer surfaces of the SPS are bonded separately, allowing each to be varied independently. The SPS structure includes a hydrophobic inner phase such as ODS, and a hydrophilic outer phase of polyethylene glycol. The outer phase provides size exclusion and hydrophilic shielding, which repels large biomolecules. The various inner phases allow for separation of small analytes.

SPS COLUMN ADVANTAGES

The SPS offers the following advantages:

- Increased durability
- Increased selectivity
- Allows use of buffered, normal-phase, and reversed-phase systems

SPS SELECTIVITY

The primary advantage of SPS over ISRP GFF II is that the inner surface of SPS may be varied independently of the outer, resulting in a wider scope of analysis opportunities. Available inner phases include the following:

- Octyl (C8)
- ODS (C18)
- Phenyl

The retention mechanism of these SPS phases involves hydrogen bonding by the outer phase and hydrophobic interaction by the inner phase. Polar solutes interact primarily with the outer phase and show little discrimination among the various inner phases. Conversely, the nonpolar solutes interact primarily with the inner phase.

The SPS phases allow use of buffered, normal phase, and reversed-phase eluents. The actual composition is limited only by the pH and organic modifier parameters dictated by the proteins contained within the sample.

Product type	Column Dimensions	Octyl Catalog #	ODS Catalog #	Phenyl Catalog #
Analytical Column	5 cm x 2.1 mm	1-785308-300	1-785318-300	N/A
	5 cm x 4.6 mm	1-785008-300	1-785018-300	N/A
	15 cm x 4.6 mm	1-785108-300	1-785118-300	1-785107-300
	25 cm x 4.6 mm	1-785208-300	1-785218-300	1-785207-300
Guard Kit	1 cm x 3 mm	1-785408-300	1-785418-300	1-785407-300
Guard Replace	N/A	1-785508-300	1-785518-300	1-785507-300
Cartridge Kit	1 cm 10 mm	1-785608-300	1-785618-300	N/A
Replace	1 cm x 10 mm	1-785708-300	1-785718-300	N/A

Supercritical Fluid Chromatography

Separation Services: SFC

RegisSEP™ Chiral Se

Supercritical Fluid Chromatography

Regis Technologies has added Supercritical Fluid Chromatography (SFC) to its GMP-approved chiral separations services, offering pharmaceutical and other industries an expanded separation service that uses a superior technique with cost and time efficiencies.

Superior Method

Supercritical Fluid Chromatography (SFC) is now gaining increased acceptance the method-of-choice for the analysis and purification chiral separations. Although a well-established method for over 20 years, renewed interest emerged with the recent introduction of high throughput SFC systems required for pharmaceutical applications.

With the method's ability to accommodate flexible solvent conditions, SFC provides a superior chiral purification method compared to traditional HPLC.

Cost Efficient

Several factors combine to reduce the cost of SFC separations without sacrificing purity, including:

- Faster run times
- Flexible solvent conditions
- Lower solvent use as SFC typically utilizes carbon dioxide as the mobile phase
- Reduced waste for disposal
- Less ancillary equipment required

Complete SFC Service

Regis Technologies now offers RegisSEP™ SFC Separations Services. This valuable addition to our chromatographic separations group delivers benefits that no other separation method can provide. Turn to our expert staff to help solve your separations problems. Experience excellence in project management on all you separations projects. Expand your capabilities overnight with our GMP compliant service that can tackle projects for the scale you need from milligram- to kilo-scale.

RegisSEP™ GMP SFC Separation Services

Leverage the Added Value from Regis Technologies

Reliability and Experience

Regis Technologies has been serving the pharmaceutical, biotechnology, and related industries for over 50 years. As a leader in separations services, Regis has been involved in chiral and achiral separations for over 25 years and supplies specialty chiral columns and other chromatography products. The company's decades of experience are unmatched in the field.

GMP Compliant Organization

Regis Technology has been a fully compliant GMP organization since 1993. We manufacture APIs under GMP and are regularly inspected by the FDA. In this manner, we become an FDA approved extension of your manufacturing facility.

Production Capabilities

Regis' Production department works hand-in-hand with the separations group to provide GMP productions support for the many separation projects included in your synthesis. Regis' Production department is headed by a 23-year industry veteran. Production equipment ranges from small glassware to kilogram suites to reactors ranging from 25 to 500 gallons. Regis production also utilizes large glass gravity chromatography columns with a total capacity of up to 175 kg of silica.

Bulk Phases

Cut lead time and expense. As a manufacturer of Chiral Stationary Phases, we inventory our bulk material so it is readily available for your separation projects.

High-Throughput SFC Systems

Regis Technologies uses Thar SFC Method Station with Regis Technologies columns. Regis chose the Thar system for its quality, and because of their ease of validation.

Supportive Departmental Services

Your project will benefit from Regis' extensive organization including QA, Analytical Method Development, QC, Stability, and Project Management. These departments all contribute according to the needs of the project and of the customer.

www.registech.com/chromatography

Use the SFC Chiral Screen Submission Sheet on page 10 to start your project today!

RegisSEP™ GMP SFC Separation Services

Screening & Assessment Process

Execute a CDA (1 day)

Perform screening of the compound

Free screening using Regis phases

- Fee for screening using other phases
- Report of findings is transferred to the customer

Critical Data Assessment

Regis performs a critical assessment of the data and presents it to the customer to determine a plan of action for the compound.

Fast Project Execution

Our experience and proven processes translate into efficient project executions, thereby reducing your time to market.

Regis' formal screening and critical assessment process is quick and easy, and ensures agreement for best results. For the initial screen, our experienced chromatographers use the wealth of their experience to select the best column performers of more than 50 available for your separations. This initial phase is most critical, enabling the project to move forward.

Regis continues to offer confidential free chiral screening services using its proprietary phases on both LC and SFC units—your first and only stop in determining which stationary phase meets your compound's needs.

REGIS TECHNOLOGIES, INC.

8210 Austin Ave.
Morton Grove, IL 60053, USA
Phone: 847-967-6000
Fax: 847-967-1214

HPLC/SFC Chiral Screen Submission Sheet

Contact Information:

Submission Date: _____
Primary Contact: _____
Alternate Contact: _____
Company: _____
Address: _____
City: _____
State: _____ Zip Code: _____
Country: _____
Phone: _____ Fax: _____
Email: _____

Compound Structure/Name
Or attach separately

Name: _____

Do you want this screening sample returned?
Yes ☐ No ☐

Note: All screening samples are destroyed after analysis is complete. No peaks are collected during the screening and any isolation work requires an additional quote.

