

Kits



ETREM

Kits



Strem Chemicals has been providing fine chemicals for research and commercial production for over fifty years. Our product categories include, metal catalysts and ligands for organic synthesis, heterogeneous catalysts, biocatalysts and more. We have grouped related products into kits for those customers interested in screening experiments. This booklet focuses on these kits and is organized by the product type. Please see the *Index of Kits* for a full listing and page references.

At Strem, we also offer a wide variety of nanomaterials and CVD/ALD precursors. Most of our products are of high purity, typically at 99%, while some are as high as 99.9999% metals purity. As an effort to expand our product line, we continually seek to provide new technologies from around the globe. We have licensing agreements with industry and academia, which allow easier access to these patent-protected products for our customers. We look forward to continued growth in order to best serve our customers' needs with the quality and service they can trust from Strem.

As part of our ongoing commitment to quality, we have achieved ISO 9001 certification for the Quality Management System (QMS) at our corporate headquarters in Newburyport, Massachusetts.

In addition, custom synthesis services are provided on a contract basis. For pharmaceutical applications, manufacturing is conducted under current Good Manufacturing Practices (cGMP) in FDA inspected kilo-lab suites. Complete documentation is available, including validation and stability studies. Active Drug Master Files (DMF's) are maintained in North America and Europe.

Our other booklets, which focus on applications and product classes, are available in print per request and also on our website. Below is a list of current booklet titles that are available. Please also check our Product Resources section online to find additional literature offerings, such as the Strem Chemiker, our technical publication, and product literature sheets.

- Biocatalysts
- Buchwald Ligands and Precatalysts
- Carbon-Based Nanomaterials & Elemental Forms
- Catalysts & Ligands - Sold in Collaboration with Takasago
- Gold Elements & Compounds
- Heterogeneous Catalysts
- High Purity Chiral Reagents - Sold in Collaboration with Daicel
- Kits
- Materials for Energy Applications
- Metal Catalysts for Organic Synthesis
- Metal Organic Frameworks and Ligands for MOF Synthesis
- Metathesis Catalysts
- MOCVD, CVD & ALD Precursors
- Nanomaterials
- New Products
- Other Ligands
- Phosphorous Ligands and Compounds
- Photocatalysts
- PURATREM: High Purity Inorganics

Ephraim S. Honig, Ph.D., M.B.A.
Chief Executive Officer



KITS 03/19

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Glossary of Terms

[α]_D		Specific rotation
AAS		Atomic Absorption Standard
ACS		Conforms to American Chemical Society specifications
air sensitive	.....	Product may chemically react with atmospheric oxygen or carbon dioxide at ambient conditions. Handle and store under an inert atmosphere of nitrogen or argon.
amp	.....	Ampouled
b.p.	.....	Boiling point in °C at 760mm, unless otherwise noted
d.	.....	Density
dec.	.....	Decomposes
elec. gr.	.....	Electronic Grade, suitable for electronic applications
f.p.	.....	Flash point in °F
gran.	.....	Granular
heat sensitive	.....	Product may chemically degrade if stored for prolonged periods of time at ambient temperatures or higher. Store at 5°C or lower.
hydrate	.....	Unspecified water content which may vary slightly from lot to lot
hygroscopic	.....	Product may absorb water if exposed to the atmosphere for prolonged periods of time (dependent on humidity and temperature). Handle and store under an inert atmosphere of nitrogen or argon.
light sensitive	.....	Product may chemically degrade if exposed to light
liq.	.....	Liquid
m.p.	.....	Melting point in °C
moisture sensitive	.....	Product may chemically react with water. Handle and store under an inert atmosphere of nitrogen or argon.
NMR grade	.....	Suitable as a Nuclear Magnetic Resonance reference standard
optical grade	.....	For optical applications
pwdr.	.....	Powder
primary standard	.....	Used to prepare reference standards and standardize volumetric solutions
PURATREM	.....	Product has a minimum purity of 99.99% (metals basis)
purified	.....	A grade higher than technical, often used where there are no official standards
P. Vol.	.....	Pore volume
pyrophoric	.....	Product may spontaneously ignite if exposed to air at ambient conditions
reagent	.....	High purity material, generally used in the laboratory for detecting, measuring, examining or analyzing other substances
REO	.....	Rare Earth Oxides. Purity of a specific rare-earth metal expressed as a percentage of total rare-earths oxides.
SA	.....	Surface area
store cold	.....	Product should be stored at -18°C or 4°C, unless otherwise noted (see product details)
subl.	.....	Sublimes
superconductor grade	.....	A high purity, analyzed grade, suitable for preparing superconductors
tech. gr.	.....	Technical grade for general industrial use
TLC	.....	Suitable for Thin Layer Chromatography
v.p.	.....	Vapor pressure mm of Hg
xtl.	.....	Crystalline

About Purity

Chemical purity	.....	is reported after the chemical name, e.g. Ruthenium carbonyl, 99%
Metals purity		is reported in parentheses with the respective element, e.g. Gallium (III) bromide, anhydrous, granular (99.999%-Ga) PURATREM where 100% minus the metal purity is equal to the maximum allowable percentage of trace metal impurity

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BIOCATALYST KITS - CalB immo Kit™ - Immobilized enzyme

96-4050

CalB immo KIT™ - Immobilized enzyme

Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Sold in collaboration with Purolite for research purposes only.

Components also available for individual sale. Contains the following:

07-3130	CalB immo Plus™ - Immobilized enzyme	10g
07-3142	CalB immo 8285™ - Immobilized enzyme	10g
07-3148	CalB immo 8806™ - Immobilized enzyme	10g
07-3152	CalB immo 5587™ - Immobilized enzyme	10g
07-3155	CalB immo 1090™ - Immobilized enzyme	10g
07-3159	CalB immo 5872™ - Immobilized enzyme	10g

Item #	Immobilized on	Immobilization	Enzyme activity (PLU/g dry)
07-3130	DVB/methacrylate	Adsorption	>9,000
07-3142	Epoxy/butyl methacrylate	Covelent	>10,000
07-3148	Octadecyl methacrylate	Adsorption	>10,000
07-3152	Styrene/DVB copolymer	Adsorption	>4,000
07-3155	Macroporous styrene/DVB	Adsorption	>8,000
07-3159	Styrene/DVB	Adsorption	>3,500

Appearance: White to slightly yellow spherical beads, free from foreign matter

Principal Applications: Screening of immobilized lipases for process development, Esterifications (regio- and stereo-selective), Transesterification, Amidation, Fats and oils modification

Advantages: Fast screening in process development, Wide selection of enzyme carriers for different applications

BIOCATALYST KITS - Lipase immo Kit - Immobilized enzymes

96-4065

Lipase immo Kit - Immobilized enzymes

The KIT contains 10g of each of the following:

- CalB immo Plus™ (Lipase from Candida antarctica B)*07-3130*
- CalA immo (Lipase from Candida antarctica A)
- TL immo (Lipase from Thermomyces lanuginosa)
- RM immo (Lipase from Rhizomucor miehei)
- CR immo (Lipase from Candida rugosa)
- PS immo (Lipase from Pseudomonas cepacia)

A selection of immobilized lipases on different Lifetech™ ECR enzyme carrier resins for screening purposes.

Store in dry conditions (2-8°C). Do not freeze.

Sold in collaboration with Purolite for research purposes only.

Principal Applications: Esterifications (regio- and stereo-selective), Transesterification, Kinetic resolution of racemic alcohols, amines, esters and triacylglycerides, Fats and oils modification, Hydrolysis of esters

Advantages: Fast screening in process development, Wide selection of immobilized lipases, Optimal for all applications in organic solvents.

BIOCATALYST KITS - Novozymes Endoprotease Screening Kit

96-0224

Novozymes Endoprotease Screening Kit (contains 6 endoprotease enzymes)

Store at 0-10°C. DO NOT FREEZE. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes
Components also available for individual sale. Contains the following:

06-3110	Alcalase® 2.4 L FG (9014-01-1)	10g
06-3112	Alcalase® 2.5 L (9014-01-1)	10g
06-3115	Esperase® 8.0 L (9014-01-1)	10g
06-3137	Savinase® 12 T (9014-01-1)	10g
06-3150	Savinase® 16 L (9014-01-1)	10g
06-3160	Neutrase® 0.8 L (9080-56-2)	10g

Item#	Density	Activity	Formulation	Optimal Conditions	Substrate Specificity
06-3110	1.17	2.4 AU-A/g	Liquid	30-65°C, pH 7-9	Serine endopeptidase
06-3112	1.08	2.5 AU-A/g	Liquid	30-65°C, pH 7-10	Serine endopeptidase
06-3115	1.07	8 KNPU-E/g	Liquid	pH 8-12.5	Serine endopeptidase
06-3137	1.13	12 KNPU S/g	Granulate	30-70°C, pH 8-10	Serine endopeptidase
06-3150	1.16	16 KNPU S/g	Liquid	30-70°C, pH 8-10	Serine endopeptidase
06-3160	1.26	0.8 AU/g	Liquid	40-50°C, pH 7	Metalloprotease

Optimal storage is 0-10°C/32-50°F. If stored above 25°C/77°F the samples should be used within 3 months.

BIOCATALYST KITS - Novozymes Lipase Screening Kit

96-0220

Novozymes Lipase Screening Kit (contains 9 lipase enzymes)

Store at 0-10°C. DO NOT FREEZE. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes
Components also available for individual sale. Contains the following:

06-3100	NovoCor® AD L (9001-62-1)	10g
06-3105	Lipozyme® CALB L (9001-62-1)	10g
06-3118	Palatase® 20000 L (9001-62-1)	5g
06-3120	Novozym® 40086 (9001-62-1)	5g
06-3123	Novozym® 435 (9001-62-1)	5g
06-3125	Resinase® HT (9001-62-1)	10g
06-3135	Novozym® 51032 (9001-62-1)	10g
06-3140	Lipozyme® TL 100 L (9001-62-1)	10g
06-3155	Lipozyme® TL IM (9001-62-1)	10g

Item#	Density	Activity	Formulation	Optimal Conditions	Substrate Specificity
06-3100	1.17	6000 LU/g	Liquid	30-60°C, pH 5-9	Sterically hindered esters
06-3105	1.20	5000 LU/g	Liquid	30-60°C, pH 5-9	Esters and alcohols
06-3118	1.19	20000 LU/g	Liquid	30-50°C, pH 7-10	Esters
06-3120	0.33	275 IUN/g	Immobilized Granulate	30-50°C, pH 7-10	Esters
06-3123	0.40	10000 PLU/g	Immobilized Granulate	30-60°C, pH 5-9	Esters and alcohols
06-3125	1.05	50 KLU/g	Liquid	up to 90°C, pH 5-8	Esters
06-3135	1.04	15 KLU/g	Liquid	35-70°C, pH 7-10	Esters
06-3140	1.05	100 KLU/g	Liquid	20-50°C, pH 7-10	Esters and diesters
06-3155	0.40	250 IUN/g	Immobilized Granulate	50-75°C, pH 6-8	Esters

Optimal storage is 0-10°C/32-50°F. If stored above 25°C/77°F the samples should be used within 3 months.

CATALYST & ORGANOCATALYST KITS - Apeiron Ammonium Catalysts Kit

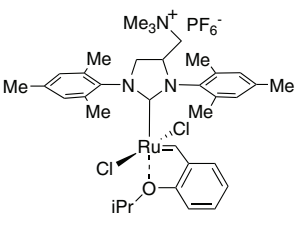
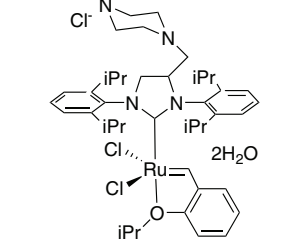
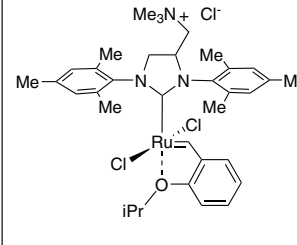
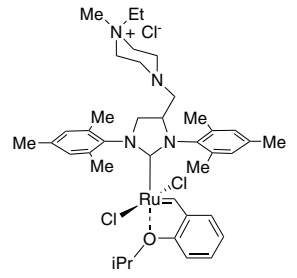
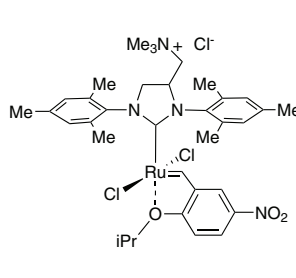
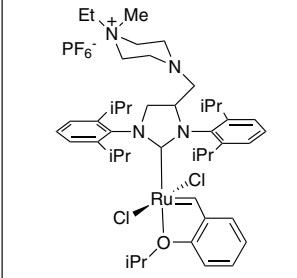
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Apeiron Ammonium Catalysts Kit

NEW

Sold in collaboration with Apeiron Synthesis, Inc. Complexes from our Ammonium Catalysts Kit can be applied to metathesis in neat water [44-0768 (AquaMet), 44-0765 (StickyCat Cl), 44-0795 (nitro-StickyCatCl)], ethyl acetate/dimethyl carbonate [44-0755 (StickyCat PF6), 44-0797 (FixCat PF6)] or heterogeneously after catalyst deposition on solid support [44-0768 (AquaMet), 44-0759 (FixCat)]. These catalysts are especially recommended for applications in which low levels of residual ruthenium is desired.

Components also available for individual sale. Contains the following:

 44-0755 StickyCat PF6 100mg	 44-0759 FixCat 100mg	 44-0765 StickyCat Cl 100mg
 44-0768 AquaMet 100mg	 44-0795 StickyCat Cl 100mg	 44-0797 FixCat PF6 100mg

CATALYST & ORGANOCATALYST KITS - Apeiron Bulky Catalysts Kit

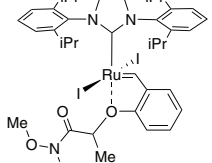
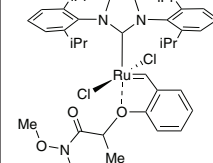
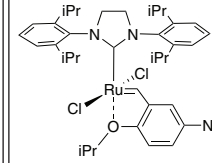
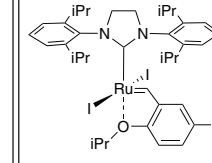
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Apeiron Bulky Catalysts Kit

NEW

Sold in collaboration with Apeiron Synthesis, Inc. Catalysts within the Bulky Catalysts Kit were designed to be less sensitive to minor impurities that are commonly present in metathesis substrates/solvents. The bulkiness of the ligands in this kit helps to reduce the risk of unwanted double-bond migration. These complexes are especially recommended for RCM and CM of sterically non-demanding substrates.

Components also available for individual sale. Contains the following:

 44-0748 GreenCat-I2 100mg	 44-0750 GreenCat 100mg	 44-0770 nitro-Grela SiPr 100mg	 44-0782 nitro-Grela I2 SiPr 100mg
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CATALYST & ORGANOCATALYST KITS - Apeiron nitro-Grela Catalysts Kit

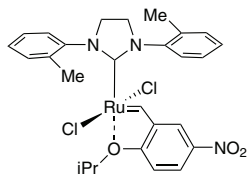
96-0410

NEW

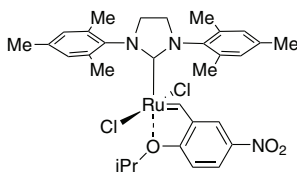
Apeiron nitro-Grela Catalysts Kit

Sold in collaboration with Apeiron Synthesis, Inc. Our nitro-Grela catalysts kit contains complexes with wide-ranging activity and application profiles. These testing catalysts have excellent potential within the early stages of development.

