POLIUM TECHNOLOGIES, INC

Polium Technologies, Inc.

"SMART" TECHNOLOGY FOR FINE CHEMICALS

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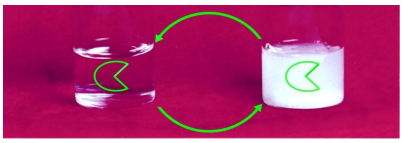
Technology description

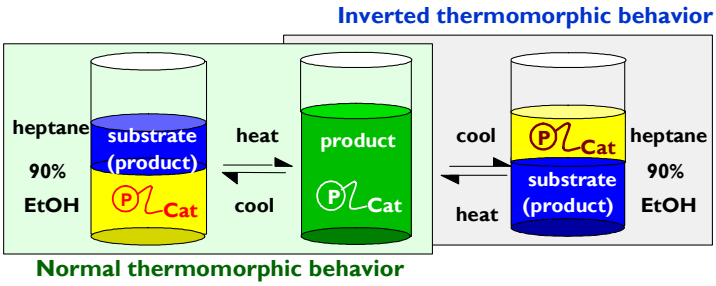
Cost-efficient industrial processes should meet two mutually exclusive requirements:

- **High volumetric productivity, which requires the use of homogeneous catalysts and reaction systems**
- **Easy work-up, which is always enhanced with heterogeneous catalysts and in heterogeneous reaction systems**

Our products are enzyme-polymer and ligand-polymer conjugates, combining the advantages of homogeneous and heterogeneous reaction systems, making them cost-effective and easy to separate. We have different systems available for both liquid/solid and liquid/liquid separations.

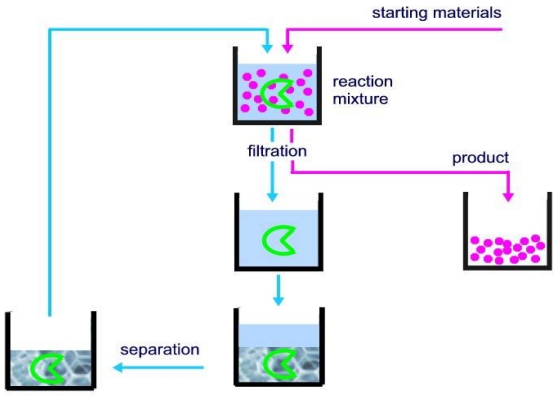


Demonstration of the temperature dependent reversible solubility of the enzyme-polymer conjugate. This Finezyme™ system is water soluble below 30 °C and precipitates with 99% efficiency above 35 °C.

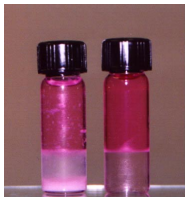


An example of both normal and inverted thermomorphic behavior of the ligand-polymer conjugate. After separation, Rexalyst™ system is in the upper or lower layer, depending on the structure of the polymer. Other solvent systems: EtOH-H2O/toluene, dimethylacetamide/heptane, fluorocarbons/hydrocarbons.

Reversibly Soluble Biocatalyst Finezyme™ Systems

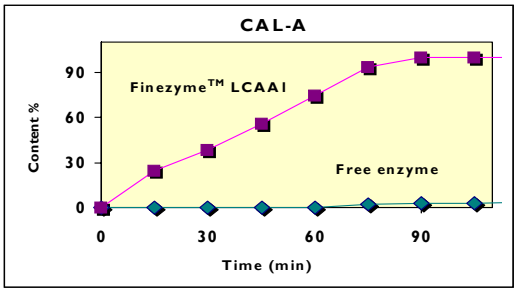


- **Industrial use of Polium Technologies Finezyme™ systems.**
- **Precipitation occurs reversibly under mild and narrow conditions, without enzyme denaturation.**
- **Our systems are cost-effective, stable and biocompatible.**



Layer separation between organic and aqueous phases for pure chymotrypsin (left) and chymotrypsin-polymer conjugate (right).

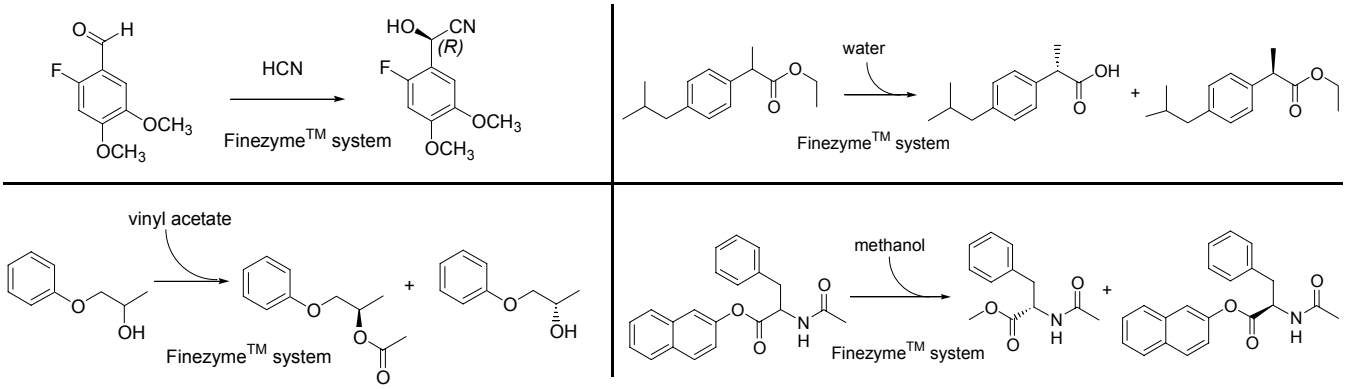
Specificity of Finezyme™ biocatalytical systems depends on the specificity of the enzyme that is used to make them. Polium Technologies offers two lines of recoverable Finezyme™ systems: thermoreversibly soluble systems and pH-reversibly soluble systems. The preparations contain up to 30% protein. Both products possess solubility in many organic solvents and their mixtures, and exhibit 10 - 40 fold enhanced specific activity in organic solvents compared to non-conjugated enzymes in the same solvent systems. They also provide easier work-up, because they form well defined partitions, compared to non-conjugated enzymes, which tend to form emulsions.