Separation Requirements:

Analytical HPLC? ☐ SFC? ☐
Preparative SFC? ☐
If yes, projected separation quantity _____
nonGMP ☐ cGMP ☐

Safety and Handling

MSDS Available (*If yes, include a copy with sample*) Yes ☐ No ☐
Hazardous Material: Yes ☐ No ☐
Storage Conditions (*ambient if left blank*): _____
Special Handling Requirements: _____

Properties and Appearance:

Powder ☐ Crystalline ☐ Oil ☐
Color: _____
λ_{max}(nm): _____
Chemical Purity (%AUC): _____

Known Chiral Chromatographic Methods: (***Please include a copy of any chromatograms***)

Column: _____
Manufacturer: _____
Mobile Phase: _____
Flow Rate: _____ Wavelength (nm): _____

v. 3

REGIS TECHNOLOGIES, INC.

8210 Austin Ave.
Morton Grove, IL 60053, USA
Phone: 847-967-6000
Fax: 847-967-1214

Stability

Light:	Stable ☐	Decomposes ☐	Unknown ☐
Moisture:	Stable ☐	Decomposes ☐	Unknown ☐
Temp (> 40°C)	Stable ☐	Decomposes ☐	Unknown ☐

Acids

Acetic Acid (>1%)	Stable ☐	Decomposes ☐	Unknown ☐
Trifluoroacetic Acid (>1%)	Stable ☐	Decomposes ☐	Unknown ☐

Bases

Triethylamine (>1%)	Stable ☐	Decomposes ☐	Unknown ☐
Diethylamine (>1%)	Stable ☐	Decomposes ☐	Unknown ☐

Solubility

Water	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Methanol	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Ethanol	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
2-Propanol	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Hexanes	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Ethyl Acetate	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
CH_2Cl_2	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Chloroform	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐
Acetonitrile	Soluble ☐	Slightly ☐	Decomposes ☐	Unknown ☐

Other: _____

COMMENTS:

Instructions:

Please send or email this completed form along with your sample(s) to:

teds@registech.com

Ted Szczerba
8210 Austin Ave.
Morton Grove, IL 60053-051

We would like to have at least 10-20 mg of sample. If you are unable to send us 10 mg, you must include sufficient solubility information. If the compound you are sending is not commercially available, please inquire if you need a confidentiality agreement signed before you send us your sample.

v. 3

Click above to download

Scaling up Process

Our GMP compliant service can tackle projects for the scale you need from milligram- to kilo-scale. Regis Technologies formal process enables us to provide you with accurate quotes and yields, and shows the basic steps for how we progress from small-scale analytical to kilogram preparative separations.

Small-Scale Separations	10-100g Separations	Kilogram Separations
Perform a solubility and loading study	Separations available on a GMP or non-GMP basis	Separations available on a GMP or non-GMP basis
Isolate desired enantiomers	Confirm purity by HPLC	Calculate machine time and raw materials
Confirm purity by HPLC	Provide a detailed separations report	Pack or procure the required columns
Provide a detailed separations report	Estimate costs for kilogram scale	Confirm purity by HPLC
Estimate costs 10-100g scale		Provide a detailed separations report

This process enables us to provide you with accurate quotes and yields, and shows the basic steps for how we progress from small-scale analytical to kilogram preparative separations.

www.registech.com/chromatography

GAS CHROMATOGRAPHY

GAS CHROMATOGRAPHY

DERIVATIZATION REAGENTS

SILYLATION REAGENTS

Silylation is the most widely used derivatization procedure for sample analysis by GC. Silylation reagents are popular because they are easy to use and readily form derivatives. In silylation, an active hydrogen is replaced by an alkylsilyl group, such as trimethylsilyl (TMS) or t-butyldimethylsilyl (t-BDMS). Compared to their parent compounds, silyl derivatives are more volatile, less polar, and more thermally stable. As a result, GC separation is improved and detection is enhanced.

Silylation reagents are generally moisture sensitive, requiring them to be sealed under nitrogen to prevent deactivation. The derivatives of TMS reagents are also moisture sensitive. In response to this difficulty, t-BDMS reagents were introduced, which enabled the formation of derivatives 10,000 times more stable to hydrolysis than the TMS ethers. Both TMS and t-BDMS reagents are suitable for a wide variety of compounds, offer excellent thermal stability and can be used in a variety of GC conditions and applications.

Analysis by the popular combination of gas chromatography and mass spectrometry (GS/MS) often requires special sample derivatization. Particularly effective in these applications is MTBSTFA.

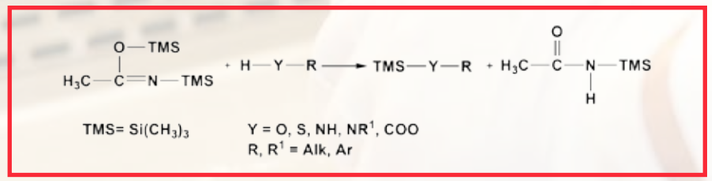
BSA

BSA: Bis(trimethylsilyl)

ACETAMIDE

BSA is a Silylation Reagent for GC Derivatization that forms highly stable TMS derivatives with most organic functional groups under mild reaction conditions.

Physical and Chemical Properties



Use: Silylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 57.9°C (135°F)
MF: $C_8H_{21}NO_2Si_2$
FW: 203.43 g/mol
Specific Gravity (H2O = 1.0): 0.823
Suggested Storage Conditions: Store at 2-8°C under inert gas in a cool, dry place suitable for flammable and corrosive material. Protect from moisture.

BSTFA (opposite page)

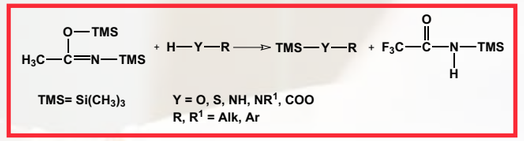
BSTFA +1 or 10% TMCS-Regisil®

Bis(trimethylsilyl)trifluoroacetamide (+% Trimethylchlorosilane

BSTFA is a Silylation Reagent for GC Derivatization that reacts faster and more completely than BSA, due to the trifluoroacetamide leaving group. The high volatility of BSTFA and its byproducts results in non-co-elution of early eluting peaks. Additionally, the highly volatile and stable products result in low detector noise and fouling.

Addition of TMCS to BSTFA catalyzes reactions of hindered functional groups and other difficult functionalities, such as secondary hydroxyls and amines.