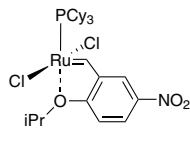
Components also available for individual sale. Contains the following:



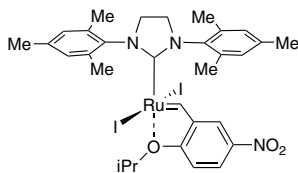
44-0740
nitro-Grela SI-o-Tolyl 100mg



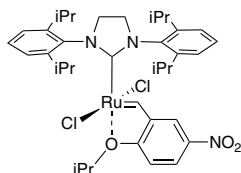
44-0758
nitro-Grela 100mg



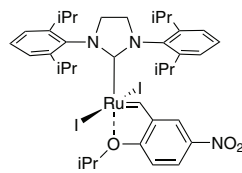
44-0763
nitro-Grela 1 gen. 100mg



44-0767
nitro-Grela I2 100mg



44-0770
nitro-Grela SiPr 100mg



44-0782
nitro-Grela I2 SiPr 100mg

CATALYST & ORGANOCATALYST KITS - Apeiron Polymerization Catalysts Kit

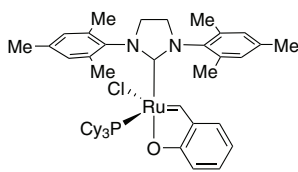
96-0430

NEW

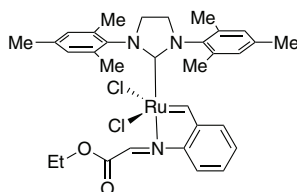
Apeiron Polymerization Catalysts Kit

Sold in collaboration with Apeiron Synthesis, Inc. The catalysts included in our Polymerization Catalysts Kit were specifically designed for ROMP of strained monomers such as dicyclopentadiene or norbornene. The latency of these catalysts allows for controlled preparation of formulation and curing within various conditions.

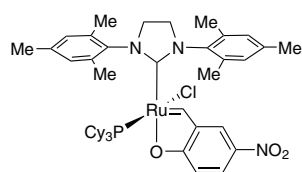
Components also available for individual sale. Contains the following:



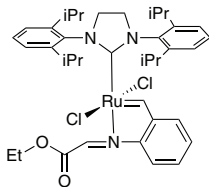
44-0753
LatMet 100mg



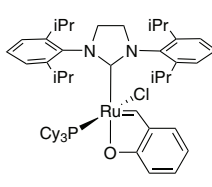
44-0760
HeatMet 100mg



44-0787
nitro-LatMet 100mg



44-0792
HeatMet SiPr 100mg



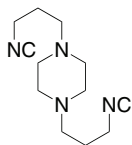
44-0793
LatMet SiPr 100mg

CATALYST & ORGANOCATALYST KITS - Apeiron Ruthenium Metathesis Catalysts Kit

96-0400

Apeiron Ruthenium Metathesis Catalyst Kit

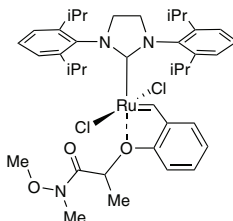
Sold in collaboration with Apeiron Synthesis, Inc. This kit also includes a metal scavenger (07-2203). Components also available for individual sale. Contains the following:



07-2203

SnatchCat Metal Scavenger

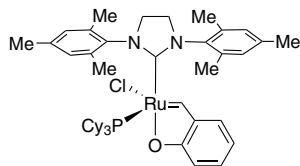
1g



44-0750

GreenCat

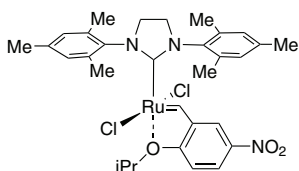
100mg



44-0753

LatMet

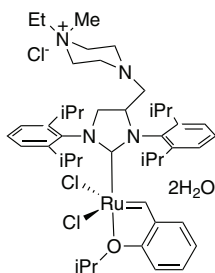
100mg



44-0758

nitro-Grela

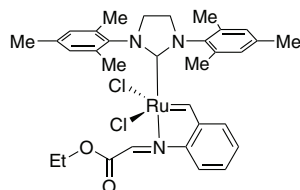
100mg



44-0759

FixCat

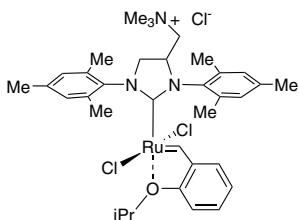
100mg



44-0760

HeatMet

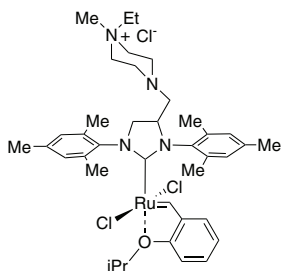
100mg



44-0765

StickyCat Cl

100mg



44-0768

AquaMet

100mg

CATALYST & ORGANOCATALYST KITS - BASF Blocking Group Removal Catalyst Kit

96-6715

BASF Blocking Group Removal Catalyst Kit

Sold in collaboration with BASF for research purposes only.

Components also available for individual sale. Contains the following:

46-1905	Palladium, 10% on activated wood carbon, reduced, 50% water wet (Escat™ 1931) (7440-05-3)	10g
46-1906	Palladium, 10% on activated wood carbon, unreduced, 50% water wet (Escat™ 1921) (7440-05-3)	10g
46-1907	Palladium, 3% on activated carbon, reduced, 50% water wet paste (Escat™ 1911) (7440-05-3)	10g
46-1908	Palladium, 5% on activated carbon, reduced, 50% water wet paste (Escat™ 1941) (7440-05-3)	10g
46-1909	Palladium, 5% on activated carbon, reduced, 50% water wet paste (Escat™ 1961) (7440-05-3)	10g
46-1911	Palladium, 5% on activated carbon, reduced, 50% water wet paste (Escat™ 1971) (7440-05-3)	10g

CATALYST & ORGANOCATALYST KITS - BASF Heterogeneous Catalyst Kit

96-6717

HAZ

BASF Heterogeneous Catalyst Kit

Product offered is commercial grade, sold in collaboration with BASF for research purposes only.

Components also available for individual sale. Contains the following:

44-4065	Ruthenium, 5% on activated carbon, reduced, 50% water wet paste (Escat™ 4401) (7440-18-8)	5g
45-1875	Rhodium, 5% on activated wood carbon, reduced, 50% water wet paste (Escat™ 3401) (7440-16-6)	1g
46-1707	Palladium, 20% on activated carbon (Pearlman's catalyst), unreduced, 50% water wet paste (Escat™ 1951) (7440-05-3)	5g
46-1710	Palladium, 0.6% on activated carbon, 50% water-wet paste (NanoSelect LF 100) (7440-05-3)	5g
46-1901	Palladium, 5% on activated peat carbon, reduced, 50% water wet paste (Escat™ 1621) (7440-05-3)	10g
46-1902	Palladium, 5% on activated wood carbon, reduced, dry (Escat™ 1431) (7440-05-3)	10g
46-1903	Palladium, 5% on activated wood carbon, reduced, 50% water wet paste (Escat™ 1421) (7440-05-3)	10g
46-1904	Palladium, 5% on activated wood carbon, unreduced, 50% water wet paste (Escat™ 1471) (7440-05-3)	10g
46-1905	Palladium, 10% on activated wood carbon, reduced, 50% water wet (Escat™ 1931) (7440-05-3)	10g
46-1951	Palladium, 5% on alumina powder, reduced, dry (Escat™ 1241) (7440-05-3)	5g
78-1611	Platinum, 5% on activated wood carbon, reduced, dry (Escat™ 2431) (7440-06-4)	5g
78-1612	Platinum, 5% on activated wood carbon, reduced, 50% water wet paste (Escat™ 2421) (7440-06-4)	5g
78-1613	Platinum, 5% on activated carbon, unreduced, 50% water wet paste (Escat™ 2441) (7440-06-4)	5g

CATALYST & ORGANOCATALYST KITS - BASF Palladium Catalyst Kit

96-6719

HAZ

BASF Palladium Catalyst Kit

Product offered is commercial grade, sold in collaboration with BASF for research purposes only. Components also available for individual sale. Contains the following:

46-1707	Palladium, 20% on activated carbon (Pearlman's catalyst), unreduced, 50% water wet paste (Escat™ 1951) (7440-05-3)	5g
46-1710	Palladium, 0.6% on activated carbon, 50% water-wet paste (NanoSelect LF 100) (7440-05-3)	5g
46-1901	Palladium, 5% on activated peat carbon, reduced, 50% water wet paste (Escat™ 1621) (7440-05-3)	10g
46-1902	Palladium, 5% on activated wood carbon, reduced, dry (Escat™ 1431) (7440-05-3)	10g
46-1903	Palladium, 5% on activated wood carbon, reduced, 50% water wet paste (Escat™ 1421) (7440-05-3)	10g
46-1904	Palladium, 5% on activated wood carbon, unreduced, 50% water wet paste (Escat™ 1471) (7440-05-3)	10g
46-1905	Palladium, 10% on activated wood carbon, reduced, 50% water wet (Escat™ 1931) (7440-05-3)	10g
46-1906	Palladium, 10% on activated wood carbon, unreduced, 50% water wet (Escat™ 1921) (7440-05-3)	10g
46-1951	Palladium, 5% on alumina powder, reduced, dry (Escat™ 1241) (7440-05-3)	5g

CATALYST & ORGANOCATALYST KITS - BASF Platinum Catalyst Kit

96-6721

HAZ

BASF Platinum Catalyst Kit

Product offered is commercial grade, sold in collaboration with BASF for research purposes only. Components also available for individual sale. Contains the following:

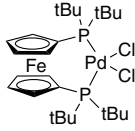
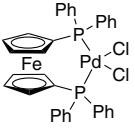
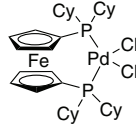
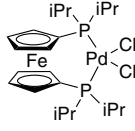
78-1611	Platinum, 5% on activated wood carbon, reduced, dry (Escat™ 2431) (7440-06-4)	5g
78-1612	Platinum, 5% on activated wood carbon, reduced, 50% water wet paste (Escat™ 2421) (7440-06-4)	5g
78-1613	Platinum, 5% on activated carbon, unreduced, 50% water wet paste (Escat™ 2441) (7440-06-4)	5g
78-1614	Platinum, 3% on activated wood carbon, reduced, 70% water wet paste (Escat™ 2931) (7440-06-4)	5g
78-1661	Platinum, 5% on alumina powder, reduced, dry (Escat™ 2941) (7440-06-4)	5g
78-1892	Platinum(IV) oxide hydrate (~80-82% Pt) (99.95+%-Pt) ADAMS' CATALYST [BASF C7018] (52785-06-5)	1g

CATALYST & ORGANOCATALYST KITS - [1,1'-Bis(dialkyl/diarylphosphino)ferrocene] palladium(II) dichloro Catalyst Kit

96-3735

[1,1'-Bis(dialkyl/diarylphosphino)ferrocene]palladium(II) dichloro Catalyst Kit

Components also available for individual sale. Contains the following:

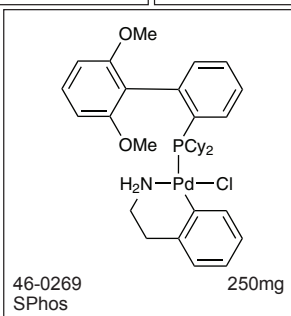
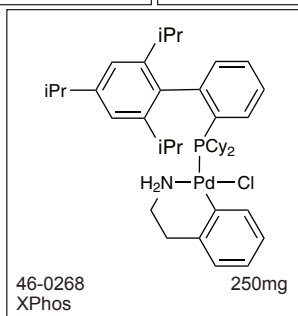
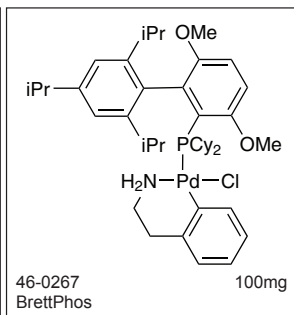
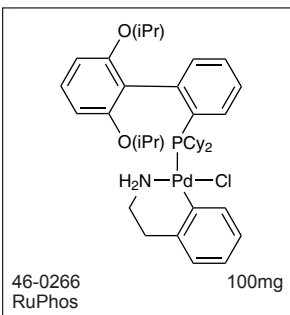
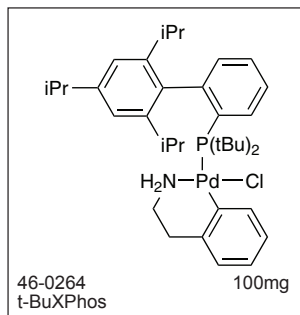
	46-0445	500mg		46-0450	1g		46-0455	250mg		46-0460	500mg
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CATALYST & ORGANOCATALYST KITS - Buchwald Palladacycle Precatalyst Kit 1

96-5503

Buchwald Palladacycle Precatalyst Kit 1 (Chloro-2-aminoethylphenyl- Palladacycles Gen. 1)
 Patents US 6,395,916, US 6,307,087.

Components also available for individual sale. Contains the following:

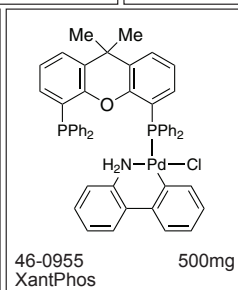
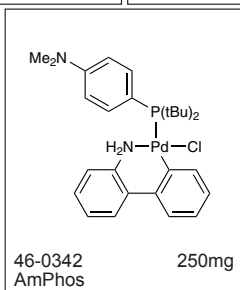
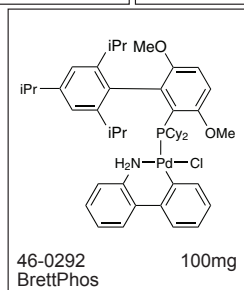
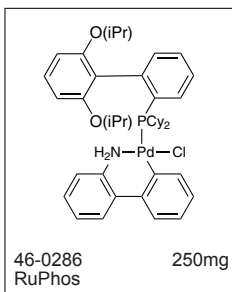
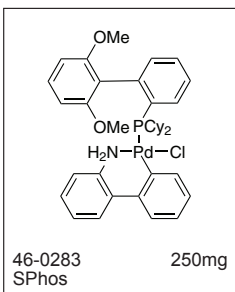
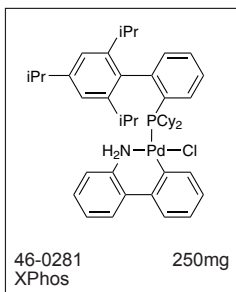
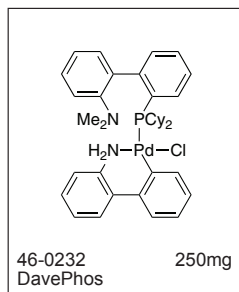


CATALYST & ORGANOCATALYST KITS - Buchwald Palladacycle Precatalyst Kit 3

96-5508

Buchwald Palladacycle Precatalyst Kit 3 (Chloro-2'-amino-1,1'-biphenyl-2-yl- Palladacycles Gen. 2)
 Patents: US 6,395,916, US 6,307,087.

Components also available for individual sale. Contains the following:



CATALYST & ORGANOCATALYST KITS - Buchwald Palladacycle Precatalyst Kit 2a

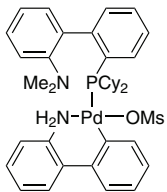
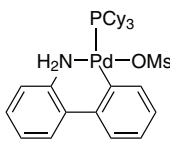
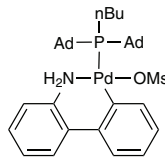
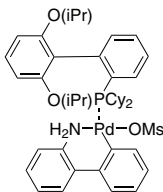
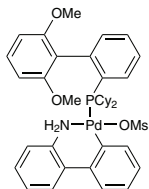
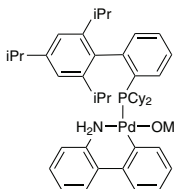
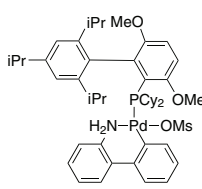
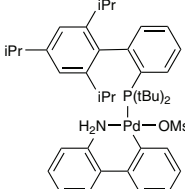
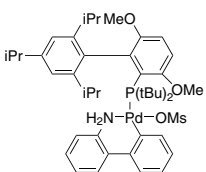
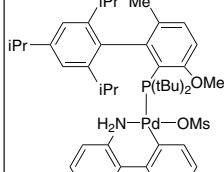
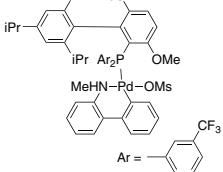
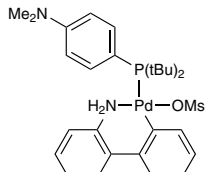
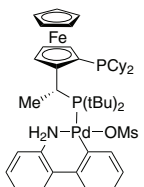
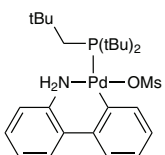
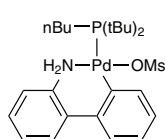
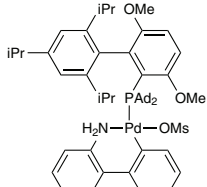
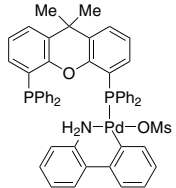
96-5505

Buchwald Palladacycle Precatalyst Kit 2a

(Methanesulfonato-2'-amino-1,1'-biphenyl-2-yl- Palladacycles Gen. 3)

Patents: US 6,395,916, US 6,307,087.