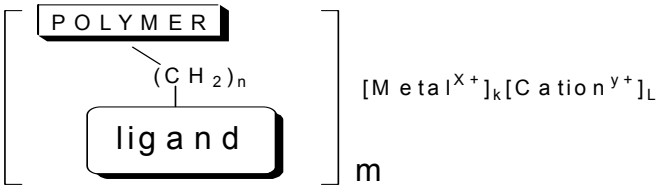
- **Increase of CAL-A activity in organic solvent after conjugation.**
- **Reaction: acylation of sec-phenethyl alcohol with vinyl acetate.**
- **Conditions: alcohol concentration - 200 mg/mL (1.5 M), enzyme concentration - 4.5 mg of protein per one mL.**

Technology description

Examples of chemical reactions catalyzed by our Finezyme™ systems.

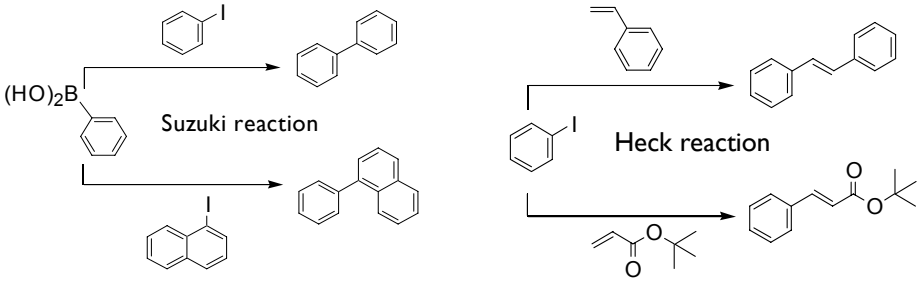


Homogeneous Recoverable Rexalyst™ Systems

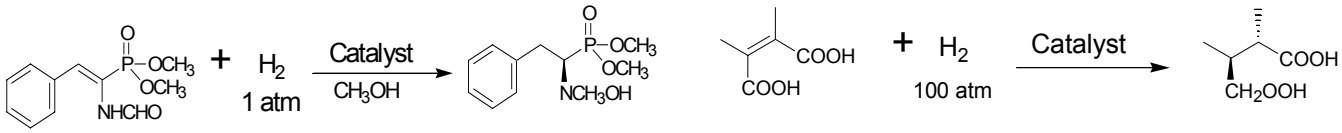


General structure of homogeneous recoverable Rexalyst™ systems which Polium Technologies offers to the market.

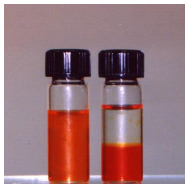
These catalyst systems can be used in normal and inverted thermomorphic systems, depending on the structure of the polymer [2-4]. At this moment, Polium Technologies offers several Rexalyst™ systems that can be used for asymmetric hydrogenation reactions, allylic substitutions, and Heck and Suzuki couplings under thermomorphic or latent biphasic conditions (see pages 7-8).



Sample reactions performed with the catalysts prepared from recyclable ligands offered by Polium Technologies.



After layer separation, depending on the structure of the polymer, the catalyst accumulates either in the polar phase (EtOH-H_2O, dimethylacetamide, etc); or in the non-polar phase (heptane).



Distribution of conjugated ligands during the reaction (left), and after the end of the reaction and layer separation (right).

[1] M.Y. Gololobov and V.M. Ilyashenko. Polium Technologies, Inc. Patent 6,433,078, USA 2002.
[2] D.E. Bergbreiter, P.L. Osborn, A. Wilson and E.M. Sink, J. Am. Chem. Soc. 122 (2000) 9058-9064.
[3] D.E. Bergbreiter, Chem. Rev. 102 (2002) 3345-3384.
[4] D.E. Bergbreiter, P.L. Osborn,, T. Smith, C. Li, J. Frels J. Am. Chem. Soc. 125 (2003) 6254-6260.

Custom R&D Services

Recoverable and Reusable Enzymes — Finezyme™ Systems

Polium Technologies, Inc. has developed a line of recoverable and reusable enzymes, the Finezyme™ system, which combine the advantages of both homogeneous and heterogeneous reaction systems. Precipitation of the enzyme-polymer conjugate occurs reversibly within narrow and mild conditions, without enzyme denaturation. The Finezyme™ system is cost-effective, stable, and biocompatible, and originally was developed by Polium Technologies using several lipases and proteases. However, this technology is capable of adaptation to work with a variety of different systems and enzymes. The polymers used with our enzymes are precipitable upon either a change in pH or temperature, depending on the polymer employed. The precipitation range can be varied by slight alterations to the polymers, allowing for a wide range of conditions to be used for your enzymatic reactions. Polium Technologies offers our expertise with reversibly soluble enzyme-polymer conjugates to the market, and will adapt our technology to meet your needs for easy enzyme recovery and reuse.