Physical and Chemical Properties



Use: Silylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 147°C (296°F)
MF: $C_8H_{18}F_3NOSi_2$ [+ $(CH_3)_2SiCl$]
FW: 257.40 g/mol (BSTFA) [+ 108.66 g/mol (TMCS)]
Specific Gravity (H2O = 1.0): 0.969 (RC-1 & RC-2); 1.028 (RC-2)
Suggested Storage Conditions: Store in tinted glass bottle under nitrogen (RC-1). Store in closed vessel in an area suitable for flammable liquids; store vessel in a cool dry place with adequate ventilation (RC-2 & RC-3).

Product	Size	Catalog #
BSA	10 x 1 gm	1-270501-200
	4 x 5 gm	1-270502-200
	25 gm	1-270503-200
	100 gm	1-270504-200
BSTFA - Regisil® RC-1	10 x 1 gm	1-270111-200
	10 gm	1-270118-200
	4 x 5 gm	1-270112-200
	25 gm	1-270113-200
	100 gm	1-270114-200
	1000 gm	1-270116-200
BSTFA + 1% TMCS - Regisil® RC-2	10 x 1 gm	1-270121-200
	4 x 5 gm	1-270122-200
	25 gm	1-270123-200
	100 gm	1-270124-200
	1000 gm	1-270126-200
BSTFA + 10% TMCS - Regisil® RC-3	10 x 1 gm	1-270131-200
	4 x 5 gm	1-270132-200
	25 gm	1-270133-200
	100 gm	1-270134-200
	1000 gm	1-270135-200

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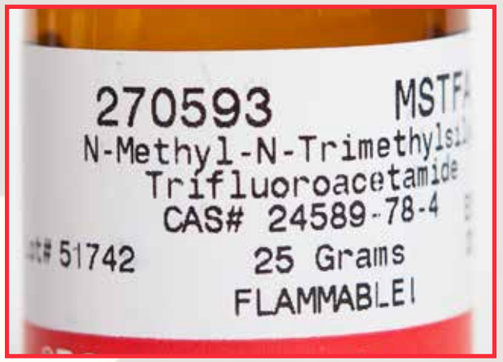
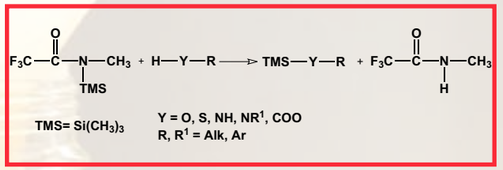
MSTFA



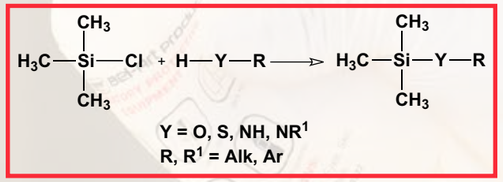


MSTFA: N-Methyltrimethyl-Silyltrifluoroacetamide

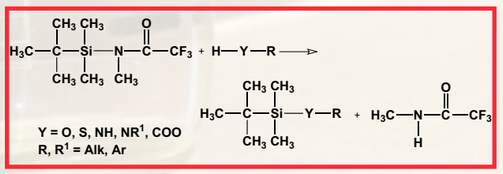
MSTFA is a Silylation Reagent for GC Derivatization and is the most volatile of the TMS-acetamides and useful in the analysis of volatile trace materials. MSTFA is more volatile than BSA or BSTFA, but with similar silylation strength.

Physical and Chemical Properties

Use: Silylation Reagent for GC
Appearance: Clear, colorless to pale yellow liquid
BP: 265-269°F (130-132°C)
MF: $C_6H_{12}F_3NOSi$
FW: 199.25 g/mol
Specific Gravity (H20 = 1.0): 1.075
Suggested Storage Conditions: Cool Place



MTBSTFA



MTBSTFA: N-Methyl-N-(tert-butyldimethylsilyl) Trifluoroacetamide

MTBSTFA is a Silylation Reagent for GC Derivatization that replaces active hydrogens to form t-BDMS derivatives. Derivatization is usually complete upon dissolution with this exceptionally strong, yet mild silylating reagent. MTBSTFA derivatives are 104 times more stable to hydrolysis than their corresponding TMS derivatives and produces easily interpreted mass spectra for GC/MS.

Addition of t-BDMCS catalyzes reactions of hindered alcohols and amines.

Physical and Chemical Properties

Use: Silylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 343°F (172°C)
MF: $C_9H_{18}F_3NOSi$ or ($C_9H_{18}F_3NOSi$ + $C_6H_{15}ClSi$)
FW: 241.33 g/mol (MTBSTFA) or {241.33 g/mol (MTBSTFA) + 150.72 g/mol (t-BDMCS)}
Specific Gravity (H20 = 1.0): 1.023
Suggested Storage Conditions: Cool Place

TMCS (opposite page)

TMCS: Trimethylchlorosilane

TMCS is a Silylation Reagent for GC Derivatization and is used as a catalyst to increase reactivity of other silylation reagents.

Physical and Chemical Properties

Use: Silylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 57.9°C (135°F)
MF: C_3H_9ClSi
FW: 108.64 g/mol
Specific Gravity (H2O = 1.0): 0.856
Suggested Storage Conditions: Store tightly in cool, dry place suitable for halogenated solvents.

Product	Size	Catalog #
MSTFA	10 gm	1-270589-200
	10 x 1 gm	1-270590-200
	1000 gm	1-270592-200
	25 gm	1-270593-200
	100 gm	1-270594-200
MSTFA + 1% TMCS	10 gm	1-270691-200
	10x 1 gm	1-270690-200
	25 gm	1-270693-200
	100 gm	1-270694-200
MTBSTFA	5 x 1 gm	1-270241-200
	2 x 5 gm	1-270242-200
	25 gm	1-270243-200
MTBSTFA + 1% TBDMCS	5 x 1 gm	1-270141-200
	2 x 5 gm	1-270142-200
	25 gm	1-270143-200
	10 x 1 gm	1-270144-200
TMCS	25 gm	1-270601-200
	100 gm	1-270602-200

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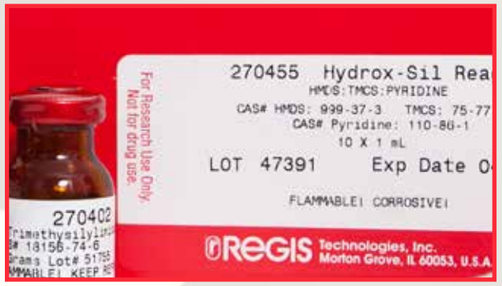
Deriva-Sil