Components also available for individual sale. Contains the following:

 46-0237 DavePhos 250mg	 46-0239 PCy3 250mg	 46-0278 cataCXium® A 250mg	 46-0314 RuPhos 250mg
 46-0318 SPhos 250mg	 46-0320 XPhos 250mg	 46-0322 BrettPhos 100mg	 46-0323 t-BuXPhos 250mg
 46-0325 t-BuBrettPhos 100mg	 46-0335 RockPhos 100mg	 46-0340 JackiePhos 100mg	 46-0345 Amphos 250mg
 46-0353 Josiphos 100mg	 46-0358 DTBNpP 250mg	 46-0365 P(t-Bu)2(n-Bu) 250mg	 46-0480 AdBrettPhos 50mg
 46-0957 Xantphos 500mg			

CATALYST & ORGANOCATALYST KITS - Buchwald Palladacycle Precatalyst Kit 2b

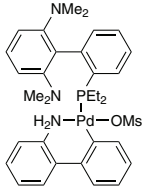
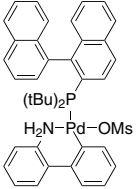
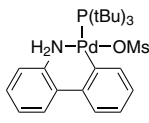
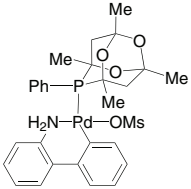
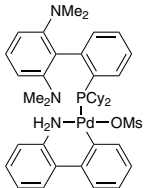
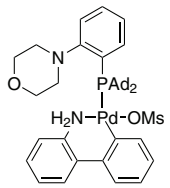
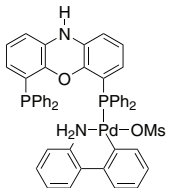
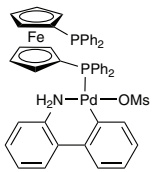
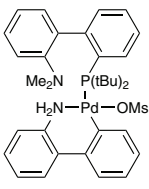
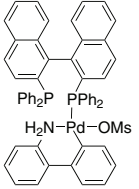
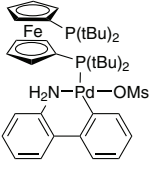
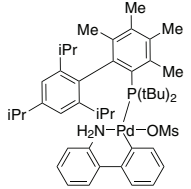
96-5506

Buchwald Palladacycle Precatalyst Kit 2b

(Methanesulfonato-2'-amino-1,1'-biphenyl-2-yl- Palladacycles Gen. 3)

Patents: US 6,395,916, US 6,307,087.

Components also available for individual sale. Contains the following:

 46-0348 EtCPhos 50mg	 46-0357 TrixiePhos 100mg	 46-0387 P(t-Bu)₃ 250mg	 46-0392 MeCgPPh 500mg
 46-0487 CPhos 100mg	 46-0935 Mor-DalPhos 250mg	 46-0959 NiXantphos 100mg	 46-2128 DPPF 250mg
 46-2135 t-BuDavePhos 250mg	 46-2153 BINAP 250mg	 46-2158 DTBPF 250mg	 46-2163 Me₃ t-ButylXPhos 100mg

CATALYST & ORGANOCATALYST KITS - Buchwald Palladacycle Precatalyst Kit 4

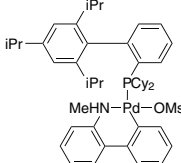
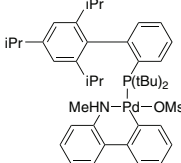
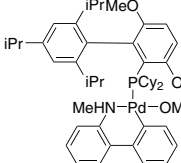
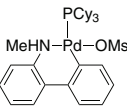
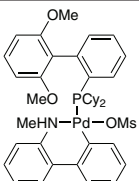
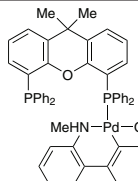
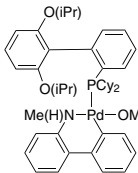
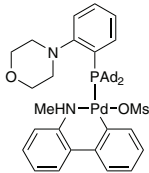
96-5512

Buchwald Palladacycle Precatalyst Kit 4

(Methanesulfonato-2'-methylamino-1,1'-biphenyl-2-yl)- Palladacycles Gen. 4)

Patents: PCT/US2013/030779, US Serial No. 13/799620

Components also available for individual sale. Contains the following:

 46-0327 XPhos 250mg	 46-0330 t-BuXPhos 250mg	 46-0333 BrettPhos 250mg	 46-0379 PCy₃ 250mg
 46-0380 SPhos 250mg	 46-0385 P(t-Bu)₃ 250mg	 46-0388 Xantphos 250mg	 46-0395 RuPhos 250mg
 46-0940 MorDalphos 250mg			

CATALYST & ORGANOCATALYST KITS - CATHY™ Catalyst Kit

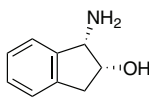
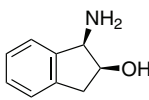
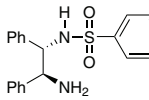
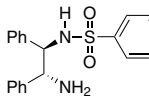
96-7650

CATHY™ Catalyst Kit for Asymmetric Transfer Hydrogenation of Ketones and Imines

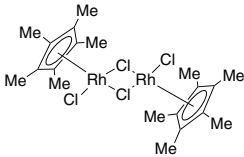
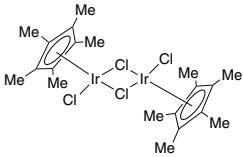
For asymmetric transfer hydrogenation of ketones and imines.

Components also available for individual sale. Contains the following:

Chiral Bidentate Nitrogen Ligands

 07-0200 1g	 07-0201 1g	 07-2370 500mg	 07-2371 500mg
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Rhodium & Iridium Components

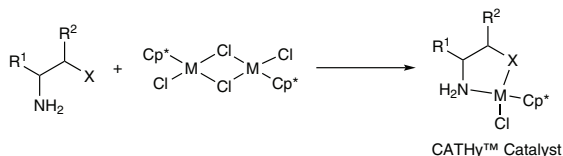
 45-0195 500mg	 77-1060 500mg
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CATALYST & ORGANOCATALYST KITS - CATHy™ Catalyst Kit

96-7650
(continued)

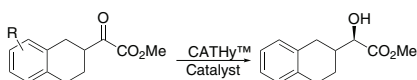
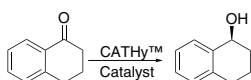
CATHy™ Catalyst Kit for Asymmetric Transfer Hydrogenation of Ketones and Imines

Catalyst Preparation

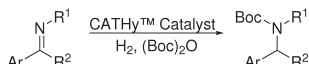
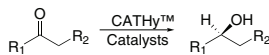
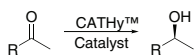


Technical Notes:

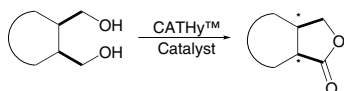
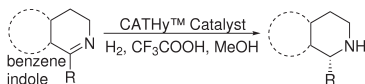
1. Catalyst for asymmetric ketone reduction in organic and aqueous media
2. Catalyst for asymmetric imine reduction in organic and aqueous media
3. Catalyst for asymmetric oxidative lactonizations of meso-diols
4. Catalyst for asymmetric transfer hydrogenation of quinolines



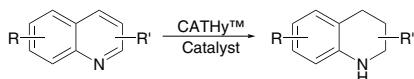
Tech. Note (1)
Ref. (1-7)



Tech. Note (2)
Ref. (1, 8-10)



Tech. Note (3)
Ref. (11)



Tech. Note (4)
Ref. (12-13)

References:

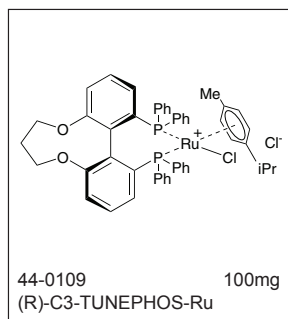
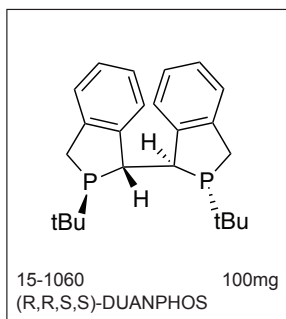
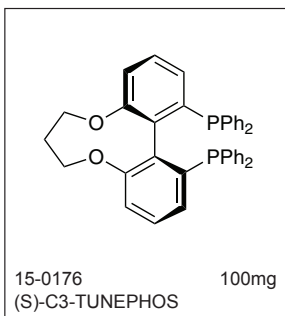
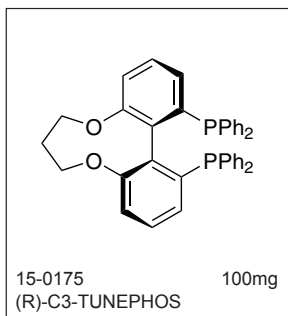
1. Blacker A.J., Mellor B.J. WO9842643A1, filed 26/03/97, Avecia Ltd.; Blacker A.J. Conf. Proceedings: The Scale up of Chemical Processes. Jersey 1998 ISBN 0953399400;
2. *Tetrahedron*, **2006**, 62, 1864
3. *Org. Lett.*, **2007**, 9, 2565
4. *Chem. Eur. J.* **2008**, 14, 2209
5. *J. Org. Chem.* **2010**, 75, 2981
6. *J. Org. Chem.* **2015**, 80, 4419
7. *J. Organometal. Chem.* **2016**, 810, 12
8. *Chem. Eur. J.* **2011**, 17, 1109
9. *Org. Lett.* **2015**, 17, 2878
10. *Chem. Commun.*, **2016**, 52, 362
11. *Organometallics* **2002**, 21, 3493
12. *Org. Lett.*, **2008**, 10, 5265
13. *Angew. Chem. Int. Ed.* **2009**, 48, 6524

CATALYST & ORGANOCATALYST KITS - Chiral Quest Catalyst & Ligand Toolbox Kit

96-5900

Chiral Quest Catalyst and Ligand Toolbox Kit for Asymmetric Hydrogenation

Components also available for individual sale. Contains the following:



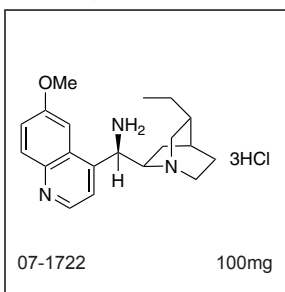
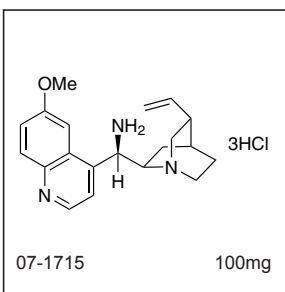
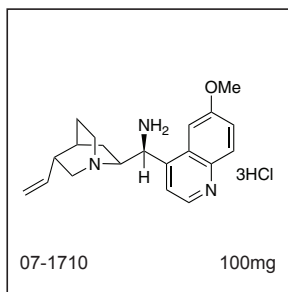
CATALYST & ORGANOCATALYST KITS - Cinchona Alkaloid-Derived Organocatalyst Kit

96-1575

Cinchona Alkaloid-Derived Organocatalyst Kit

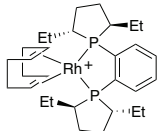
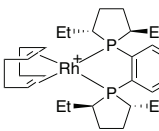
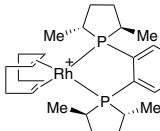
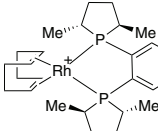
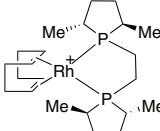
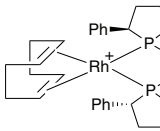
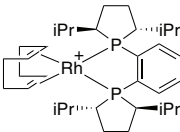
(enantiopure primary amines) for Iminium-Enamine Activation

Components also available for individual sale. Contains the following:



CATALYST & ORGANOCATALYST KITS - (R,R)-DuPhos & BPE Rhodium Catalyst Kit

96-4730 (R,R)-Duphos and BPE Rhodium Catalyst Kit for Asymmetric Hydrogenation
Components also available for individual sale. Contains the following:

 45-0148 100mg (R,R)-Et-DUPHOS-Rh	 45-0150 100mg (R,R)-Et-DUPHOS-Rh	 45-0158 100mg (R,R)-Me-DUPHOS-Rh
 45-0160 100mg (R,R)-Me-DUPHOS-Rh	 45-0168 100mg (R,R)-Me-BPE-Rh	 45-0201 100mg (R,R)-Ph-BPE-Rh
 45-0210 100mg (R,R)-i-Pr-DUPHOS-Rh		

CATALYST & ORGANOCATALYST KITS - (S,S)-DuPhos & BPE Rhodium Catalyst Kit

96-4731 (S,S)-Duphos and BPE Rhodium Catalyst Kit for Asymmetric Hydrogenation
Components also available for individual sale. Contains the following:

45-0149	(+)-1,2-Bis((2S,5S)-2,5-diethylphospholano)benzene(1,5-cyclooctadiene) rhodium(I) tetrafluoroborate, 98+% (S,S)-Et-DUPHOS-Rh (213343-64-7)	100mg
45-0151	(+)-1,2-Bis((2S,5S)-2,5-diethylphospholano)benzene(1,5-cyclooctadiene) rhodium(I) trifluoromethanesulfonate, 98+% (S,S)-Et-DUPHOS-Rh (142184-30-3)	100mg
45-0159	(+)-1,2-Bis((2S,5S)-2,5-dimethylphospholano)benzene(1,5-cyclooctadiene) rhodium(I) tetrafluoroborate, 98+% (S,S)-Me-DUPHOS-Rh (205064-10-4)	100mg
45-0161	(+)-1,2-Bis((2S,5S)-2,5-dimethylphospholano)benzene(1,5-cyclooctadiene) rhodium(I)trifluoromethanesulfonate, 98+% (S,S)-Me-DUPHOS-Rh (136705-75-4)	100mg
45-0169	(-)-1,2-Bis((2S,5S)-2,5-dimethylphospholano)ethane(1,5-cyclooctadiene) rhodium(I) tetrafluoroborate, 98+% (S,S)-Me-BPE-Rh (213343-65-8)	100mg
45-0202	(+)-1,2-Bis((2S,5S)-2,5-diphenylphospholano)ethane(1,5-cyclooctadiene) rhodium(I) tetrafluoroborate, min. 98% (S,S)-Ph-BPE-Rh (849950-53-4)	100mg
45-0211	(-)-1,2-Bis((2S,5S)-2,5-di-i-propylphospholano)benzene(1,5-cyclooctadiene) rhodium(I) tetrafluoroborate, min. 98% (S,S)-i-Pr-DUPHOS-Rh	100mg

CATALYST & ORGANOCATALYST KITS - Enantiotech BIMA Ru BINAP Catalyst Kit

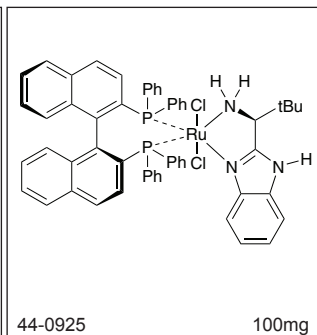
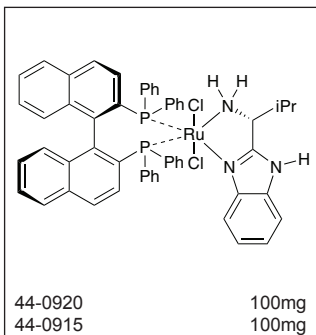
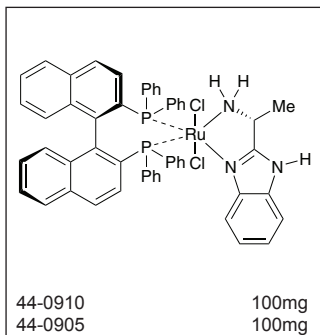
96-3705

Enantiotech BIMA Ru BINAP Catalyst Kit for Asymmetric Hydrogenation

Sold under license from Enantiotech for research purposes.