Homogeneous Recyclable Catalysts — Rexalyst™ Systems

Polium Technologies, Inc. also offers our expertise in the field of ligand-polymer conjugates, including ligands for asymmetric catalysis, via our new Rexalyst™ systems. This technology originally was developed with the diphenylphosphine ligand, and has now been adapted to use with a variety of other ligands, such as BINAP and BINOL. These ligand-polymer systems have been adapted to perform cross-coupling reactions in liquid-liquid biphasic systems, and to perform metal sequestration of heavy metals. The liquid-liquid biphasic system allows easy separation of product from polymer bound ligand-catalyst, consecutive reuse of your catalytic system, and reduces ligand and metal loss from oxidation. Altering the polymer's hydrophobicity allows complete control over which layer your ligand-polymer conjugate will reside in. This technology, allowing the recovery and reuse of your catalytic system, is adaptable to a variety of ligands and is useful for many transition metal catalyzed reactions, e.g., hydrogenations, Heck & Suzuki reactions.

Organic Chemistry

The scientific staff at Polium Technologies, Inc. has the knowledge and expertise to work in the following areas of organic chemistry:

- **Biocatalysis**
- **Chiral synthesis**
- **Organofluorine chemistry**
- **Chiral resolution**
- **Ionic Liquids**
- **Chiral β-amino acids**
- **Chiral ethanolamines**
- **Chiral cyanohydrins**
- **Phosphine chemistry**
- **Metal Sequestration**

Polium's scientists can design and carry out custom syntheses related to the above areas, or simply help you improve upon the methodologies you currently employ.

Catalog #	Product Name	Product Description	Price
Finezyme™ Systems			
FLCAB1	Finezyme™ LCAB1	Thermoreversibly soluble Finezyme™ systems prepared from Candida antarctica lipase type B	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLCAB2	Finezyme™ LCAB2	pH-Reversibly soluble Finezyme™ system prepared from Candida antarctica lipase type B	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLCAA1	Finezyme™ LCAA1	Thermoreversibly soluble Finezyme™ systems prepared from Candida antarctica lipase type A	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLCAA2	Finezyme™ LCAA2	pH-Reversibly soluble Finezyme™ system prepared from Candida antarctica lipase type A	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLCR1	Finezyme™ LCR1	Thermoreversibly soluble Finezyme™ systems prepared from Candida rugosa lipase	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLCR2	Finezyme™ LCR2	pH-Reversibly soluble Finezyme™ system prepared from Candida rugosa lipase	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLPC1	Finezyme™ LPC1	Thermoreversibly soluble Finezyme™ systems prepared from Pseudomonas cepacia lipase	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLPC2	Finezyme™ LPC2	pH-Reversibly soluble Finezyme™ system prepared from Pseudomonas cepacia lipase	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLMM1	Finezyme™ LMM1	Thermoreversibly soluble Finezyme™ systems prepared from Mucor miehei lipase	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FLMM2	Finezyme™ LMM2	pH-Reversibly soluble Finezyme™ system prepared from Mucor miehei lipase	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FS1	Finezyme™ S1	Thermoreversibly soluble Finezyme™ systems prepared from Subtilisin Carlsberg	1g - $297.00 10g - $2100.00 Over 10 g - inquire
FC1	Finezyme™ C1	Thermoreversibly soluble Finezyme™ systems prepared from Bovine Chymotrypsin	1g - $297.00 10g - $2100.00 Over 10 g - inquire

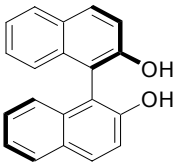
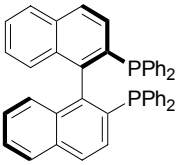
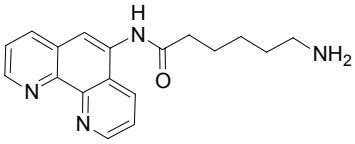
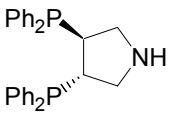
Catalog #	Product Name	Structure	Price

Free Enzymes

Protein content and activity of these preparations is at least 2-3 times higher than those of other commercially available prepara-

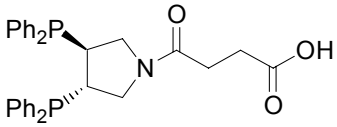
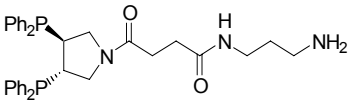
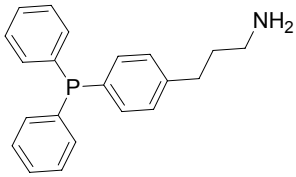
ECAL-A	*Candida antarctica* Lipase type A; protein content: >40%, activity: 80—100 tributirin units/mg	1g - $125.00 10g -$990.00 100 g - $4500.00 over 100 g - inquire
ECAL-B	*Candida antarctica* Lipase type B; protein content: >50%, activity: 300—400 tributirin units/mg	1g - $145.00 10g -$1250.00 100 g - $7000.00 over 100 g - inquire
ERML	Lipase from *Rhizopus miehei*; protein content: >40%, activity: 500—1000 tributirin units/mg	1g - $175.00 10g -$1650.00 100 g - $6000.00 over 100 g - inquire
ETLL	Lipase from *Thermomyces lanuginosus*; protein content: >40%, activity: 5000—10000 tributirin units/mg	1g - $185.00 10g -$1650.00 100 g - $9000.00 over 100 g - inquire
ESCP	Protease from *Bacillus licheniformis*; protein content: >40%, activity: 10—15 casein units/mg	1g - $185.00 10g -$1650.00 100 g - $9000.00 over 100 g - inquire