Deriva-Sil

- BSTFA:TMCS:TMSI:Pyridine (3:2:3:10) formulation
- Derivatizes sterically-hindered compounds
- Reacts with carbohydrates,hydroxy- and keto-steroids, fatty acids and some amines and amides
- Derivatizations are complete in minutes

Deriva-Sil Concentrate

- BSTFA:TMCS:TMSI (3:2:3) concentrate formulation
- Used for applications where pyridine is undersirable (i.e. 3-ketosteroids)

Hydrox-Sil

Hydrox-Sil

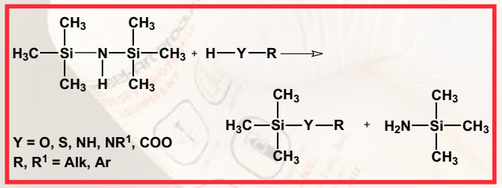
- HMDS:TMCS:Pyridine (2:1:10) formulation for one-step derivatizations
- Fast formation of the TMS derivatives of organic acids, unhindered alcohols and phenols, and some amines

Physical and Chemical Properties

Use: Silylation Reagent for GC
Appearance: Clear to cloudy liquid
Specific Gravity (H2O = 1.0): 0.927
Suggested Storage Conditions: Store tightly in a cool, dry place with adequate ventilation suitable for flammable and corrosive material.

Hydrox-Sil Concentrate

- HMDS:TMCS (2:1) concentrate formulation
- Suited for applications where pyridine in Hydrox-Sil is undesirable



HMDS:
Hexamethyldisilazane

HMDS is a Silylation Reagent for GC Derivatization that is a weak TMS donor, used for silylation of carbohydrates and is used as a mixture with pyridine and trifluoroacetic acid.

Physical and Chemical Properties

Use: Silylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 125°C (256°F)
MF: $C_6H_{19}NSi_2$
FW: 161.4 g/mol
Specific Gravity (H2O = 1.0): 0.77
Suggested Storage Conditions: Cool place with adequate ventilation and area suitable for flammable liquids.

Product	Size	Catalog #
Deriva-Sil	10 x 1 mL	1-270151-200
	25 mL	1-270152-200
Deriva-Sil Concentrate	25 mL	1-270150-200
Hydrox-Sil AQ	10 x 1 mL	1-270451-200
	25 mL	1-270453-200
Hydrox-Sil Reagent	10 x 1 mL	1-270455-200
	25 mL	1-270457-200
Hydrox-Sil Concentrate	25 mL	1-270458-200
HMDS	25 gm	1-270651-200
	100 gm	1-270652-200

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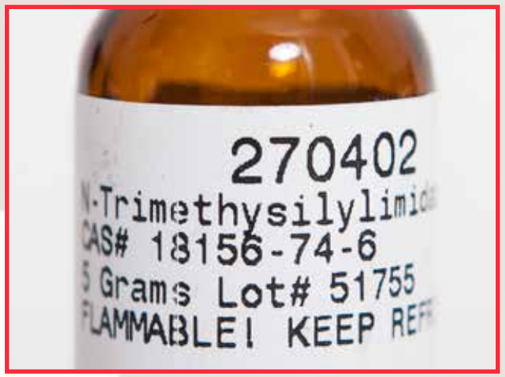
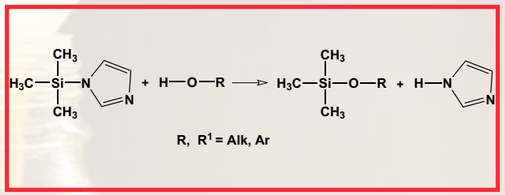
HMDS (opposite page)





TMSI:

Trimethylsilylimidazole

TMSI is a Silylation Reagent for GC Derivatization and is a potent, selective TMS donor that reacts with alcohols and phenols, but not amines or amides. TMSI derivatizes wet sugar samples, hindered hydroxyl groups in steroids, and amino acids in fluorinated acylation reagents. TMSI is used in the preparation of dual perfluoroacyl and TMS derivatives.

Physical and Chemical Properties

Use: Silylation Reagent for GC
Appearance: Clear, colorless to slightly yellow liquid
BP: 93-94°C (199-201°F)
MF: $C_6H_{12}N_2Si$
FW: 140.26 g/mol
Specific Gravity (H2O = 1.0): 0.956
Suggested Storage Conditions: Store under inert gas in a cool, dry place suitable for flammable materials.

Product	Size	Catalog #
TMSI	10 x 1 gm	1-270401-200
	5 gm	1-270402-200
	25 gm	1-270403-200

Product	Size	Catalog #
Acetonitrile	2 x 25 mL	1-270010-200
Pyridine	2 x 25 mL	1-270013-200

Derivatization grade Solvents(opposite page)

DERIVATIZATION GRADE SOLVENTS

GC Chiral analysis of enantiomeric compounds on nonracemic or achiral stationary phases requires the use of enantiopure derivatization reagents. These reagents generally target one specific functional group to produce diastereomers of each of the enantiomeric analytes. From the resulting chromatograms, calculations are conducted to determine the enantiomeric concentration of the analyte.

Acetonitrile

A high purity reagent packaged under nitrogen and sealed with Teflon®-coated septa. This allows for easy access to sample without exposure to moisture and oxygen.

Pyridine: Azabenzene

A high purity reagent packaged under nitrogen and sealed with Teflon®-coated septa. This allows for easy access to sample without exposure to moisture and oxygen.

Physical and Chemical Properties

Use: Analytical Solvent
Appearance: Clear, colorless to yellow liquid
BP: 115.3°C (239°F)
MF: C_5H_5N
FW: 79.10 g/mol
Specific Gravity (H2O = 1.0): 0.978
Suggested Storage Conditions: Store under inert gas in a cool, dry place suitable for flammable materials.

ALKYLATION REAGENTS

As with other derivatization reagents, alkylation reagents reduce molecular polarity by replacing active hydrogens with an alkyl group. These reagents are used to modify compounds having acidic hydrogens, such as carboxylic acids and phenols. Alkylation reagents can be used alone to form esters, ethers and amides or they can be used in conjunction with acylation or silylation reagents. A two-step approach is commonly used in the derivatization of amino acids, where multiple functional groups on these compounds may necessitate protection during derivatization.

Esterification, the reaction of an acid with an alcohol in the presence of a catalyst to form an ester, is the most popular method of alkylation, due to the availability of reagents and ease of use. Alkylation reagents are available in several configurations that enable the formation of a variety of esters. Alkyl esters are stable, and can be formed quickly and quantitatively. By altering the length of the substituted alkyl group, retention of the derivative can be varied. In addition to the formation of simple esters, alkylation reagents can be used in extractive procedures where biological matrices can be present.