PCT/CN2008/073648, CN 200810038929.

Components also available for individual sale. Contains the following:



CATALYST & ORGANOCATALYST KITS - Enantiotech BIMA Ru DIOP Catalyst Kit

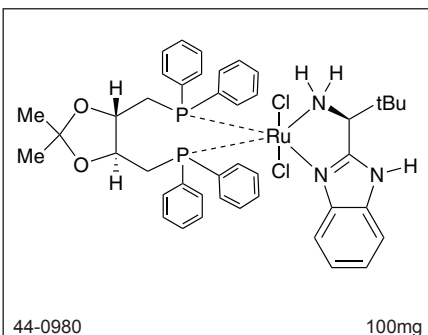
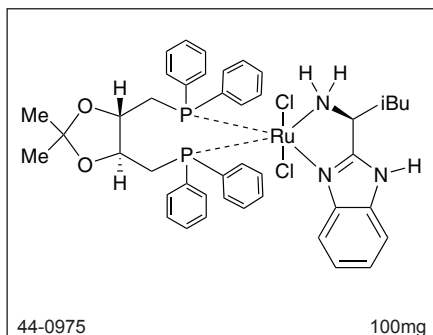
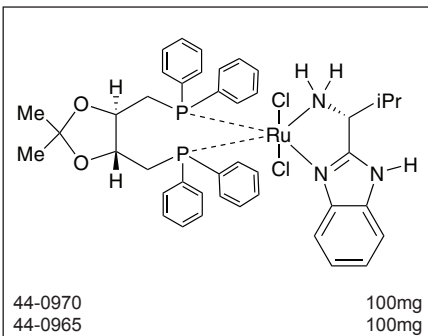
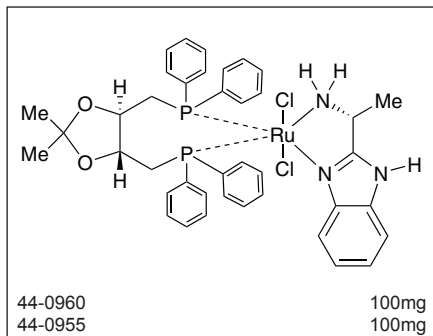
96-3715

Enantiotech BIMA Ru DIOP Catalyst Kit for Asymmetric Hydrogenation

Sold under license from Enantiotech for research purposes only.

PCT/CN2008/073648, CN 200810038929.

Components also available for individual sale. Contains the following:



CATALYST & ORGANOCATALYST KITS - Enantitech BIMAH Ru Tol-BINAP Catalyst Kit

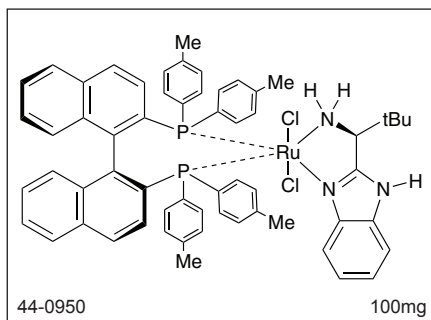
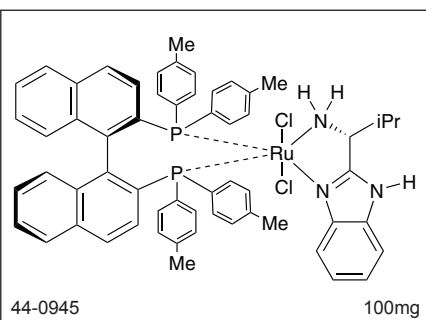
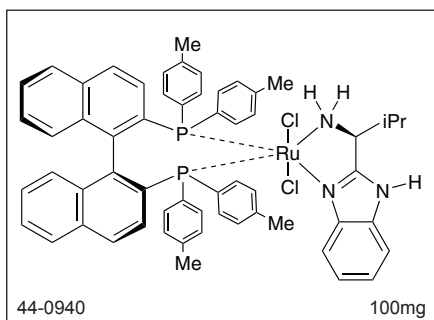
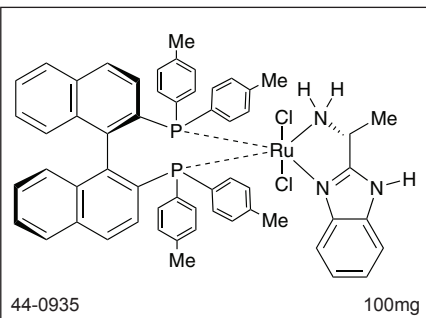
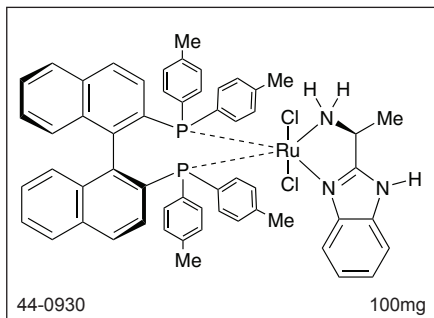
96-3710

Enantitech BIMAH Ru Tol-BINAP Catalyst Kit for Asymmetric Hydrogenation

Sold under license from Enantitech for research purposes only.

PCT/CN2008/073648, CN 200810038929.

Components also available for individual sale. Contains the following:



CATALYST & ORGANOCATALYST KITS - Evonik Heterogeneous Catalyst Kit

96-6670

Evonik Heterogeneous Catalyst Kit

Sold in collaboration with Evonik for research purposes only.
Components also available for individual sale. Contains the following:

44-4060	Ruthenium, 5% on activated carbon, (50-70% wetted powder) Evonik Noblyst® P3060 (7440-18-8)	10g
45-1863	Rhodium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P3053 (7440-16-6)	10g
46-1703	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1086 (7440-05-3)	10g
46-1706	Palladium, 10% on activated carbon, Pearlman (50-70% wetted powder) Evonik Noblyst® P1070 (7440-05-3)	10g
46-1740	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1090 (7440-05-3)	10g
46-1743	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1093 (7440-05-3)	10g
46-1747	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1092 (7440-05-3)	10g
46-1750	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1109 (7440-05-3)	10g
78-1530	Platinum, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P2058 (7440-06-4)	10g
78-1534	Platinum, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P2060 (7440-06-4)	10g
78-1536	Platinum 1% and vanadium 2%, on activated carbon (50-70% wetted powder) Evonik Noblyst® P8078 (7440-06-4)	10g
78-1540	Platinum, 3% on activated carbon, sulfided (50-70% wetted powder) Evonik Noblyst® P2065 (7440-06-4)	10g

CATALYST & ORGANOCATALYST KITS - Evonik Heterogeneous Catalyst Kit for Selective Hydrogenation

96-6674

Evonik Heterogeneous Catalyst Kit for Selective Hydrogenation

Sold in collaboration with Evonik for research purposes only.
Components also available for individual sale. Contains the following:

44-4060	Ruthenium, 5% on activated carbon, (50-70% wetted powder) Evonik Noblyst® P3060 (7440-18-8)	10g
45-1863	Rhodium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P3053 (7440-16-6)	10g
78-1530	Platinum, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P2058 (7440-06-4)	10g
78-1534	Platinum, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P2060 (7440-06-4)	10g
78-1536	Platinum 1% and vanadium 2%, on activated carbon (50-70% wetted powder) Evonik Noblyst® P8078 (7440-06-4)	10g
78-1540	Platinum, 3% on activated carbon, sulfided (50-70% wetted powder) Evonik Noblyst® P2065 (7440-06-4)	10g

CATALYST & ORGANOCATALYST KITS - Evonik Heterogeneous Palladium Catalyst Kit

96-6672

Evonik Heterogeneous Palladium Catalyst Kit

Sold in collaboration with Evonik for research purposes only.
Components also available for individual sale. Contains the following:

46-1703	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1086 (7440-05-3)	10g
46-1706	Palladium, 10% on activated carbon, Pearlman (50-70% wetted powder) Evonik Noblyst® P1070 (7440-05-3)	10g
46-1740	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1090 (7440-05-3)	10g
46-1743	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1093 (7440-05-3)	10g
46-1747	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1092 (7440-05-3)	10g
46-1750	Palladium, 5% on activated carbon (50-70% wetted powder) Evonik Noblyst® P1109 (7440-05-3)	10g

CATALYST & ORGANOCATALYST KITS - Evonik Heterogeneous Catalyst Kits

Application Chart

Kits 96-6670, 96-6672 & 96-6674 sold in collaboration with Evonik for research purposes only.

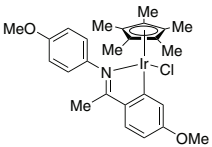
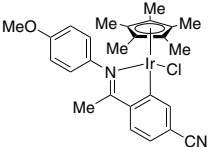
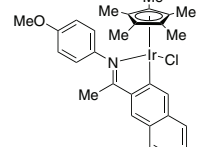
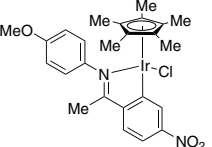
96-6670 - Heterogeneous Catalyst Kit												
Strem Item #	96-6672 - Palladium Catalyst Kit						96-6674 - Selective Hydrogenation Kit					
	46-1706	46-1703	46-1740	46-1747	46-1743	46-1750	78-1530	78-1534	78-1540	45-1863	44-4060	78-1536
Evonik Item #	E 101 NE/W	E 101 R/W	E 105 N/W	E 105 NNW	E 105 OW	E 107 MA/	F 1015 RE/W	F 105 N/W	F 1082 QHA/W	G 106 N/W	H 198 P/W	CF 1082 B/W
Nobylis® nomenclature Application/ Catalyst	Nobylis® P 1070 10% Pd	Nobylis® P 1086 5% Pd	Nobylis® P 1090 5% Pd	Nobylis® P 1092 5% Pd	Nobylis® P 1093 5% Pd	Nobylis® P 1109 5% Pd	Nobylis® P 2058 5% Pt	Nobylis® P 2060 5% Pt	Nobylis® P 2065 3% Pt	Nobylis® P 3053 5% Rh	Nobylis® P 3060 5% Ru	Nobylis® P 8078 1% Pt
Hydrogenation of C=C Double Bonds		●		○	●	○						
Hydrogenation of CN Bonds	○		○	●		●	○	●		●		
Reduction of the C=O Group		○		●	○	●				●		
Hydrogenation of Nitro Groups	●	●		●	○	○	●	○	○		●	●
Hydrogenolysis Reactions (Deprotections, Dehalogenations, etc.)	○		●	●		○						
Reductive Alkylation and Amination		●	○	○	●				●			
Hydrogenation of (Hetero) Aromatic Rings		●	○	●	○		○	○		●	●	
Oxidations (Alcohols and Sugars)								●				
CC Coupling Reactions	○			●	●	○						
											○ recommended ● preferred	
Note: Please refer to the different reaction classes in the Evonik manual for more detailed information regarding selectivity, activity and reaction conditions. This sample kit is designed as an entry point to find a suitable catalyst. Please contact one of our technical specialists for further recommendations. Most often the catalyst performance can be improved significantly by tailoring the catalyst to your requirements.												
The recommendations given above are believed to be accurate at the time of publication but EVONIK makes no warranty with respect thereto, including but not limited to any results to be obtained or the infringement of any proprietary right.												

CATALYST & ORGANOCATALYST KITS - Iridicycle Catalyst Kit

96-3745

Iridicycle Catalyst Kit

Sold in collaboration with Yorkshire Process Technology for research purposes only.
Developed by Prof. J. Xiao, Liverpool University. Patents GB 1206572.8 and GB 1206573.6
Components also available for individual sale. Contains the following:

 77-0418 100mg Iridicycle-MeO	 77-0424 100mg Iridicycle-CN	 77-0428 100mg Iridicycle-Naphth	 77-0430 100mg Iridicycle-NO₂
--	--	--	---

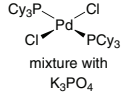
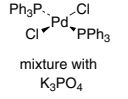
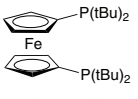
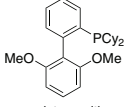
CATALYST & ORGANOCATALYST KITS - Kit of CatKits - Single-Use Vials

96-3790

Kit of CatKits - Single-Use Vials for Low Catalyst Loading Experiments

Components also available for individual sale. Contains the following:

46-2030	Palladium(II) acetate/1,1'-bis(di- <i>t</i> -butylphosphino)ferrocene/potassium phosphate admixture [CatKit single-use vials - 2.02 wt% Pd(OAc) ₂]	5 x 1vial
46-2033	Palladium(II) acetate/2-dicyclohexylphosphino-2,6-dimethoxy-1,1'-biphenyl (SPhos)/potassium phosphate admixture [CatKit single-use vials - 1.96 wt% Pd(OAc) ₂]	5 x 1vial
46-2038	trans-Dichlorobis(triphenylphosphine)palladium(II)/potassium phosphate admixture [CatKit single-use vials - 6.32 wt% Pd complex] (13965-03-2)	5 x 1vial
46-2040	trans-Dichlorobis(tricyclohexylphosphine)palladium(II)/potassium phosphate admixture [CatKit single-use vials - 6.62 wt% Pd complex] (29934-17-6)	5 x 1vial

Components	46-2040	46-2038	46-2030	46-2033
Metal Precursor	 mixture with K₃PO₄	 mixture with K₃PO₄	Pd(OAc) ₂	Pd(OAc) ₂
Ligand	---	---	 mixture with Pd(OAc)₂/K₃PO₄	 mixture with Pd(OAc)₂/K₃PO₄
Base	K ₃ PO ₄	K ₃ PO ₄	K ₃ PO ₄	K ₃ PO ₄

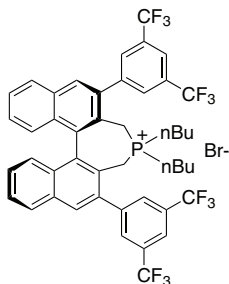
This Kit contains 4 different types of Single-Use Vials. Each type has 5 x 1 vials.

CATALYST & ORGANOCATALYST KITS - Maruoka Chiral Phase-Transfer Phosphonium Organocatalyst Kit

96-3750

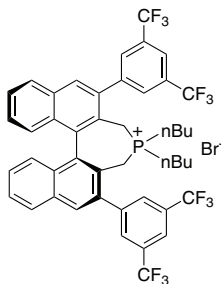
Maruoka Chiral Phase-Transfer Phosphonium Organocatalyst Kit

Components also available for individual sale. Contains the following:



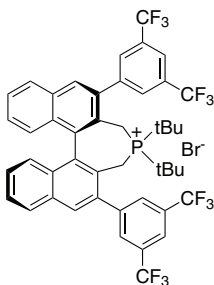
15-1457
R-MARUOKA CAT P-NB

50mg



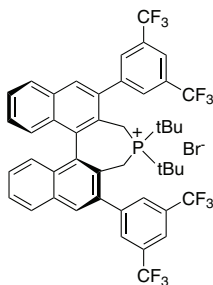
15-1458
S-MARUOKA CAT P-NB

50mg



15-1464
R-MARUOKA CAT P-TB

50mg



15-1465
S-MARUOKA CAT P-TB

50mg

CATALYST & ORGANOCATALYST KITS - Palladium Kit

96-4650

Palladium Kit

For a variety of catalytic organic transformations.