Free Ligands

FL 001R	(*R*)-1,1´-Bi(2-naphthol) **(*R*)-BINOL**, FW 286.33		1g - $ 9.80 10g -$ 86.70 100 g - $ 590.00 over 100 g - inquire
FL 001S	(*S*)-1,1´-Bi(2-naphthol) **(*S*)-BINOL**, FW 286.33	Same structure as FL 001R with the opposite stereconfiguration	Same as FL 001R
FL 002R	(*R*)-2,2´-Bis(diphenylphosphino)-1,1'-binaphthyl **(*R*)-BINAP**, FW 622.67		1g - $ 99.00 10g -$ 589.00 100 g - $ 3375.00 over 100 g - inquire
FL 002R	(*S*)-2,2´-Bis(diphenylphosphino)-1,1'-binaphthyl **(*S*)-BINAP**, FW 622.67	Same structure as FL 002R with the opposite stereconfiguration	Same as FL 002R
FL 003	6-Amino-hexanoic acid [1,10] phenanthrolin-5-ylamide **Modified Phenanthroline** FW 308.38		1g - $ 211.00 10g -$ 1743.00 over 10 g - inquire
FL 004	(*S*,*S*)-3,4-Bis-diphenylphosphanyl-pyrrolidine Synonyms: **(*S*,*S*)-PyrPhos** FW 439.47		1g - $ 385.00 10g -$ 3225.00 over 10 g - inquire

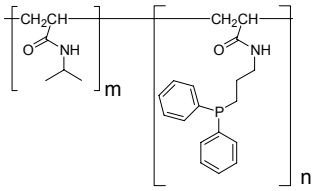
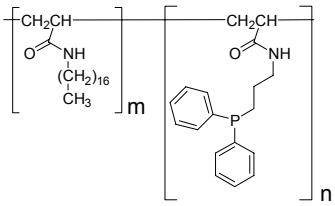
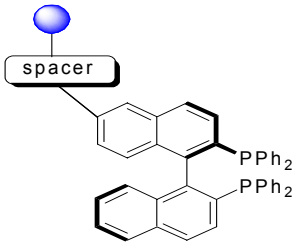
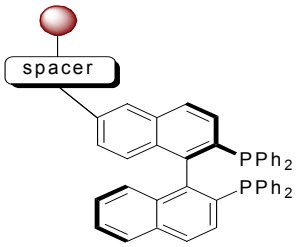
Catalog #	Product Description	Structure	Price

Free Ligands

FL 005	4-((*S*,*S*)-3,4-Bis-diphenylphosphanyl-pyrrolidin-1-yl)-4-oxo-butyric acid FW 539.54 **Modified PyrPhos**		1g - $ 425.50 10g -$ 3761.00 over 10 g - inquire
FL 006	N-(3-Amino-propyl)-4-((*S*,*S*)-3,4-bis-diphenylphosphanyl-pyrrolidin-1-yl)-4-oxo-butyramide FW 595.65 **Modified PyrPhos**		1g - $ 486.50 10g -$ 4063.00 over 10 g - inquire
FL 007	3-(4-Diphenylphosphanyl-phenyl)-propylamine **Modified Triphenylphosphine** FW 319.38		1g - $ 161.50 10g -$ 1383.00 over 10 g - inquire

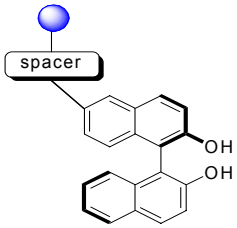
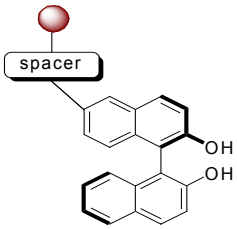
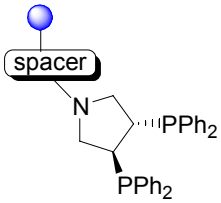
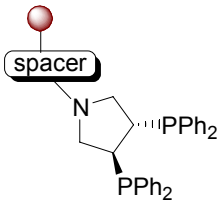
Rexalyst™ Systems

All Rexalyst™ systems are designed for use in thermomorphic and latent biphasic systems (see page 3).

CL1	**Diphenylphosphine**; **Attached to Hydrophilic Polymer Support** Phosphine ligand content: 2 - 4%; for use in thermo-morphic and latent biphasic systems as a catalyst and palladium or rhodium scavenger.		1 g - $32.40 10 g - $283.00 over 10 g - inquire
CL1C	**Pd(0) Catalyst Prepared Using Ligand CL1** Each vial contains enough coordinated Pd(0) catalyst to form one gram of biphenyl under Suzuki reaction conditions in one cycle in thermomorphic systems.	Solution of the Pd(0) catalyst in dimethylacetamide coordinated with CL1	5 ml — $197.00
CL2	**Diphenylphosphine**; **Attached to Hydrophobic Polymer Support** Phosphine ligand content: 2 - 4% Same uses as **CL1**.		1 g - $38.60 10 g - $320.00 over 10 g - inquire
CL3-R0	**(*R*)-BINAP, Attached to Hydrophilic Polymer Support** BINAP content: 7 - 10%		1 g - $527.00 10 g - $4250.00 over 10 g - inquire
CL3-R1	**(*R*)-BINAP, Attached to Hydrophobic Polymer Support** BINAP content: 7 - 10%		1 g - $539.00 10 g - $4332.00 over 10 g - inquire