BF_3 in Methanol

BF_3 in Methanol

BF_3 in Methanol is an Alkylation Reagent for GC Derivatization and is the most commonly used method of forming methyl esters of organic acids.

Physical and Chemical Properties

Suggested Storage Conditions: 2-8°C

3.0 N HCl in n-Butanol (opposite page)

3.0 N HCl in n-Butanol

Most commonly used for rapid diagnosis of neonatal blood spots by Tandem Mass Spectrometry.

3N HCl in n-Butanol is a derivatization reagent required for newborn screening for metabolic disorders. Neonatal screening, which has become a standard procedure in many countries, measures amino acids and acylcarnitines from a single drop of blood. Blood concentration of one or several of these compounds is either abnormally high or low in a variety of metabolic disorders in newborns. Derivatization with 3N HCl in n-Butanol ensures butylation of the carboxyl acid group of the analyte and formation of butyl ester, which forces ionization or makes charging of the analytes more efficient. Although direct analysis of extracted acycarnitine without derivatization is possible, according to different reports, butylesterification is superior with regard to sensitivity and specificity. Methods that include derivatization with 3N HCl in n-Butanol is the only validated procedure at this time.

Many factors contribute to the success of a newborn screening process. Any impurities in derivatization reagent can potentially interfere with the analysis. 3N HCl in n-Butanol from Regis Technologies is manufactured under cGMP protocols to assure highest quality and lot-to lot consistency for this reagent. Each lot is tested by tandem mass spectrometry to ensure absence of contaminants which may interfere with analysis. Our Quality Assurance department reviews and approves all production documentation and test results. Regis takes necessary precautions that assure the quality of our 3N HCl in n-Butanol.

Physical and Chemical Properties

Suggested Storage Conditions: 2-8°C

Product	Size	Catalog #
3.0N HCl in n-Butanol	4 x 25 mL	1-201007-200
	100 mL	1-201009-200
	500 mL	1-201010-200
BF_3 in Methanol	100 mL	1-270260-200
	500 mL	1-270263-200
	1000 mL	1-270264-200
	5 x 8 mL	1-270265-200

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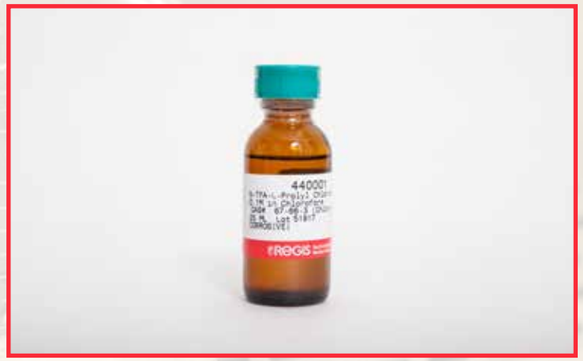
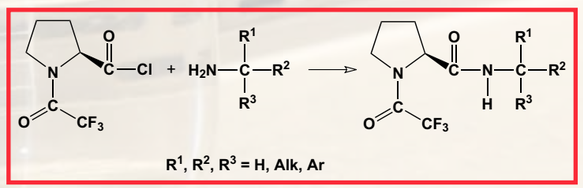
ACYLATION REAGENTS

Acylation reagents offer the same types of advantages available from silylation reagents: creating less polar, more volatile derivatives. However, in comparison to silylating reagents, the acylating reagents more readily target highly polar, multi-functional compounds, such as carbohydrates and amino acids. In addition, acylating reagents provide the distinct advantage of introducing electroncapturing groups, thus enhancing detectability during analysis.

Generally, these reagents are available as acid anhydrides, acyl derivatives, or acyl halides. The acyl halides and acyl derivatives are highly reactive and are suitable for use where steric hindrance may be a factor. Acid anhydrides are supplied in a number of fluorinated configurations, which improve detection. These fluorinated anhydride derivatives are used primarily for Electron Capture Detection (ECD), but can also be used for Flame Ionization Detection (FID). Fluorinated anhydrides are often used in derivatizing samples to confirm drugs of abuse. Despite the special utility of these reagents, their acidic nature requires that any excess or byproducts be removed prior to analysis to prevent deterioration of the column.

TPC





TPC: N-Trifluoroacetyl-L-Prolyl Chloride

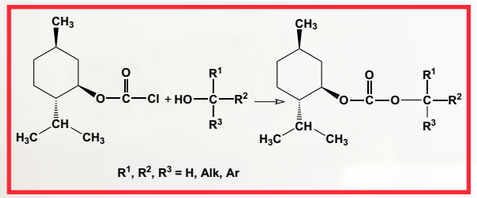
TPC is a GC Chiral and Specialty Derivatization Reagent and is the reagent of choice for the resolution of optically active amines by gas chromatography. TPC provides sample volatility and couples with amines to form diastereomers which can be separated on GC columns. Its use in the determination of amphetamines and other drugs of abuse testing has attracted considerable interest.

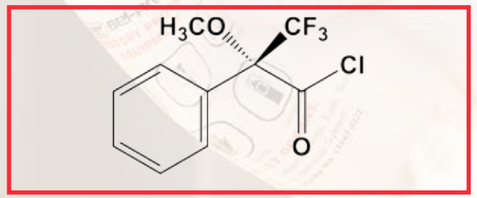
Physical and Chemical Properties

Suggested Storage Conditions: 2-8°C
Use: Derivatization Enantiomeric Purity Reagent for GC
Appearance: Clear, colorless liquid
BP: 61-62°C (141-143°F) (CHCl3)

MCF (opposite page)

(R)-(-)-MTPA-Cl (opposite page)





MCF: (1R, 2S, 5R)-(-)-Menthychloroformate

MCF is a GC Chiral and Speciality Derivatization Reagent and is a companion reagent to TPC. MCF is most generally used for the resolution of optically active alcohols (MCF reacts with amines also, but the resulting diastereomers are harder to separate than are the TPC derivatives).

Physical and Chemical Properties

Suggested Storage Conditions: Cool Place (2-8°C)
Use: Derivatization Enantiomeric Purity Reagent

(R)-(-)-MTPA-Cl, Mosher's Acid Chloride

(R)-(-)-MTPA-Cl, or Mosher's Acid Chloride, is a GC Chiral and Specialty Derivatization Reagent that is used for the determination of enantiomeric purities of alcohols and amines.