Components also available for individual sale. Contains the following:

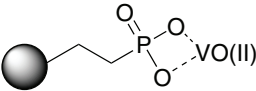
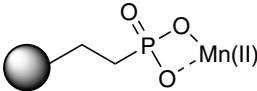
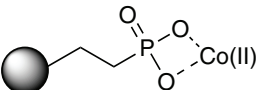
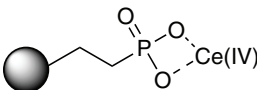
46-0100	Allylpalladium chloride dimer, min. 98% (12012-95-2)	500mg
46-0400	Dichlorobis(benzonitrile)palladium(II), 99% (14220-64-5)	1g
46-1780	Palladium(II) acetate, min. 98% (99.9+%-Pd) (3375-31-3)	1g
46-1850	Palladium(II) chloride (99.9%-Pd) (7647-10-1)	1g
46-2150	Tetrakis(triphenylphosphine)palladium(0), 99% (99.9+%-Pd) (14221-01-3)	5g
46-3000	Tris(dibenzylideneacetone)dipalladium(0) (51364-51-3)	5g
46-3010	Tris(dibenzylideneacetone)dipalladium(0) chloroform adduct (52522-40-4)	500mg

CATALYST & ORGANOCATALYST KITS - PhosphonicS Metal Oxidation Catalyst Kit

96-6770

PhosphonicS Metal Oxidation Catalyst Kit

Sold in collaboration with PhosphonicS Ltd. for research purposes only.
Components also available for individual sale. Contains the following:

 23-4380 PhosphonicS POVO 5g	 25-1200 PhosphonicS POMn 5g
 27-0900 PhosphonicS POCO 5g	 58-5100 PhosphonicS POCe 5g

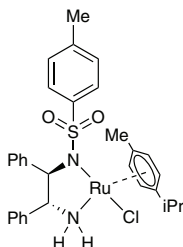
Reactions such as allylic and benzylic oxidations, alcohol oxidations and epoxidations are key chemical transformations in organic synthesis. In general these reactions are conducted by the use of stoichiometric, or even higher concentrations, of inorganic oxidants. Typical oxidizing agents include potassium permanganate, manganese dioxide, chromium trioxide, potassium chromate, potassium dichromate and peracids. These hazardous reagents produce large volumes of toxic wastes that are becoming increasingly costly to treat and dispose. In addition, difficulties are often encountered in the work up of reactions and purification of the products. There is a need for new heterogeneous oxidation catalysts that are not only effective, but exhibit ease of recovery and recyclability. PhosphonicS has developed a number of novel heterogeneous oxidation catalysts for a wide range of applications in the pharmaceutical, fine chemicals and petrochemical industries. Reactions include allylic and benzylic oxidations, epoxidations and the selective oxidations of alcohols to ketones and sulfides to sulfoxides.

CATALYST & ORGANOCATALYST KITS - Takasago ATH Catalyst Kit

Takasago ATH (Asymmetric Transfer Hydrogenation) Catalyst Kit

Sold in collaboration with Takasago.

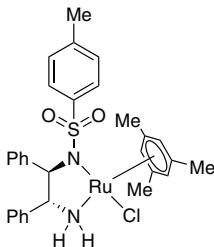
Components also available for individual sale. Contains the following:



44-0148 250mg

RuCl[(R,R)-Tsdpen](p-cymene)

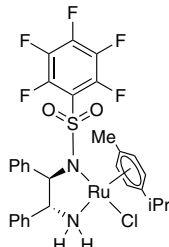
44-0149
RuCl[(S,S)-Tsdpen](p-cymene)



44-0154 250mg

RuCl[(R,R)-Tsdpen(mesitylene)]

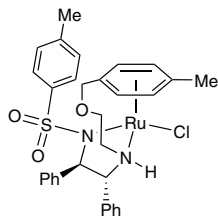
44-0155
RuCl[(S,S)-Tsdpen(mesitylene)]



44-0156 250mg

RuCl[(R,R)-Fsdpen](p-cymene)

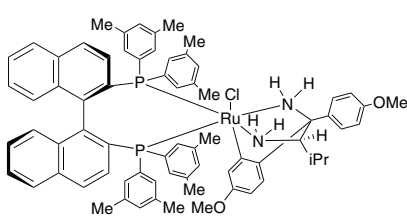
44-0157
RuCl[(S,S)-Fsdpen](p-cymene)



44-0185 250mg

(R,R)-Ts-DENEB®

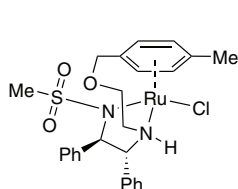
44-0186
(S,S)-Ts-DENEB®



44-0217 250mg

(R)-RUCY®XyIBINAP

44-0218
(S)-RUCY®XylBINAP



44-0255 250mg

(R,R)-Ms-DENEB®

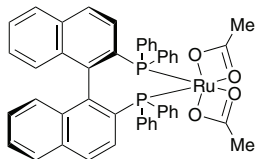
44-0256
(S,S)-Ms-DENEB®

CATALYST & ORGANOCATALYST KITS - Takasago BINAP Ru Acetate Catalyst Kit

Takasago BINAP Ru Acetate Catalyst Kit

Sold in collaboration with Takasago.

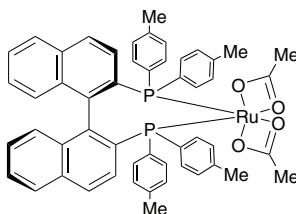
Components also available for individual sale. Contains the following:



44-0152 250mg

$$\text{Ru}(\text{OAc})_2[(R)\text{-binap}]$$

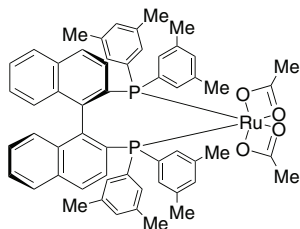
44-0153
Ru(OAc)₂[(S)-binap]



44-0162 250mg

Ru(OAc)₂[(R)-tolbinap]

44-0163
Ru(OAc)₂[(S)-tolbinap]



44-0164 250mg

$$\text{Ru}(\text{OAc})_2[(R)\text{-xylbinap}]$$

44-0165
Ru(OAc)₂[(S)-xylbinap]

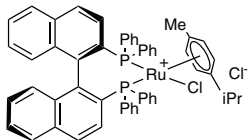
CATALYST & ORGANOCATALYST KITS - Takasago BINAP Ru Cymene Catalyst Kit

96-6951

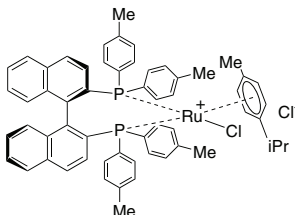
Takasago BINAP Ru Cymene Catalyst Kit

Sold in collaboration with Takasago.

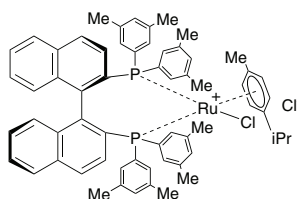
Components also available for individual sale. Contains the following:



44-0084 250mg
[RuCl(p-cymene)((R)-binap)]Cl
44-0086
[RuCl(p-cymene)((S)-binap)]Cl



44-0088 250mg
[RuCl(p-cymene)((R)-tolbinap)]Cl
44-0089
[RuCl(p-cymene)((S)-tolbinap)]Cl



44-0092 250mg
[RuCl(p-cymene)((R)-xylbinap)]Cl
44-0093
[RuCl(p-cymene)((S)-xylbinap)]Cl

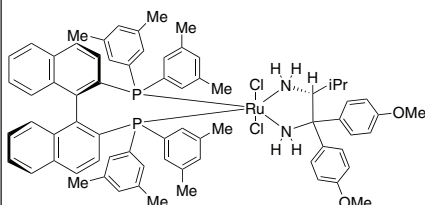
CATALYST & ORGANOCATALYST KITS - Takasago BINAP Ru Diamine Catalyst Kit

96-6954

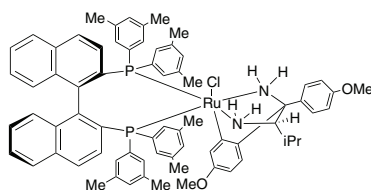
Takasago BINAP Ru Diamine Catalyst Kit

Sold in collaboration with Takasago.

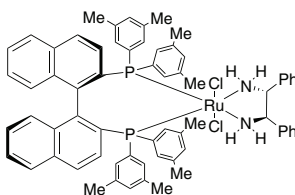
Components also available for individual sale. Contains the following:



44-0212 250mg
RuCl₂[(R)-xylbinap][(R)-daipen]
44-0213
RuCl₂[(S)-xylbinap][(S)-daipen]



44-0217 250mg
(R)-RUCY®XylBINAP
44-0218
(S)-RUCY®XylBINAP



44-0226 250mg
RuCl₂[(R)-xylbinap][(R,R)-dpen]
44-0224
RuCl₂[(S)-xylbinap][(S,S)-dpen]

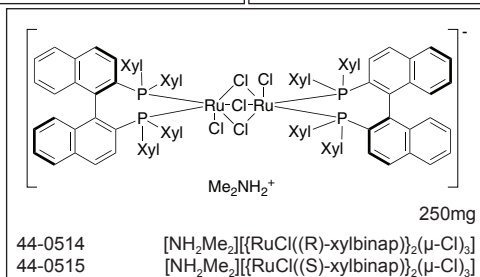
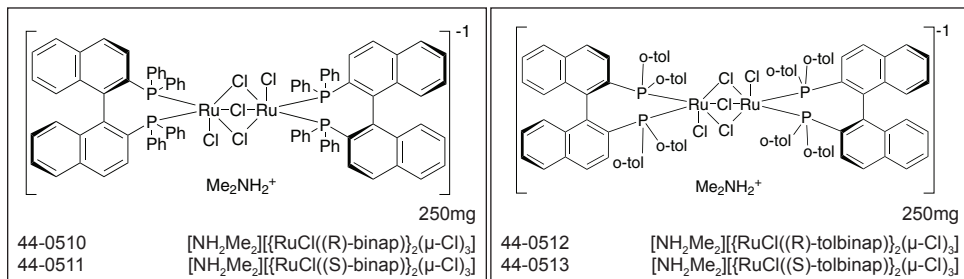
CATALYST & ORGANOCATALYST KITS - Takasago BINAP Ru Dimer Catalyst Kit

96-6952

Takasago BINAP Ru Dimer Catalyst Kit

Sold in collaboration with Takasago.

Components also available for individual sale. Contains the following:



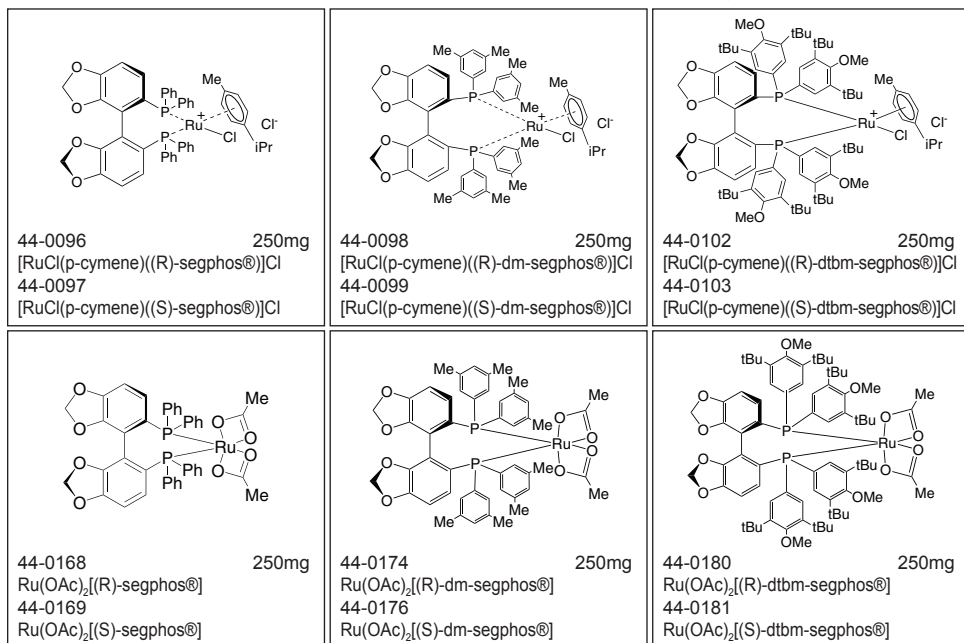
CATALYST & ORGANOCATALYST KITS - Takasago SEGPHOS® Ru Catalyst Kit

96-6901

Takasago SEGPHOS® Ru Catalyst Kit

Sold in collaboration with Takasago.

Components also available for individual sale. Contains the following:

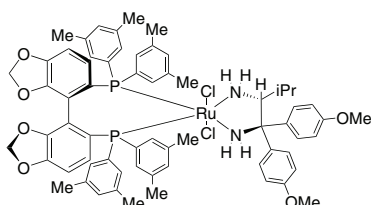


CATALYST & ORGANOCATALYST KITS - Takasago SEGPHOS® Ru Catalyst Kit

96-6901

Takasago SEGPHOS® Ru Catalyst Kit

(continued)



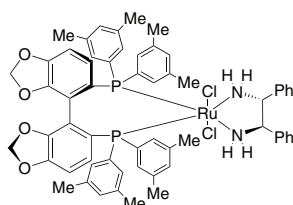
44-0214

RuCl₂[(R)-dm-segphos][(R)-daipen]

44-0215

RuCl₂[(S)-dm-segphos][(S)-daipen]

250mg



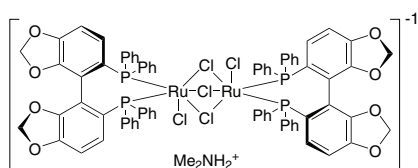
44-0228

RuCl₂[(R)-dm-segphos][(R,R)-dppe]

44-0229

RuCl₂[(S)-dm-segphos][(S,S)-dppe]

250mg



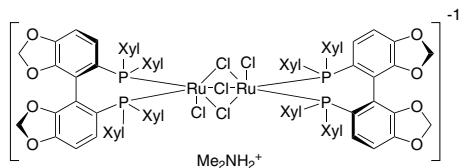
44-0518

[NH₂Me₂][{RuCl((R)-segphos)}₂(μ-Cl)₃]

44-0519

[NH₂Me₂][{RuCl((S)-segphos)}₂(μ-Cl)₃]

250mg



44-0520

[NH₂Me₂][{RuCl((R)-dm-segphos)}₂(μ-Cl)₃]

44-0521

[NH₂Me₂][{RuCl((S)-dm-segphos)}₂(μ-Cl)₃]

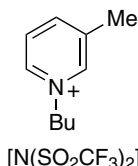
250mg

IONIC LIQUID KITS - Ionic Liquid Kit 1: Hydrophobic (water-immiscible) Kit

96-6500

Ionic Liquid Kit 1: Hydrophobic (water-immiscible) Kit

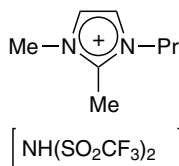
Components also available for individual sale. Contains the following:



07-0180

[BMPIm]

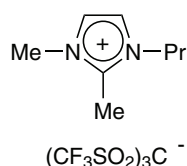
1g



07-0465

[DMPIm]

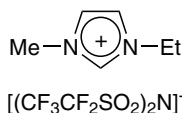
1g



07-0470

[DMPIm]

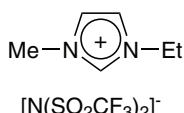
500mg



07-0578

[EMI]

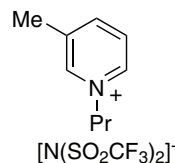
500mg



07-0579

[EMI]

1g



07-1775

[PMPIm]

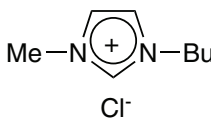
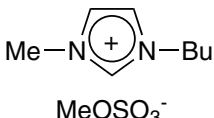
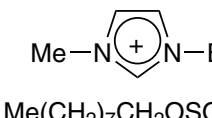
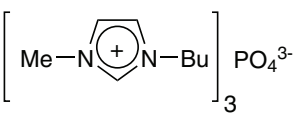
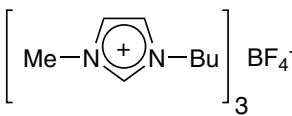
1g

IONIC LIQUID KITS - Ionic Liquid Kit 2: BMIM Kit

96-6510

Ionic Liquid Kit 2: BMIM Kit

Components also available for individual sale. Contains the following:

 Me-N⁺(Me)-N-Bu Cl⁻ 07-0100 [BMIM]Cl 10g	 Me-N⁺(Me)-N-Bu MeOSO₃⁻ 07-0140 [BMIM] [MeSO₄] 5g	 Me-N⁺(Me)-N-Bu Me(CH₂)₇CH₂OSO₃⁻ 07-0150 [BMIM] [OctSO₄] 5g
 [Me-N⁺(Me)-N-Bu]₃ PO₄³⁻ 07-0160 [BMIM]₃ [PO₄] 5g	 [Me-N⁺(Me)-N-Bu]₃ BF₄⁻ 07-0170 [BMIM] [BF₄] 5g	

IONIC LIQUID KITS - Ionic Liquid Kit 3: CYPHOS® IL Phosphonium Salt Kit

96-6520

Ionic Liquid Kit 3: CYPHOS® IL Phosphonium Salt Kit

Components also available for individual sale. Contains the following:

15-6370	Trihexyl(tetradecyl)phosphonium bis(trifluoromethanesulfonyl)amide, min. 97% CYPHOS® IL 109 (460092-03-9)	10g
15-6374	Trihexyl(tetradecyl)phosphonium bis(2,4,4-trimethylpentyl)phosphinate, min. 95% CYPHOS® IL 104 (465527-59-7)	10g
15-6378	Trihexyl(tetradecyl)phosphonium bromide, min. 95% CYPHOS® IL 102 (654057-97-3)	10g
15-6382	Trihexyl(tetradecyl)phosphonium chloride, min. 93% CYPHOS® IL 101 (258864-54-9)	10g
15-6386	Trihexyl(tetradecyl)phosphonium decanoate, min. 95% CYPHOS® IL 103 (465527-65-5)	10g
15-6390	Trihexyl(tetradecyl)phosphonium dicyanamide, min. 93% CYPHOS® IL 105	10g
15-6394	Trihexyl(tetradecyl)phosphonium hexafluorophosphate, min. 98% CYPHOS® IL 110 (374683-44-0)	10g

CYPHOS® IL Registered trademark of Cytec.