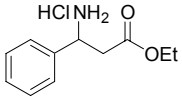
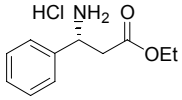
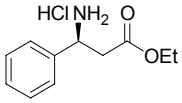
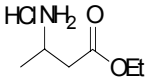
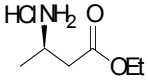
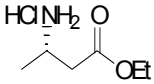
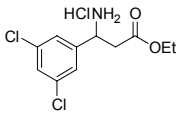
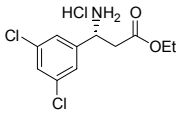
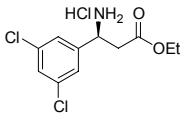
Catalog #	Product Name	Structure	Price

Rexalyst™ Systems

CL3-S0	**(*S*)-BINAP; Attached to Hydrophilic Polymer Support** BINAP content: 7 - 10%	The same as CL3-R0 with the opposite stereoconfiguration	1 g - $527.00 10 g - $4250.00 over 10 g - inquire
CL3-S1	**(*S*)-BINAP; Attached to Hydrophobic Polymer Support** BINAP content: 7 - 10%	The same as CL3-R1 with the opposite stereoconfiguration	1 g - $539.00 10 g - $4332.00 over 10 g - inquire
CL4-R0	**(*R*)-BINOL; Attached to Hydrophilic Polymer Support** BINOL content: 7 - 10%		1 g - $223.00 10 g - $890.00 over 10 g - inquire
CL4-R1	**(*R*)-BINOL; Attached to Hydrophobic Polymer Support** BINOL content: 7 - 10%		1 g - $237.00 10 g - $926.00 over 10 g - inquire
CL4-S0	**(*S*)-BINOL; Attached to Hydrophilic Polymer Support** BINOL content: 7 - 10%	The same as CL4-R0 with the opposite stereoconfiguration	1 g - $223.00 10 g - $890.00 over 10 g - inquire
CL4-S1	**(*S*)-BINOL; Attached to Hydrophobic Polymer Support** BINOL content: 7 - 10%	The same as CL4-R1 with the opposite stereoconfiguration	1 g - $237.00 10 g - $926.00 over 10 g - inquire
CL5-0	**(*S*,*S*)-PyrPhos; Attached to Hydrophilic Polymer Support** PyrPhos content: 7 - 10%		1 g - $516.00 10 g - $4190.00 over 10 g - inquire
CL5-1	**(*S*,*S*)-PyrPhos, Attached to Hydrophobic Polymer Support** PyrPhos content: 7 - 10%		1 g - $532.00 10 g - $4296.00 over 10 g - inquire

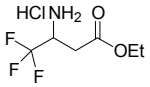
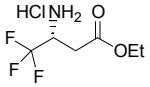
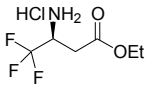
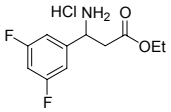
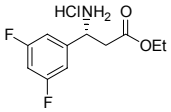
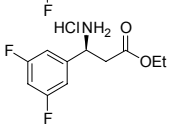
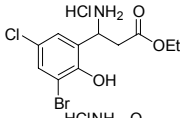
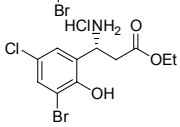
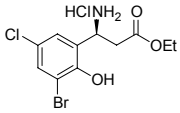
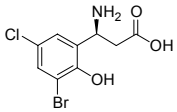
Catalog #	Product Name	Structure	Price

Beta-Amino acids

BAA 109	3-Amino-3-phenyl-propionic acid ethyl ester hydrochloride, Racemic, FW 229.70		10 g $290 100 g $1890
BAA 102	3-(*R*)-Amino-3-phenyl-propionic acid ethyl ester hydrochloride, FW 229.70, ee > 98%		10 g $1575 100 g $11,100
BAA 104	3-(*S*)-Amino-3-phenyl-propionic acid ethyl ester hydrochloride, FW 229.70, ee > 98%		10 g $3465 100 g $18,400
BAA 110	BAA 102 and BAA 104 purchased together	20 g (10 g of each stereoisomer) 200 g (100 g of each stereoisomer)	$4253 $19,060
BAA 141	3-Aminobutyric acid ethyl ester hydrochloride Racemic, FW 167.63		10 g $285 100 g $1990
BAA 142	3-(*R*)-Aminobutyric acid ethyl ester hydrochloride, FW 167.63, ee > 97%		10 g $1765 100 g $9780
BAA 143	3-(*S*)-Aminobutyric acid ethyl ester hydrochloride, FW 167.63, ee > 97%		10 g $3740 100 g $16,000
BAA 144	BAA 142 and BAA 143 purchased together	20 g (10 g of each stereoisomer) 200 g (100 g of each stereoisomer)	$4623 $14,560
BAA 133	3-Amino-3-(3,5-dichloro-phenyl)-propionic acid ethyl ester hydrochloride Racemic, FW 298.59		10 g $940 100 g $6580
BAA 108	3-(*R*)-Amino-3-(3,5-dichloro-phenyl)-propionic acid ethyl ester hydrochloride, FW 298.59, ee > 98%		10 g $4762 100 g $17,700
BAA 106	3-(*S*)-Amino-3-(3,5-dichloro-phenyl)-propionic acid ethyl ester hydrochloride, FW 298.59, ee > 98%		10 g $9875 100 g $25,100
BAA 134	BAA 106 and BAA 108 purchased together	20 g (10 g of each stereoisomer) 200 g (100 g of each stereoisomer)	$12256 $22,800