Physical and Chemical Properties

Suggested Storage Conditions: Cool Place
Use: Derivatization Enantiomeric Purity Reagent for GC

Product	Size	Catalog #
TPC	25 mL	1-440001-200
	5 mL	1-440002-200
MCF	25 mL	1-440003-200
(R)-(-)-MTPA-Cl	100 mg	1-270900-200
	500 mg	1-270901-200
	1000 mg	1-270902-200

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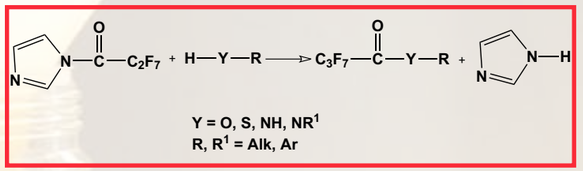
HFBI



HFBI:

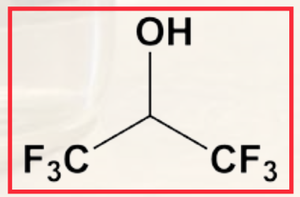
Heptafluorobutyrylimidazole

HFBI is an Acylation Reagent for GC Derivatization that readily forms derivatives with phenols, alcohols, and amines suitable for ECD. The reactions are fast and mild and Imidazole is not acidic, so no decomposition or corrosion occurs on columns.

Physical and Chemical Properties

Use: Acylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 56-58°C (132-136°F)
MF: $C_7H_3F_7N_2O$
FW: 264.10 g/mol
Specific Gravity (H2O = 1.0): 1.5625
Suggested Storage Conditions: Cool place (2-8°C) with adequate ventilation and area suitable for combustibles. May be stored refridgerated.

HFIP



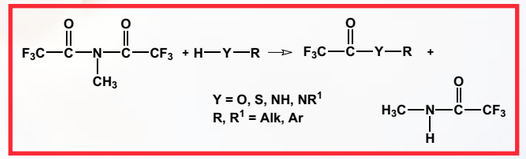
HFIP: 1,1,1,3,3,3-Hexafluoro-2-Propanol

Esterification reagent for the determination of aromatic acids in tissue by GC and electron capture detection.

MBTFA: N-Methyl-bis(trifluoroacetamide)

MBTFA is an Acylation Reagent for GC Derivatization that reacts rapidly under mild conditions with primary and secondary amines, while it reacts more slowly with alcohols, phenols, and thiols. MBTFA works well in the analysis of sugars.

Physical and Chemical Properties



Use: Acylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 123-124°C (253-255°F)
MF: $C_5H_3F_6NO_2$
FW: 223.07 g/mol
Specific Gravity (H2O = 1.0): 1.547
Suggested Storage Conditions: Store in a cool dry place with adequate ventilation and suitable for flammables.

Product	Size	Catalog #
HFBI	5 x 1 gm	1-270611-200
	5 gm	1-270612-200
	25 gm	1-270613-200
	100 gm	1-270615-200
HFIP	10 gm	1-270701-200
	25 gm	1-270702-200
	100 gm	1-270704-200
MBTFA	5 gm	1-270091-200
	10 x 1 gm	1-270092-200
	100 gm	1-270093-200
	25 gm	1-270095-200

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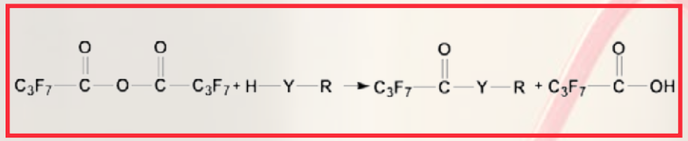
MBTFA (opposite page)

HFBA: Heptafluorobutyric Anhydride

HFBA is an Acylation Reagent for GC Derivatization that is most commonly used for ECD and reacts with alcholos, amines, and phenols. Bases such as triethylamine and trimethylamine can be added to promote reactivity to HFBA. HFBA is frequently used for the confirmation of drugs of abuse. HFBA derivatives are most sensitive to ECD.

Physical and Chemical Properties

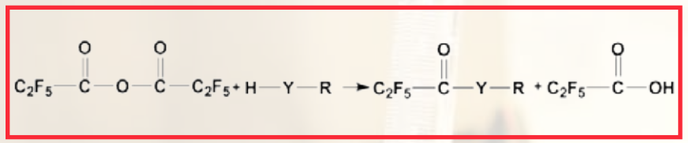


Use: Acylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 108-109°C (226-228°F)
MF: $C_8F_{14}O_3$
FW: 410.06 g/mol
Specific Gravity (H2O = 1.0): 1.653
Suggested Storage Conditions: Cool, dry place with adequate ventilation and suitable for corrosives.

PFPA: Pentafluoropropionic Anhydride

PFPA is an Acylation Reagent for GC Derivatization that is most commonly used for ECD and reacts with alcholos, amines, and phenols. Bases such as triethylamine and trimethylamine can be added to promote reactivity to PFPA. PFPA is frequently used for the confirmation of drugs of abuse. PFPA derivatives require the lowest analysis temperatures.

Physical and Chemical Properties

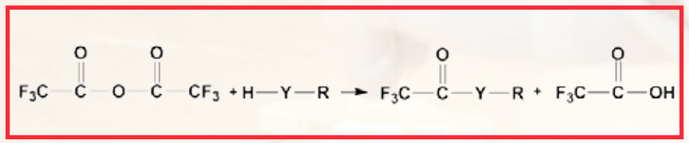


Use: Acylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 69-70°C (156-157°F)
MF: $C_6F_{10}O_3$
FW: 310.05 g/mol
Specific Gravity (H2O = 1.0): 1.571
Suggested Storage Conditions: Cool dry place with adequate ventilation and suitable for flammables.

TFAA: Trifluoroacetic Anhydride

TFAA is an Acylation Reagent for GC Derivatization that is most commonly used for ECD and reacts with alcholos, amines, and phenols. Bases such as triethylamine and trimethylamine can be added to promote reactivity to TFAA. TFAA is frequently used for the confirmation of drugs of abuse. TFAA is the most reactive and volatile of the anhydrides.

Physical and Chemical Properties



Use: Acylation Reagent for GC
Appearance: Clear, colorless liquid
BP: 39.5-40°C (103°F)
MF: $C_4F_6O_3$
FW: 210.03 g/mol
Specific Gravity (H2O = 1.0): 1.487
Suggested Storage Conditions: Cool, dry place with adequate ventilation and suitable for corrosives.