References:

1. The Strem Chemiker, Vol. XX, No. 1, 2003 for technical note.

LIGAND KITS - AntPhos and WingPhos Kit

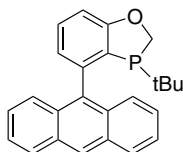
96-3810

AntPhos and WingPhos Kit

Sold in collaboration with Zejun for research purposes only.

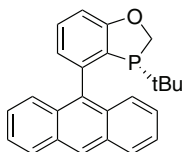
Patents ZL201310020371.1, CN 201610056390.

Components also available for individual sale. Contains the following:



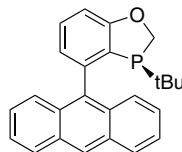
15-1960
rac-AntPhos

25mg



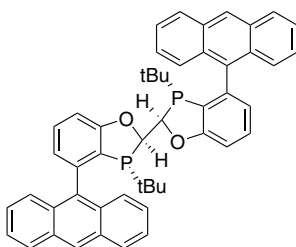
15-1963
[(R)-AntPhos]

25mg



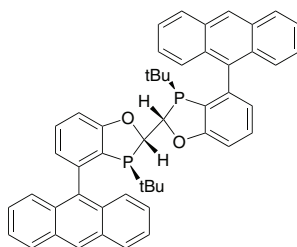
15-1967
[(S)-AntPhos]

25mg



15-1970
[(2R,2'R,3R,3'R)-WingPhos]

25mg



15-1975
[(2S,2'S,3S,3'S)-WingPhos]

25mg

LIGAND KITS - BABIBOP Ligand Kit

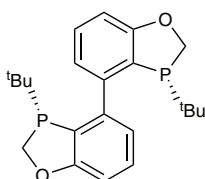
96-0660

BABIBOP Ligand Kit

Sold under license from Zejun for research purposes only.

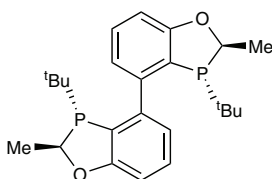
Patents: CN 107827929 A 20180323; US 20180155375 A1 20180607.

Components also available for individual sale. Contains the following:



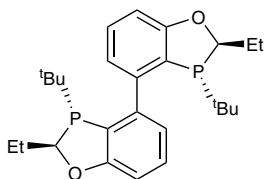
15-6415
(3R,3'R)-BABIBOP
15-6410
(3S,3'S)-BABIBOP

25mg



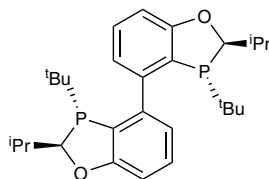
15-6435
(2R,2'R,3R,3'R)-DI-Me-BABIBOP
15-6420
(2S,2'S,3S,3'S)-DI-Me-BABIBOP

25mg



15-6440
(2R,2'R,3R,3'R)-DI-Et-BABIBOP
15-6425
(2S,2'S,3S,3'S)-DI-Et-BABIBOP

25mg



15-6445
(2R,2'R,3R,3'R)-DI-iPr-BABIBOP
15-6430
(2S,2'S,3S,3'S)-DI-iPr-BABIBOP

25mg

LIGAND KITS - BI-DIME Ligand Kit

96-0650

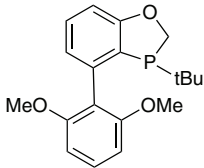
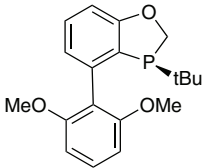
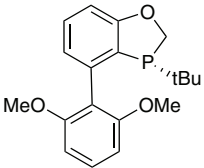
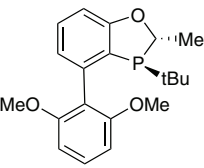
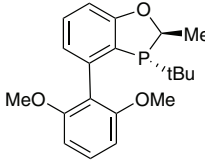
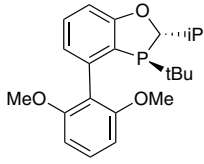
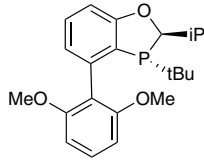
BI-DIME Ligand Kit

NEW

Sold in collaboration with Zejun for research purposes only.

Patents: ZL2013105048267, CN104558038.

Components also available for individual sale. Contains the following:

 15-6205 rac-BI-DIME 25mg	 15-6210 (S)-BI-DIME 25mg	 15-6211 (R)-BI-DIME 25mg	 15-6220 (S,S)-Me-BI-DIME 25mg
 15-6225 (R,R)-Me-BI-DIME 25mg	 15-6230 (S,S)-iPr-BI-DIME 25mg	 15-6235 (R,R)-iPr-BI-DIME 25mg	

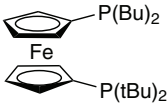
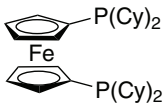
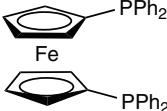
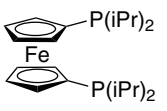
LIGAND KITS - 1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit

96-3730

1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit

Components also available for individual sale.

Contains the following:

 26-0150 DTBPF 500mg	 26-0155 500mg	 26-0270 DPPF 1g	 26-0275 DiPPF 500mg
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LIGAND KITS - Buchwald Biaryl Phosphine Ligand Master Kit

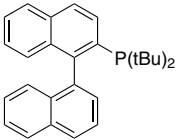
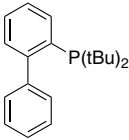
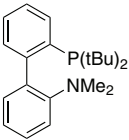
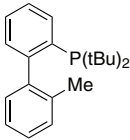
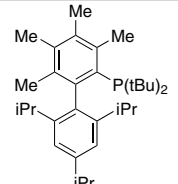
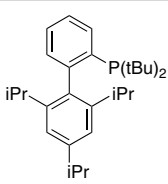
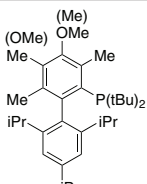
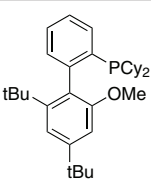
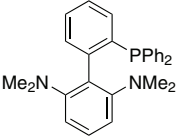
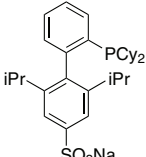
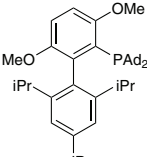
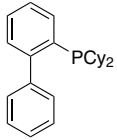
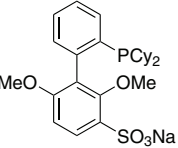
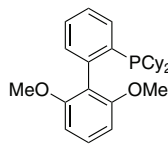
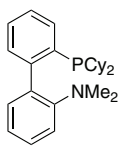
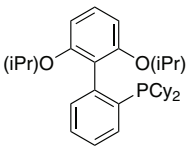
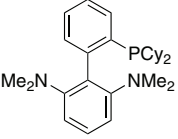
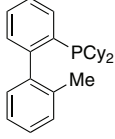
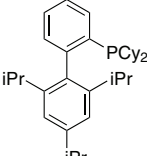
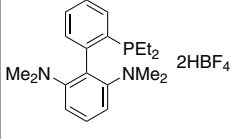
96-5500

Buchwald Biaryl Phosphine Ligand Master Kit for Aromatic Carbon-Heteroatom Bond Formation, Suzuki Coupling and Negishi Cross-coupling

For aromatic carbon-heteroatom bond formation and Suzuki Coupling.

Patents: US 6,395,916, US 6,307,087

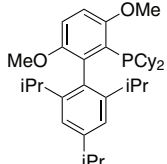
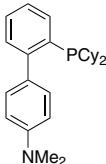
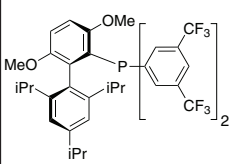
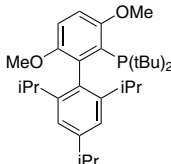
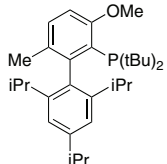
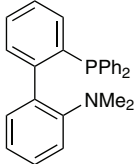
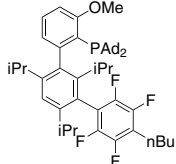
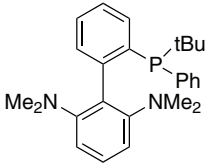
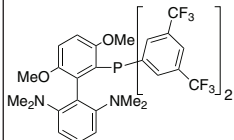
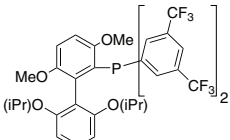
Components also available for individual sale. Contains the following:

 15-1043 TrixiePhos 250mg	 15-1045 JohnPhos 500mg	 15-1048 tBuDavePhos 500mg	 15-1049 t-BuMePhos 500mg
 15-1051 Me₄-t-BuXPhos 250mg	 15-1052 t-BuXPhos 500mg	 15-1063 250mg	 15-1105 VPhos 250mg
 15-1125 PhCPhos 100mg	 15-1135 XPhos-SO₃Na 100mg	 15-1138 AdBrettPhos 100mg	 15-1140 CyJohnPhos 1g
 15-1142 (water soluble SPhos) 500mg	 15-1143 SPhos 500mg	 15-1145 DavePhos 500mg	 15-1146 RuPhos 1g
 15-1147 CPhos 250mg	 15-1148 MePhos 500mg	 15-1149 XPhos 500mg	 15-1151 EtCPhos 100mg

LIGAND KITS - Buchwald Biaryl Phosphine Ligand Master Kit

96-5500
(continued)

Buchwald Biaryl Phosphine Ligand Master Kit for Aromatic Carbon-Heteroatom Bond Formation, Suzuki Coupling and Negishi Cross-coupling

 15-1152 BrettPhos 250mg	 15-1154 250mg	 15-1157 JackiePhos 100mg	 15-1164 t-BuBrettPhos 100mg
 15-1168 RockPhos 100mg	 15-1745 PhDavePhos 500mg	 15-2065 AlPhos 100mg	 15-3010 (t-Bu)PhCPhos 250mg
 15-3015 100mg	 15-3020 250mg		

LIGAND KITS - Buchwald Biaryl Phosphine Ligand Mini Kit 1

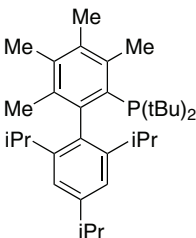
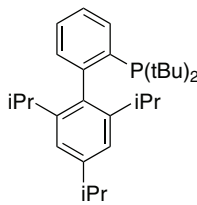
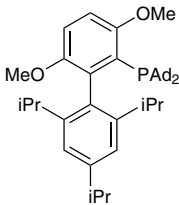
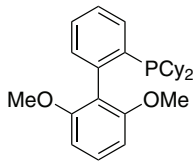
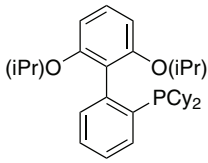
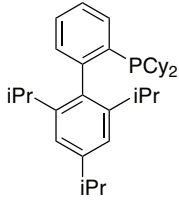
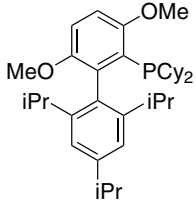
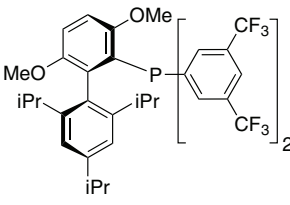
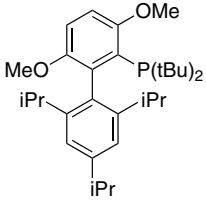
96-5485

Buchwald Biaryl Phosphine Ligand Mini Kit 1 for Aromatic Carbon-Heteroatom Bond Formation, Suzuki Coupling and Negishi Cross-coupling

For aromatic carbon-heteroatom bond formation and Suzuki Coupling.

Patents: US 6,395,916, US 6,307,087

Components also available for individual sale. Contains the following:

 15-1051 Me₄ t-BuXPhos 250mg	 15-1052 t-BuXPhos 500mg	 15-1138 AdBrettPhos 100mg
 15-1143 SPhos 500mg	 15-1146 RuPhos 1g	 15-1149 XPhos 500mg
 15-1152 BrettPhos 250mg	 15-1157 JackiePhos 100mg	 15-1164 t-BuBrettPhos 100mg

LIGAND KITS - Buchwald Biaryl Phosphine Ligand Mini Kit 2

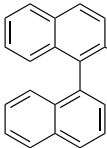
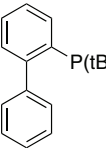
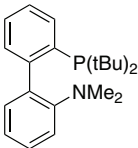
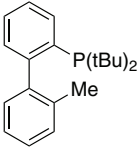
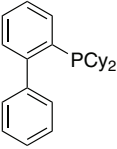
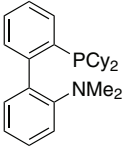
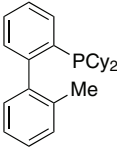
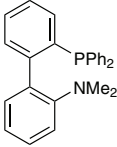
96-5490

Buchwald Biaryl Phosphine Ligand Mini Kit 2 for Aromatic Carbon-Heteroatom Bond Formation, Suzuki Coupling and Negishi Cross-coupling

For aromatic carbon-heteroatom bond formation and Suzuki Coupling.

Patents: US 6,395,916, US 6,307,087

Components also available for individual sale. Contains the following:

 15-1043 TrixiePhos 250mg	 15-1045 JohnPhos 500mg	 15-1048 tBuDavePhos 500mg
 15-1049 t-BuMePhos 500mg	 15-1140 CyJohnPhos 1g	 15-1145 DavePhos 500mg
 15-1148 MePhos 500mg	 15-1745 PhDavePhos 500mg	

LIGAND KITS - Buchwald Biaryl Phosphine Ligand Mini Kit 3

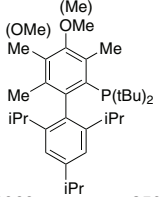
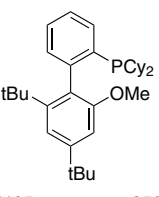
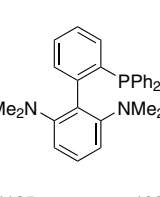
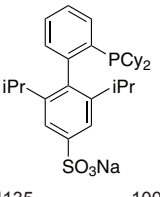
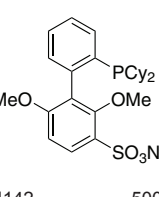
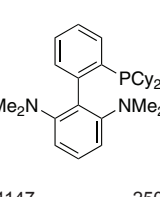
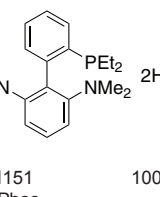
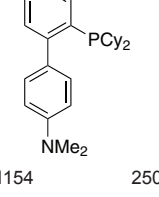
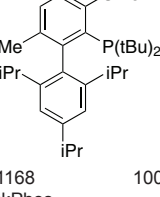
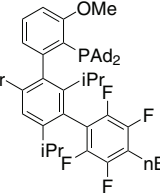
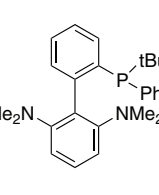
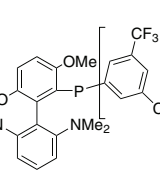
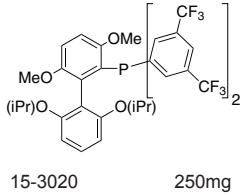
96-5495

Buchwald Biaryl Phosphine Ligand Mini Kit 3 for Aromatic Carbon-Heteroatom Bond Formation, Suzuki Coupling and Negishi Cross-coupling

For aromatic carbon-heteroatom bond formation and Suzuki Coupling.