Catalog #	Product Name	Structure	Price

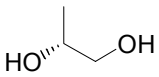
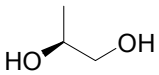
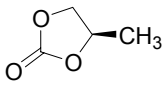
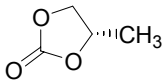
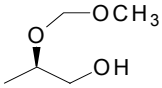
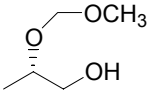
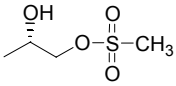
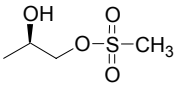
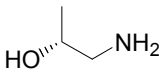
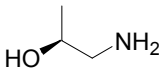
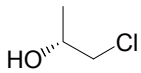
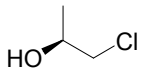
Beta-Amino acids

BAA 145	3-Amino-4,4,4-trifluorobutyric acid ethyl ester hydrochloride Racemic, FW 221.60		1 g $555 10 g $3,885
BAA 146	3-(*R*)-Amino-4,4,4-trifluorobutyric acid ethyl ester hydrochloride, FW 221.60, ee > 97%		1 g $2,775 10 g $8,440
BAA 157	3-(*S*)-Amino-4,4,4-trifluorobutyric acid ethyl ester hydrochloride, FW 221.60, ee > 97%		1 g $6,105 10 g $9,350
BAA 158	BAA 146 and BAA 157 purchased together	2 g (1 g of each stereoisomer) 2 g (1 g of each stereoisomer)	$7,493 $12,980
BAA 137	3-Amino-3-(3,5-difluoro-phenyl)-propionic acid ethyl ester hydrochloride Racemic, FW 265.7		10 g $443 100 g $3,010
BAA 162	3-(*R*)-Amino-3-(3,5-difluoro-phenyl)-propionic acid ethyl ester hydrochloride, FW 265.7, ee > 98%		10 g $2,150 100 g $12,100
BAA 160	3-(*S*)-Amino-3-(3,5-difluoro-phenyl)-propionic acid ethyl ester hydrochloride, FW 265.7, ee > 98%		10 g $4,873 100 g $18,700
BAA 138	BAA 160 and BAA 162 purchased together	20 g (10 g of each stereoisomer) 200 g (100 g of each stereoisomer)	$5,948 $17,000
BAA 139	3-Amino-3-(3-bromo-5-chloro-2-hydroxy-phenyl)-propionic acid ethyl ester hydrochloride Racemic, FW 359		10 g $998 100 g $5030
BAA 156	3-(*R*)-Amino-3-(3-bromo-5-chloro-2-hydroxy-phenyl)-propionic acid ethyl ester hydrochloride, FW 359, ee > 98%		10 g $3,020 100 g $12,700
BAA 154	3-(*S*)-Amino-3-(3-bromo-5-chloro-2-hydroxy-phenyl)-propionic acid ethyl ester hydrochloride, FW 359, ee > 98%		10 g $6,644 100 g $26,040
BAA 153	3-(*S*)-Amino-3-(3-bromo-5-chloro-2-hydroxy-phenyl)-propionic acid, FW 294.5, ee > 98%		10 g $2,904 100 g
BAA 140	BAA 154 and BAA 156 purchased together	20 g (10 g of each stereoisomer) 200 g (100 g of each stereoisomer)	$8,154 $19,900

Please inquire about beta-amino acids not featured, and about pricing if quantities different than those indicated in the catalog are required.

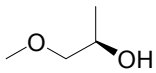
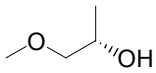
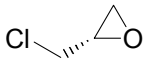
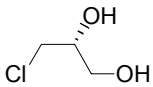
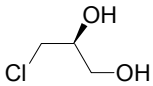
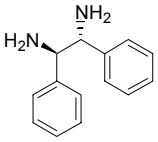
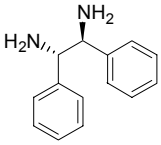
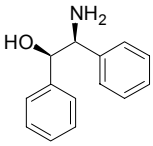
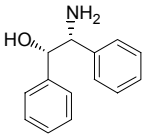
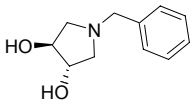
Catalog #	Product Name	Structure	Price	