Product	Size	Catalog #
HFBA	10 x 1 gm	1-270851-200
	25 gm	1-270853-200
PFPA	10 x 1 gm	1-640110-200
	25 gm	1-640113-200
	100 gm	1-640114-200
	1000 gm	1-640115-200
TFAA	10 x 1 gm	1-270841-200
	25 gm	1-270843-200

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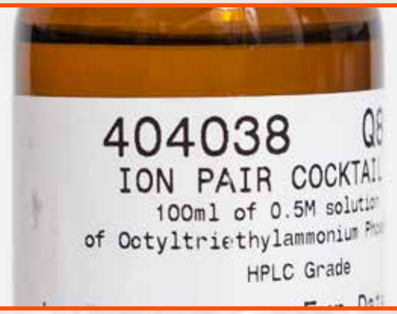
403328
1-Octanesulfonate, Sodium Salt
CAS# 5324-84-5 HPLC Grade
MW: 234.29 7.0 % H20 (K.F.)
500grams
Lot# 52072 Exp Date 07/2016
REGIS Technologies, Inc.
403128
MW: 234.29 7% H20 (K.F.)
100 Grams Lot# 52066
Exp Date 08/2016
REGIS Technologies, Inc. Morton Grove, IL 60053, U.S.A.
404038
ION PAIR COCKTAIL
100ml of 0.5M solution
HPLC Grade
Lot# 50746
REGIS Technologies, Inc.
405036
ION PAIR COCKTAIL
100ml of 0.5M solution
of Hexanesulfonate
HPLC Grade
Lot# 9930
REGIS Technologies, Inc.
403028
1-Octanesulfonate,
Monohydrate HPLC Grade
MW: 234.29
25 Grams
Exp Date
REGIS
405027
Contains 10ml
HPLC Grade
REGIS

The Advantages of Ion Pair Chromatography

In the past, chromatographic separation of charged analytes has been achieved by ion suppression (the careful adjustment of the mobile phase pH to result in a nonionized analyte). Determining the optimum mobile phase pH in ion suppression, however, often requires extensive method development. Samples containing more than one ionizable component were often unusable. The imitations of ion suppression led to the development of a new, more generally applicable approach to separation of ionized components: ion pair chromatography.

Developed by Dr. Gordon Schill in 1973, ion pair chromatography relies upon the addition of ionic compounds to the mobile phase to promote the formation of ion pairs with charged analytes. These reagents are comprised of an alkyl chain with an ionizable terminus. When used with common hydrophobic HPLC phases in the reversed-phase mode, ion pair reagents can be used to selectively increase the retention of charged analytes.



Although ion exchange chromatography has become a popular mode of separation, it is not useful in all situations.

ION PAIR CHROMATOGRAPHY OFFERS THE FOLLOWING ADVANTAGES OVER ION EXCHANGE CHROMATOGRAPHY:

- Simple preparation of buffers
- Wide choice of carbon chain lengths for improved retention and separation
- Significantly reduced separation time
- Simultaneous separation of both ionized and nonionized solutes
- Highly reproducible results
- Improved peak shape

Regis Provides a Choice of Reagents

Regis manufactures both ultrapure anionic Sulfonate (S-Series) and cationic Quaternary Amine (Q-Series) ion pair concentrates in the following alkyl chain lengths: pentyl, hexyl, heptyl, octyl, and dodecyl. Alkyl chains are represented by cardinal numbers in the naming of our products, i.e., 5, 6, 7, 8, and 12.

Purity is a Key Ingredient

Purity is of key importance in the manufacture of our Ion Pair Reagents. Regis S- and Q-Series products are synthesized in accordance with the industry's highest quality standards, resulting in exceptional purity and integrity. This is demonstrated in table 1: UV transparency as low as 200 nm can be achieved for both the S- and Q-Series reagents. In most cases, these absorbances are lower than those for HPLC grade acetonitrile and methanol. Although the S- and Q-Series ion pair reagents can be used at wavelengths less than 210 nm, the crucial factors in determining what wavelength to use are the integrity of the detector optics and the purity of the organic modifiers.

Regis also supplies bulk Sulfonate and several additional bulk Ion Pair Reagents to complement the separation capabilities of the Sulfonate S-Series and Quaternary Amine Q-Series.

How to Select a Regis Ion Pair Reagent For Method Development

To choose the proper reagent, alkyl chain lengths must be taken into consideration. The chain lengths enable selective separation of the analyte. The longer the chain, the more hydrophobic the counterion, and therefore, greater the retention. Retention may increase by a factor of almost 20 when going from pentyl (Q5) to dodecyl (Q12). The Q-reagent chain length governs benzoic acid retention times, but does not affect the benzyl alcohol retention times. Similar behavior can also be achieved with the S-Series.

The following are guidelines to developing a successful method using Regis' ion pair reagents:

- Select a column — endcapped ODS (octadecylsilyl) is most common.
- Use only HPLC-grade water and chromatography grade reagents in mobile phase preparation.
- Choose the mobile phase components and concentrations that give the best separation.
- If nonionic components are present in the sample, optimize the resolution prior to attempting ionic separations.
- Select the appropriate ion pair series to provide the necessary counterion. Use the Q-series for acidic compounds and the S-series for basic compounds.
- Through a process of elimination, choose the alkyl chain length which results in the best separation.
- Once the reagent has been selected, adjust the pH of the mobile phase to maximize resolution. Because slight modification of pH can profoundly effect retention and selectivity, make all adjustments in small increments and monitor carefully.
- Ideally, the ion pair reagent concentration in the mobile phase should be 0.005 M. However, small adjustments in reagent concentration may increase retention slightly and optimize the separation.

Product	Size	Catalog #
Ion Pair Concentrate Q-Series	1 Sampler Kit (Q5, Q6, Q7, Q8, Q12)	1-404020-200
Q5	5 x 10 mL	1-404025-200
	100 mL	1-404035-200
Q6	5 x 10 mL	1-404026-200
	100 mL	1-404036-200
Q7	5 x 10 mL	1-404027-200
	100 mL	1-404037-200
Q8	5 x 10 mL	1-404028-200
	100 mL	1-404038-200
Q12	5 x 10 mL	1-404021-200
	100 mL	1-404031-200
	500 mL	1-404041-200
Ion Pair Concentrate S-Series	1 Sampler Kit (S5, S6, S7, S8)	1-405020-200
S5	5 x 10 mL	1-405025-200
	100 mL	1-405035-200
S6	5 x 10 mL	1-405026-200
	100 mL	1-405036-200
S7	5 x 10 mL	1-405027-200
	100 mL	1-405037-200
S8	5 x 10 mL	1-405028-200
	100 mL	1-405038-200
1-Pentanesulfonate	25 gm	1-403025-200
	100 gm	1-403125-200
	1000 gm	1-403325-200
1-Hexanesulfonate	25 gm	1-403026-200
	100 gm	1-403126-200
	500 gm	1-403226-200
	1000 gm	1-403326-200
1-Heptanesulfonate	25 gm	1-403027-200
	100 gm	1-403127-200
	1000 gm	1-403327-200
1-Octanesulfonate	25 gm	1-403028-200
	100 gm	1-403128-200
	1000 gm	1-403328-200
Tetrabutyl Ammonium Phosphate o.5 M (pH=7.5)	10 mL	1-680502-200
	50 mL	1-680505-200
	500 mL	1-680503-200
	1 LT	1-680504-200