Patents: US 6,395,916, US 6,307,087.

Components also available for individual sale. Contains the following:

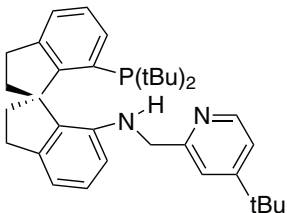
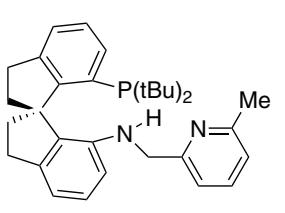
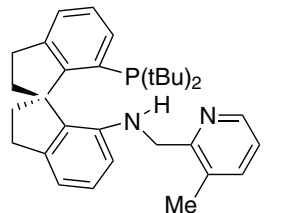
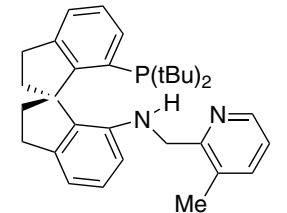
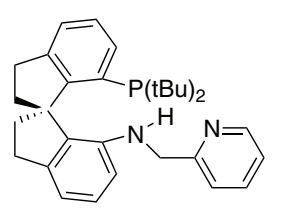
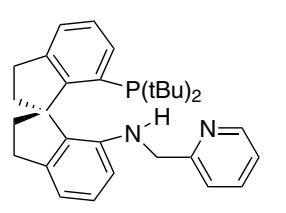
 15-1063 250mg	 15-1105 250mg VPhos	 15-1125 100mg PhCPhos
 15-1135 100mg XPhos-SO₃Na	 15-1142 500mg (water soluble SPhos)	 15-1147 250mg CPhos
 15-1151 100mg EtCPhos	 15-1154 250mg	 15-1168 100mg RockPhos
 15-2065 100mg AlPhos	 15-3010 250mg (t-Bu)PhCPhos	 15-3015 100mg
 15-3020 250mg		

LIGAND KITS - Chiral SpiroPAP Ligand Kit

96-0445

Chiral SpiroPAP Ligand Kit

Also available: 77-4035 [Ir-(R)-DTB-SpiroPAP-3-Me] and 77-4036 [Ir-(S)-DTB-SpiroPAP-3-Me] (not part of the kit)
Components also available for individual sale. Contains the following:

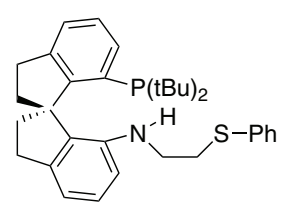
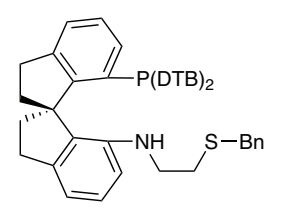
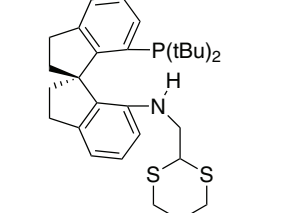
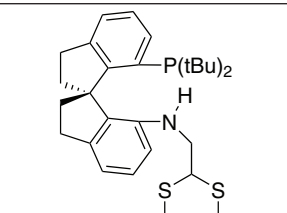
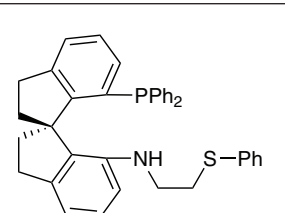
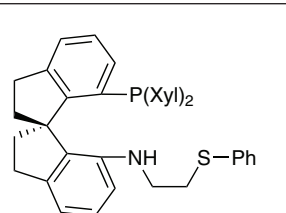
 15-5147 (R)-DTB-SpiroPAP-4-t-Bu 25mg	 15-5148 (R)-DTB-SpiroPAP-6-Me 25mg	 15-5158 (R)-DTB-SpiroPAP-3-Me 25mg
 15-5159 (S)-DTB-SpiroPAP-3-Me 25mg	 15-5166 (R)-DTB-SpiroPAP 25mg	 15-5167 (S)-DTB-SpiroPAP 25mg

LIGAND KITS - Chiral SpiroSAP Ligand Kit

96-0070

Chiral SpiroSAP Ligand Kit

Also available: 77-2510 [Ir-(R)-DTB-SpiroSAP] and 77-2511 [Ir-(S)-DTB-SpiroSAP] (not part of the kit)
Components also available for individual sale. Contains the following:

 15-1605 [(R)-DTB-SpiroSAP-Ph] 25mg	 15-1613 [(R)-DTB-SpiroSAP-Bn] 25mg	 15-1638 [(R)-DTB-SpiroSAP] 25mg
 15-1639 [(S)-DTB-SpiroSAP] 25mg	 15-1643 [(R)-Ph-SpiroSAP-Ph] 25mg	 15-1645 [(R)-Xyl-SpiroSAP-Ph] 25mg

LIGAND KITS - DSM MonoPhos™ Ligand Kit

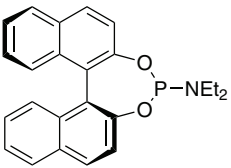
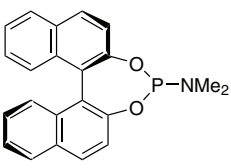
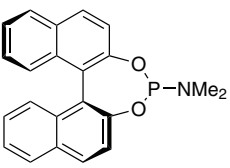
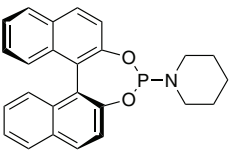
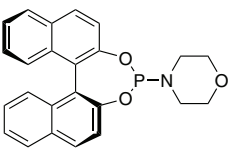
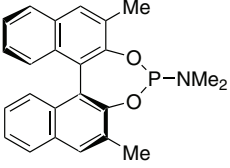
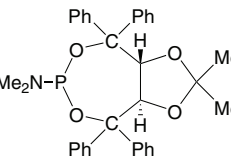
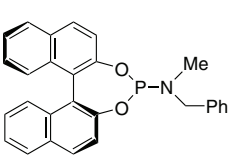
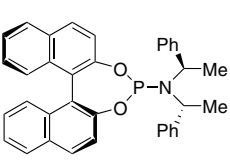
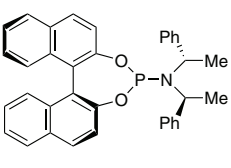
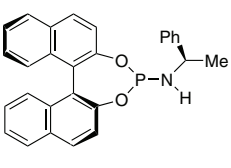
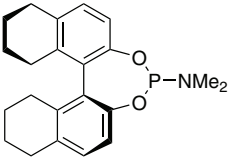
96-5650

DSM MonoPhos™ Ligand Kit

For asymmetric catalytic hydrogenations and other transformations.

Sold in collaboration with DSM for research purposes only.

Components also available for individual sale. Contains the following:

 15-1231 250mg	 15-1232 1g	 15-1233 1g
 15-1234 100mg	 15-1235 100mg	 15-1255 100mg
 15-1505 100mg	 15-1510 100mg	 15-1520 100mg
 15-1521 100mg	 15-1525 100mg	 15-3495 100mg

LIGAND KITS - Enantitech BIMA^H Ligand Kit for Asymmetric Hydrogenation

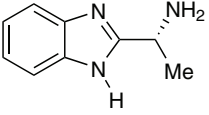
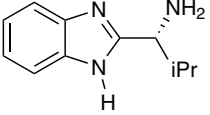
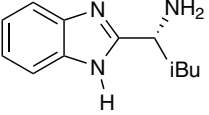
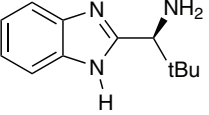
96-3700

Enantitech BIMA^H Ligand Kit for Asymmetric Hydrogenation

Sold under license from Enantitech for research purposes only.

PCT/CN2008/073648, CN 200810038929.

Components also available for individual sale. Contains the following:

 07-1234 250mg (R)-Me-BIMAH 07-1232 (S)-Me-BIMAH	 07-1238 250mg (R)-i-Pr-BIMAH 07-1236 (S)-i-Pr-BIMAH	 07-1242 100mg (R)-i-Bu-BIMAH 07-1240 (S)-i-Bu-BIMAH	 07-1245 100mg (S)-t-Bu-BIMAH
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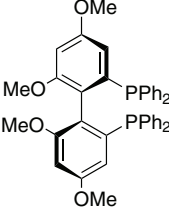
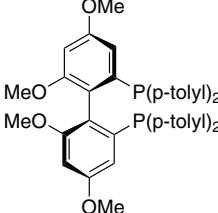
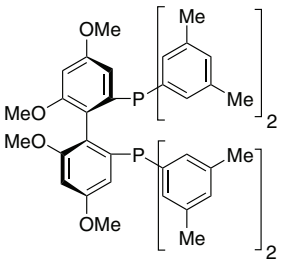
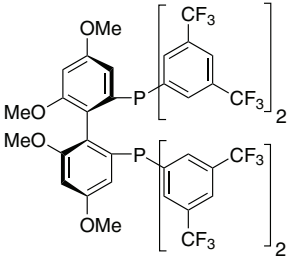
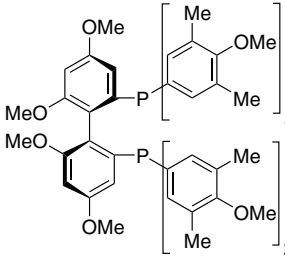
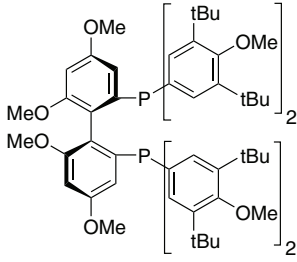
LIGAND KITS - GarphosTM Ligand Kit

96-4100

GarphosTM Ligand Kit

Sold in collaboration with KCT. Patent US App No. 61/381,493.

Components also available for individual sale. Contains the following:

 15-1653 100mg (R)-Ph-GarphosTM 15-1654 (S)-Ph-GarphosTM	 15-1657 100mg (R)-Tol-GarphosTM 15-1658 (S)-Tol-GarphosTM	 15-1661 100mg (R)-Xyl-GarphosTM 15-1662 (S)-Xyl-GarphosTM
 15-1663 100mg (R)-BTM-GarphosTM 15-1664 (S)-BTM-GarphosTM	 15-1666 100mg (R)-DMM-GarphosTM 15-1667 (S)-DMM-GarphosTM	 15-1672 100mg (R)-DTBM-GarphosTM 15-1673 (S)-DTBM-GarphosTM

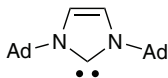
LIGAND KITS - NHC Ligand Kit 2: "Free Carbenes"

96-3765

NHC Ligand Kit 2: "Free" Carbenes

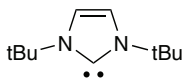
HAZ

Components also available for individual sale. Contains the following:



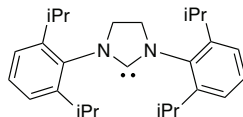
07-0324

250mg



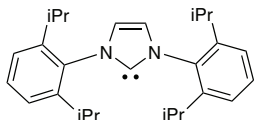
07-0333

250mg



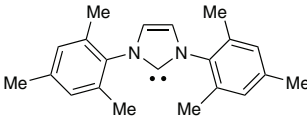
07-0593

500mg



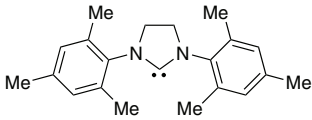
07-0595

250mg



07-0600

500mg



07-0605

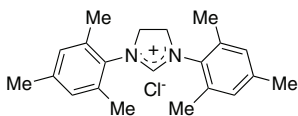
500mg

LIGAND KITS - NHC Ligand Kit 3: Variety of N-Heterocyclic Carbenes

96-3770

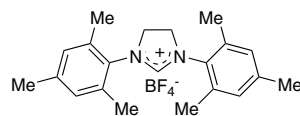
NHC Ligand Kit 3: Variety of N-Heterocyclic Carbenes

Components also available for individual sale. Contains the following:



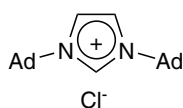
07-0299

1g



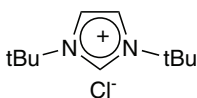
07-0302

1g



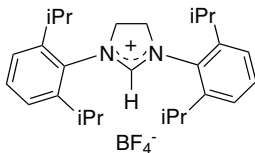
07-0322

250mg



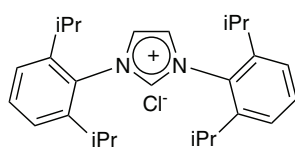
07-0368

250mg



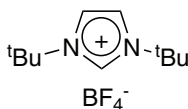
07-0587

1g



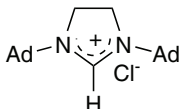
07-0590

500mg



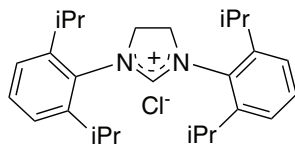
07-0598

500mg



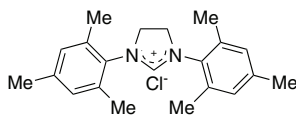
07-4007

500mg



07-4009

500mg



07-4011

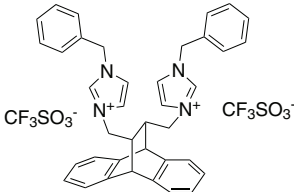
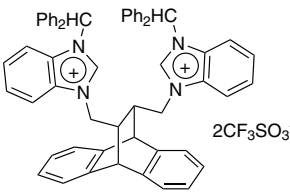
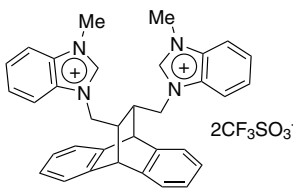
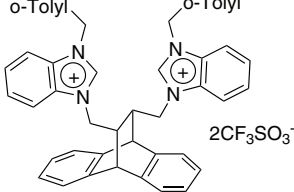
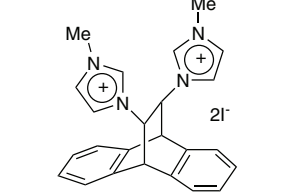
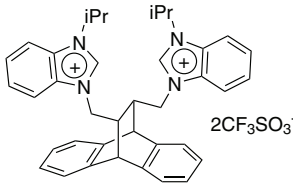
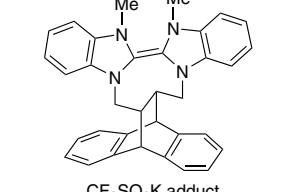
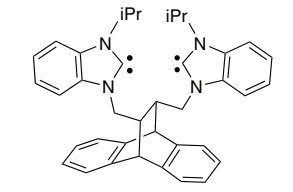
500mg

LIGAND KITS - NHC Ligand Kit 4: Bis Carbenes

96-3775

NHC Ligand Kit 4: Bis Carbenes

Components also available for individual sale. Contains the following:

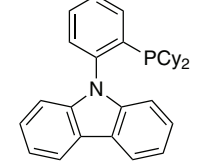
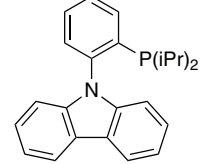
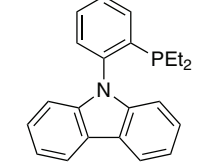
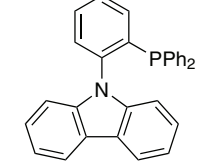
 07-0076 100mg	 07-0078 100mg	 07-0080 100mg
 07-0082 100mg	 07-0083 100mg	 07-0084 100mg
 07-0086 100mg	 07-0088 100mg	

LIGAND KITS - PhenCar-Phos Ligand Kit

96-3780

PhenCar-Phos Ligand Kit

Components also available for individual sale. Contains the following:

 15-0445 250mg PhenCar-Phos	 15-0493 250mg i-Pr PhenCar-Phos	 15-0496 100mg Et PhenCar-Phos	 15-0498 250mg Ph PhenCar-Phos
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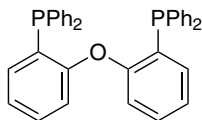
LIGAND KITS - Phosphine Ligand Kit

96-1650

Phosphine Ligand Kit for Palladium-Catalyzed Carbon-Carbon and Carbon-Heteroatom Bond Formation

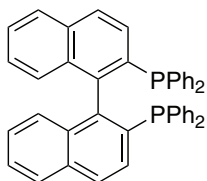
For Palladium-catalyzed carbon-carbon and carbon-heteroatom bond formation.