Chiral Intermediates

CI 201	(*R*)-1,2-Propanediol, CAS# 4254-14-2 FW 76.09, ee > 98%		1 g 5 g 25 g	$22.50 $86.50 $236.00
CI 202	(*S*)-1,2-Propanediol, CAS# 4254-15-3 FW 76.09, ee > 98%		1 g 5 g 25 g	$24.75 $88.75 $251.00
CI 203	(*R*)-Propylene carbonate, CAS# 16606-55-6 FW 102.09, ee > 98%		1 g 5 g 25 g	$33.25 $83.50 $214.00
CI 204	(*S*)-Propylene carbonate, CAS# 51260-39-0 FW 102.09, ee > 98%		1 g 5 g 25 g	$33.50 $85.75 $227.00
CI 205	(*R*)-2-Methoxymethoxy-1-propanol FW 120.15, ee > 98%		1 g 5 g 25 g	$48.5 $151.00 $305.00
CI 206	(*S*)-2-Methoxymethoxy-1-propanol FW 120.15, ee > 98%		1 g 5 g 25 g	$52.75 $174.00 $329.00
CI 207	(*R*)-Methanesulfonic acid 2-hydroxy-propyl ester FW 154.19, ee > 98%		1 g 5 g 25 g	$47.20 $148.50 $295.00
CI 208	(*S*)-Methanesulfonic acid 2-hydroxy-propyl ester FW 154.19, ee > 98%		1 g 5 g 25 g	$49.80 $157.00 $317.00
CI 209	(*R*)-1-Amino-2-propanol, CAS# 2799-16-8 FW 75.11, ee > 98%		1 g 5 g 25 g	$27.50 $105.00 $445.00
CI 210	(*S*)-1-Amino-2-propanol, CAS# 2799-17-9 FW 75.11, ee > 98%		1 g 5 g 25 g	$28.75 $112.00 $481.00
CI 211	(*R*)-1-Chloro-2-propanol FW 94.54, ee > 98%		1 g 5 g 25 g	$45.60 $171.00 $623.00
CI 212	(*S*)-1-Chloro-2-propanol FW 94.54, ee > 98%		1 g 5 g 25 g	$47.20 $186.00 $658.00

Catalog #	Product Name	Structure	Price	

Chiral Intermediates

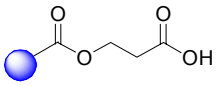
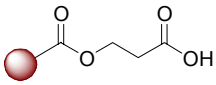
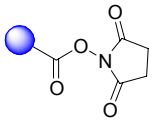
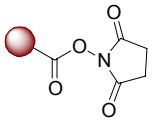
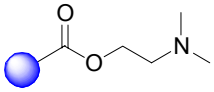
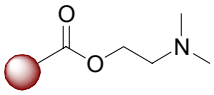
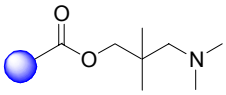
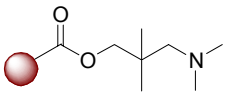
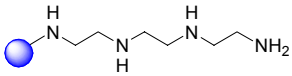
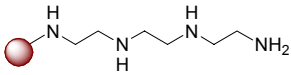
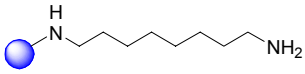
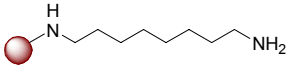
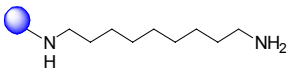
CI 213	(*R*)-1-Methoxy-2-propanol, CAS# 49840-22-9 FW 90.12, ee > 98%		1 g 5 g 25 g	$56.40 $187.00 $647.00
CI 214	(*S*)-1-Methoxy-2-propanol, CAS# 26550-55-0 FW 90.12, ee > 98%		1 g 5 g 25 g	$59.50 $204.00 $701.00
CI 215	(*R*)-Epichlorohydrin, CAS# 51594-55-9 FW 92.52, ee > 98%		1 g 5 g 25 g	$22.90 $98.50 $206.00
CI 216	(*S*)-Epichlorohydrin, CAS# 67843-74-7 FW 92.52, ee > 98%		1 g 5 g 25 g	$23.50 $101.00 $212.00
CI 217	(*R*)-3-Chloro-1,2-propanediol, CAS# 57090-45-6 FW 110.54, ee > 98%		1 g 5 g 25 g	$25.50 $88.75 $227.00
CI 218	(*S*)-3-Chloro-1,2-propanediol, CAS# 60827-45-4 FW 110.54, ee > 98%		1 g 5 g 25 g	$27.25 $95.50 $246.00
CI 219	(1*R*,2*R*)-(+)-1,2-Diphenyl-1,2-ethanediamine CAS# 35132-20-8, FW 212.29, ee > 98%		1 g 5 g 25 g	$87.50 $361.00 $678.00
CI 220	(1*S*,2*S*)-(-)-1,2-Diphenyl-1,2-ethanediamine CAS# 29841-69-8, FW 212.29, ee > 98%		1 g 5 g 25 g	$93.50 $385.00 $712.00
CI 221	(1*R*,2*S*)-(-)-2-Amino-1,2-diphenylethanol CAS# 23190-16-1, FW 213.28, ee > 98%		1 g 5 g 25 g	$23.25 $87.50 $326.00
CI 222	(1*S*,2*R*)-(+)-2-Amino-1,2-diphenylethanol CAS# 23364-44-5, FW 213.28, ee > 98%		1 g 5 g 25 g	$24.50 $88.75 $347.00
CI 222	(3*S*,4*S*)-(+)-1-Benzyl-3,4-pyrrolidindiol, 97% CAS# 90365-75-5, FW 193.24		250 mg 1 g 5 g	$62.25 $186.75 $628.00

Please contact us for 100 g prices, or to inquire about bulk availability.