S-Series Ion Pair Concentrates (for cations)

The sulfonates are sodium salts that act as an anionic counterion for the separation and resolution of positively charged (1-hexylsodiumsulfonate) 100 mL bottle 405036 analytes. The sulfonates are available as: Ion pair concentrates—premixed solutions of alkyl sulfonates. When diluted to 1 L with HPLC-grade water, a 10 mL bottle forms a 0.005 M solution.

Bulk Ion Pair Reagents (for cations)

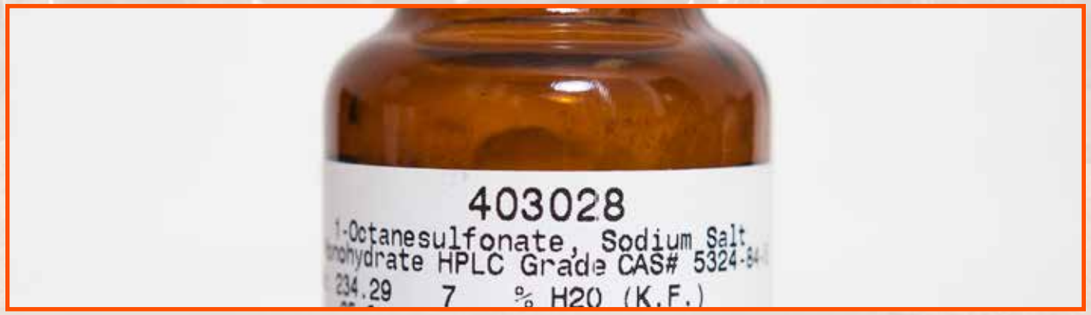
Bulk powder—fine, purified crystals, for use as a buffer in large-scale mobile phase preparation.

Q-Series Ion Pair Concentrates (for anions)

The Q-series is comprised of quaternary alkyltriethylamines that can be used for the resolution of negatively charged species. This unique set of cationic reagents was developed to complement the Sulfonate Series (S-Series) and is exclusively manufactured by Regis. The Quaternary Alkyltriethylamines are available as: Ion pair concentrates —premixed 0.5 M solutions of alkylamines. When diluted to 1 L with HPLC-grade water, a 10 mL bottle forms a 0.005 M buffered solution.

Other Regis Bulk Ion Pair Reagents (for anions)

Other bulk Ion Pair reagents such as Tetrabutylammonium phosphate, Trihexylamine and Triheptylamine are complementary reagents used for the resolution of negatively charged analytes.



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By Email (Preferred Method):

cservice@registech.com

By Phone:

(800) 323–8144 ext. 674 or 675
(847) 967–6000 ext. 674 or 675

Regis Customer Service

Representatives are available to take orders Monday-Friday, 8:00 a.m. to 4:00 p.m. CST.

By Fax:

(847) 967–5876

Fax orders can be placed 24 hours a day. Please include the information listed in Ordering Details below.

By Mail:

Regis Technologies, Inc.
8210 Austin Avenue
Morton Grove, IL 60053-0519 USA

ORDERING DETAILS

Whichever ordering method you choose, please supply the following information:

- Company name
- Shipping address
- Billing address
- Purchase order number
- Product #
- Quantity
- Contact person
- Phone number
- Fax number

PAYMENT DETAILS

Visa/Mastercard Accepted
Bank Wire Transfers Accepted

MINIMUM ORDERS

Regis does not require a minimum order.

ORDER CONFIRMATION

Confirming orders are not required. However, if it is your policy to send confirmations, please clearly indicate CONFIRMING ORDER. Regis will not accept responsibility for duplication of a shipment if CONFIRMING ORDER is not indicated.

TERMS AND PRICES

Prices:

Subject to change without prior notification.

Terms:

Net 30 days.

Shipping:

Prepaid and added to the invoice.

Advisement of current pricing will be made for orders placed by telephone. Unless order acknowledgment is specifically requested, orders placed via fax or mail will be shipped at current prices. If there has been a price increase of 10% or greater, Regis will advise the purchaser prior to order processing.

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Regis welcomes the opportunity to quote on larger quantities or bulk shipments of products listed in this catalog. Please contact Customer Service or your Sales Representative for more details.

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FedEx ground:

All items are shipped via FedEx ground service unless otherwise requested.

UPS Red/Blue or Federal Express:

Overnight or second day air service is available upon request. In order to comply with federal and international regulations, Regis reserves the right to change requested transportation in accordance with carrier guidelines.

Hazardous goods:

Regulations require that hazardous goods be shipped in certified containers, bags and/or cartons. Any special packaging and/or freight charges for these items will be prepaid and added to the invoice.

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Morton Grove, Illinois, USA

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Freight charges are prepaid and added to the invoice unless otherwise requested.

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Please inspect shipping carton and contents carefully upon arrival. Until the product has been evaluated, retain all product packaging.

If products are missing or defective, contact the Regis Customer Service Department for assistance. Items that need to be returned, whether due to defect or misorder, require a Returned Goods Authorization (RGA) number that can be obtained from Regis Customer Service. Returns will not be accepted without an RGA.

Returns made as a result of customer error are subject to a 15% or $15.00 restocking fee, whichever is greater. Except for cases of manufacturer defect, custom manufactured HPLC columns cannot be returned.

Every effort is taken to minimize product damage while in transit. However, if loss or damage should occur:

1. Save shipping cartons in their entirety.

2. Contact the carrier immediately to file a damage claim.

3. For additional assistance in filing claims, contact a Regis Customer Service Representative.

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REGIS® TECHNOLOGIES, INC.

About Regis Technologies

Regis Technologies, Inc. is a privately held company that provides synthesis and separations services to the pharmaceutical, biotechnology and other related industries. Regis provides innovative chromatography products and services, especially those with a chiral emphasis, through the utilization of our extensive organic expertise and collegiate collaborations.

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