Catalog #	Product Name	Structure	Price

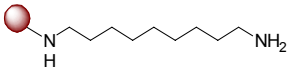
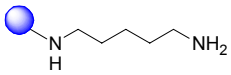
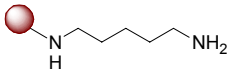
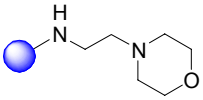
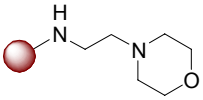
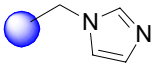
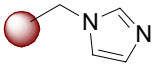
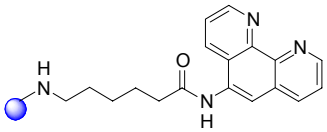
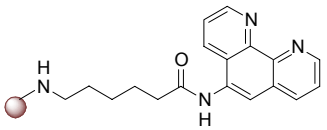
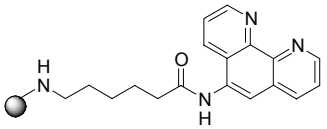
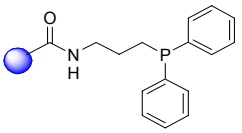
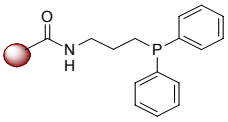
SoluScav™ Systems

p-NIPAM polymer is selectively soluble in polar solvents, while **p-NODAM** possesses selective solubility in non-polar solvents (see page 3). For questions about specific solvent systems, please contact Polium's technical service team at (847)-310-8725. All functionalized polymers contain ~ 4—6% scavenger by mass.

SS 101	**Carboxy functionalized PNIPAM** Used to scavenge amines, and for cobalt acetate immobilization during catalytic alkene epoxidations.		5 g $88.60 25 g $287.00 100 g $789.00
SS 102	**Carboxy acrylate functionalized p-NODAM** Same uses as **SS 101**.		5 g $96.50 25 g $303.00 100 g $853.00
SS 103	***N*-(Acryloxy)succinimide functionalized p-NIPAM** Nucleophile scavenger.		5 g $72.25 25 g $205.00 100 g $611.00
SS 104	***N*-(Acryloxy)succinimide functionalized p-NODAM** Same uses as **SS 103**.		5 g $79.50 25 g $269.00 100 g $726.00
SS 105	**Dimethylaminoethyl methacrylate functionalized p-NIPAM** Acid scavenger, and a base catalyst in Michael & Knovenagel reactions. Also catalyzes alkane oxidations.		5 g $82.25 25 g $248.00 100 g $635.00
SS 106	**Dimethylaminoethyl functionalized p-NODAM** Same uses as **SS 105**.		5 g $87.50 25 g $269.00 100 g $726.00
SS 107	**Dimethylaminoneopentyl functionalized p-NIPAM** Same uses as **SS 105**.		5 g $84.30 25 g $259.00 100 g $671.00
SS 108	**Dimethylaminoneopentyl functionalized p-NODAM** Same uses as **SS 105**.		5 g $91.25 25 g $395.00 100 g $742.00
SS 109	**Triethylenetetramine functionalized p-NIPAM** Metal scavenger: lead, cobalt, ruthenium, palladium.		5 g $55.25 25 g $143.00 100 g $355.00
SS 110	**Triethylenetetramine functionalized p-NODAM** Same uses as **SS 109**.		5 g $58.50 25 g $156.00 100 g $373.00
SS 111	**1,8-Diaminooctane functionalized p-NIPAM** Scavenger for acid chlorides, catalyst in Knove nagel reactions, and used in the extraction of sugars, separation of steriods, cholesterol and triglecerides.		5 g $34.50 25 g $93.00 100 g $245.00
SS 112	**1,8-Diaminooctane functionalized p-NODAM** Same uses as **SS 111**.		5 g $37.20 25 g $106.00 100 g $273.00
SS 113	**1,9-Diaminononane functionalized p-NIPAM**		5 g $31.60 25 g $87.00 100 g $233.00

Catalog #	Product Name	Structure	Price

SoluScav™ Systems

SS 114	**1,9-Diaminononane functionalized p-NODAM** Same uses as **SS 113**.		5 g $33.60 25 g $95.00 100 g $254.00
SS 115	**1,5-Diaminopentane functionalized p-NIPAM**		5 g $29.60 25 g $78.00 100 g $196.00
SS 116	**1,5-Diaminopentane functionalized p-NODAM** Same uses as **SS 115**.		5 g $31.60 25 g $84.00 100 g $212.00
SS 117	**4-(2-Aminoethyl)morpholine functionalized p-NIPAM** Phase selective base acid sponge.		5 g $99.50 25 g $361.00 100 g $993.00
SS 118	**4-(2-Aminoethyl)morpholine functionalized p-NODAM** Same uses as **SS 117**.		5 g $110.50 25 g $388.00 100 g $1041.00
SS 119	**1-Vinylimidazole functionalized p-NIPAM** Metal scavenger.		5 g $36.60 25 g $92.00 100 g $235.00
SS 120	**1-Vinylimidazole functionalized p-NODAM** Same uses as **SS 119**.		5 g $39.50 25 g $103.00 100 g $251.00
SS 121	**1,10-Phenanthroline functionalized p-NIPAM** Highly active metal scavenger for Cu, Fe, Rh, Ru, and a variety of other metals. See reference from D. Bergbreiter, *Macromol. Symp.* **2003**, *204*, 113-140.		5 g $212.00 25 g $917.00 100 g $2990.00
SS 122	**1,10-Phenanthroline functionalized p-NODAM** Same uses as **SS 121**.		5 g $236.00 25 g $968.00 100 g $3175.00
SS 122	**1,10-Phenanthroline functionalized Silica** Same uses as **SS 121**.		5 g $224.00 25 g $941.00 100 g $3093.00
CL 1	**Diphenylphosphine functionalized p-NIPAM** Metal scavenger and catalyst for Suzuki and Heck type coupling reactions.		5 g $32.40 25 g $395.00 100 g $786.00
CL 2	**Diphenylphosphine functionalized p-NODAM** Same uses as **CL 1**.		5 g $38.60 25 g $452.00 100 g $863.00

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