Components also available for individual sale. Contains the following:



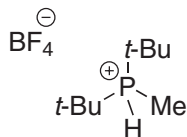
15-0380
DPEphos

5g



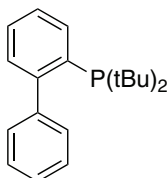
15-0433
rac-BINAP

1g



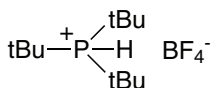
15-1023

1g



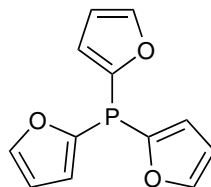
15-1045
JohnPhos

500mg



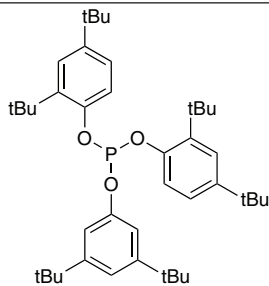
15-6000

1g



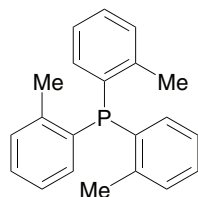
15-6372

500mg



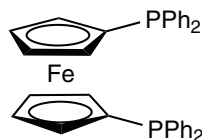
15-7720

10g



15-8050

5g



26-0270
DPPF

1g

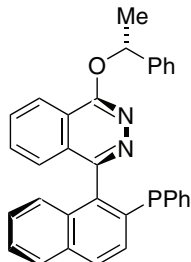
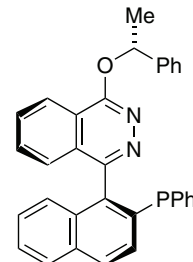
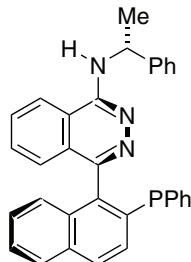
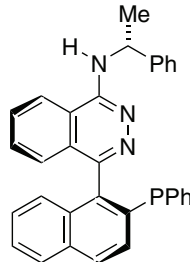
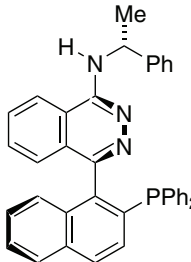
LIGAND KITS - PINAP Ligand Kit

96-7050

PINAP Ligand Kit

For a variety of asymmetric C-C bond formations.

Components also available for individual sale. Contains the following:

 15-1782 (R,R)-O-PINAP 250mg	 15-1783 (R,S)-O-PINAP 250mg	 15-1784 (R,R)-N-PINAP 100mg
 15-1786 (R,S)-N-PINAP 250mg	 15-1787 (S,R)-N-PINAP 250mg	

LIGAND KITS - SKP Ligand Kit

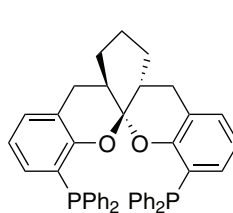
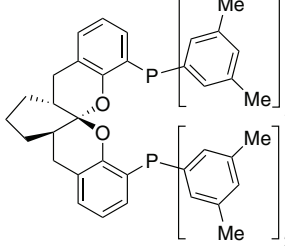
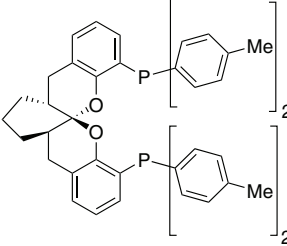
96-2310

SKP Ligand Kit for asymmetric-allylic amination and cyclopropanation

Sold in collaboration with SIOC for research purposes only.

Patents PCT/CN2013/071091, CN202110253896.5

Components also available for individual sale. Contains the following:

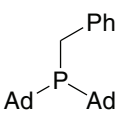
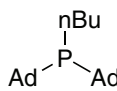
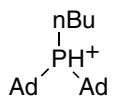
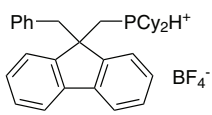
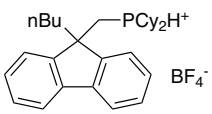
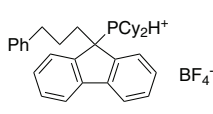
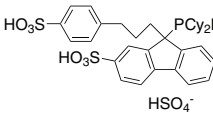
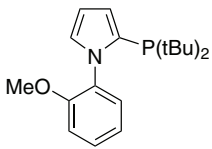
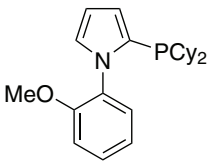
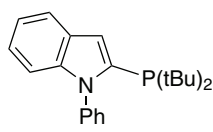
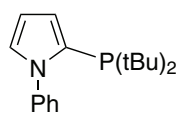
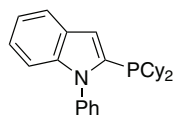
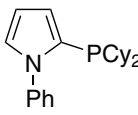
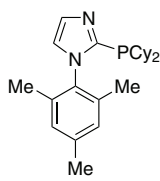
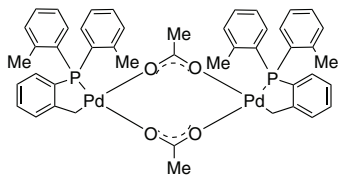
 15-4310 (R,R,R)-(+)-Ph-SKP 25mg	 15-4320 (R,R,R)-(+)-Xyl-SKP 25mg	 15-4330 (R,R,R)-(+)-Tol-SKP 25mg
15-4311 (S,S,S)-(-)-Ph-SKP	15-4321 (S,S,S)-(-)-Xyl-SKP	15-4331 (S,S,S)-(-)-Tol-SKP

LIGAND KITS - Solvias cataCXium® Ligand Kit

96-6651

Solvias cataCXium® Ligand Kit for C-X coupling reactions

For C-X coupling reactions. Sold in collaboration with Solvias for research purposes only.
Components also available for individual sale. Contains the following:

 15-0038 500mg [cataCXium® ABn]	 15-0483 1g [cataCXium® A]	 15-0495 250mg [cataCXium® AHI]	 15-1072 500mg [cataCXium® FBn]
 15-1074 500mg [cataCXium® FBu]	 15-1076 500mg [cataCXium® FPrPh]	 15-1078 500mg [cataCXium® FSulf]	 15-2975 500mg [cataCXium® POMetB]
 15-2980 500mg [cataCXium® POMeCy]	 15-3550 500mg [cataCXium® PlntB]	 15-3600 500mg [cataCXium® PtB]	 15-3605 500mg [cataCXium® Plncy]
 15-3610 500mg [cataCXium® PCy]	 15-6362 500mg [cataCXium® PICy]	 46-0290 250mg [cataCXium® C]	

LIGAND KITS - Solvias Josiphos Ligand Kit

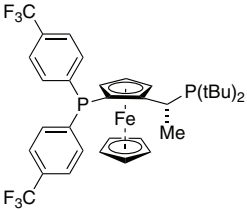
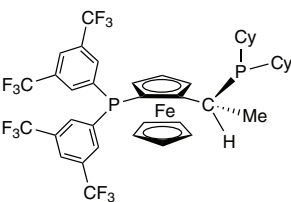
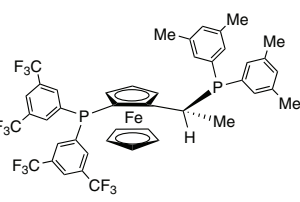
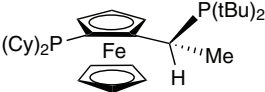
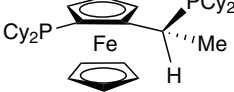
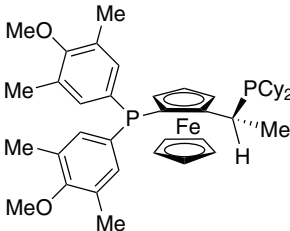
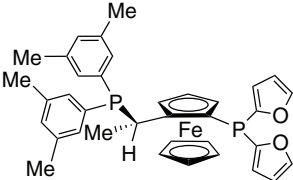
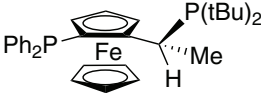
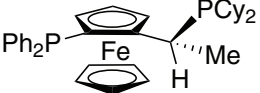
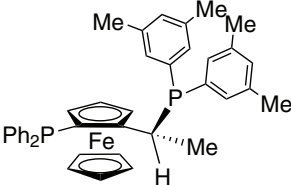
96-3650

Solvias Josiphos Ligand Kit

For asymmetric catalytic hydrogenations and other transformations.

Sold in collaboration with Solvias for research purposes only.

Components also available for individual sale. Contains the following:

 26-0650 100mg	 26-0960 100mg	 26-0965 100mg
 26-0975 100mg	 26-1000 100mg	 26-1150 100mg
 26-1170 100mg	 26-1200 100mg	 26-1210 100mg
 26-1255 100mg		

LIGAND KITS - Solvias MandyPhos™ Ligand Kit

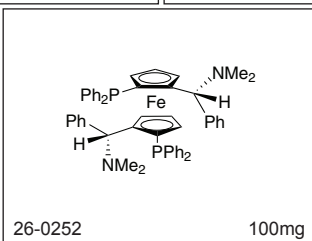
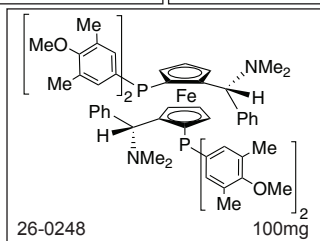
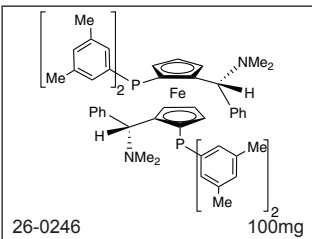
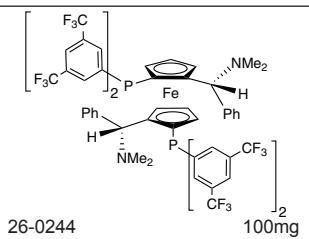
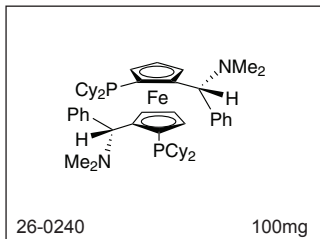
96-3652

Solvias MandyPhos™ Ligand Kit

For asymmetric catalytic hydrogenations and other transformations.

Sold in collaboration with Solvias for research purposes only.

Components also available for individual sale. Contains the following:



LIGAND KITS - Solvias Walphos Ligand Kit

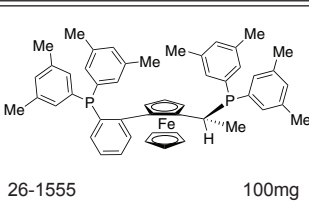
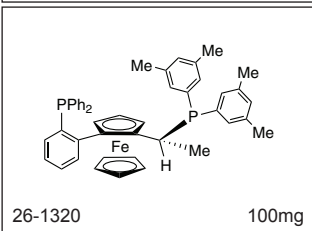
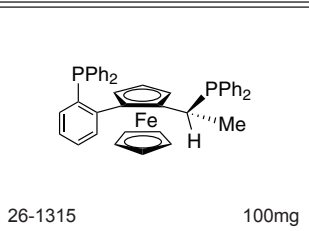
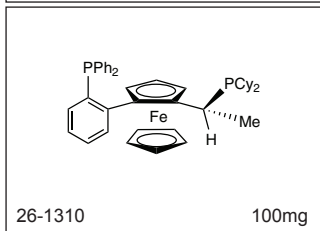
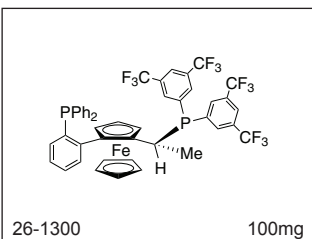
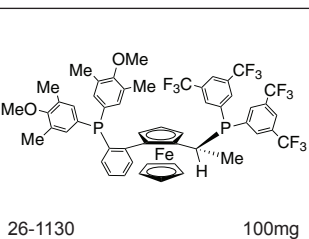
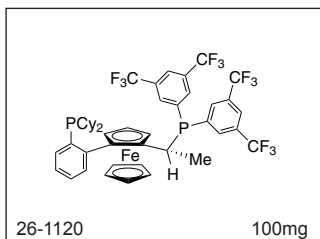
96-3651

Solvias Walphos Ligand Kit

For asymmetric catalytic hydrogenations and other transformations.

Sold in collaboration with Solvias for research purposes only.

Components also available for individual sale. Contains the following:



LIGAND KITS - Solvias (R)-MeO-BIPHEP Ligand Kit

96-3655

Solvias (R)-MeO-BIPHEP Ligand Kit

Sold in collaboration with Solvias for research purposes only.
Components also available for individual sale. Contains the following:

	15-0042	100mg
	15-0044	100mg
	15-0112	100mg
	15-0156	100mg
	15-0158	100mg
	15-0178	100mg
	15-0488	100mg
	15-0652	100mg
	15-0654	100mg

LIGAND KITS - Solvias (S)-MeO-BIPHEP Ligand Kit

96-3656

Solvias (S)-MeO-BIPHEP Ligand Kit

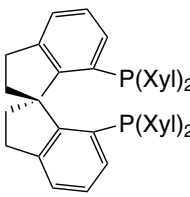
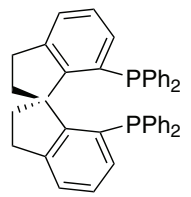
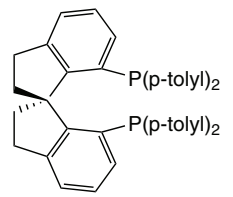
Sold in collaboration with Solvias for research purposes only.
Components also available for individual sale. Contains the following:

15-0043	(S)-(+)-2,2'-Bis[di(3,5-di- <i>t</i> -butyl-4-methoxyphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (910134-30-4)	100mg
15-0045	(S)-(-)-2,2'-Bis[di(3,5-di- <i>t</i> -butylphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (167709-31-1)	100mg
15-0113	(S)-(-)-2,2'-Bis(di-2-furanylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (145214-59-1)	100mg
15-0157	(S)-(-)-2,2'-Bis(di- <i>p</i> -tolylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (133545-25-2)	100mg
15-0159	(S)-(-)-2,2'-Bis[di(3,4,5-trimethoxyphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (256235-61-7)	100mg
15-0179	(S)-(-)-2,2'-Bis(diphenylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (S)-MeO-BIPHEP (133545-17-2)	100mg
15-0489	(S)-(-)-2,2'-Bis[di(3,5-xylyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (362634-22-8)	100mg
15-0653	(S)-(+)-2,2'-Bis[di(3,5-di- <i>i</i> -propyl-4-dimethylaminophenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (919338-66-2)	100mg
15-0655	(S)-(-)-2,2'-Bis(di- <i>i</i> -propylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (150971-43-0)	100mg

LIGAND KITS - Spiro Biphosphine Ligand Kit

96-0060 Spiro Bisphosphine Ligand Kit

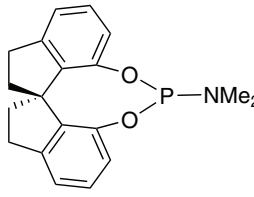
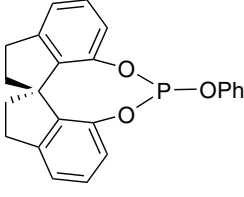
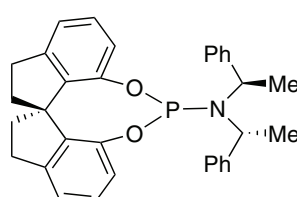
Components also available for individual sale. Contains the following:

 25mg 15-5168 (R)-Xyl-SDP 15-5169 (S)-Xyl-SDP	 25mg 15-5174 (R)-SDP 15-5175 (S)-SDP	 25mg 15-5180 (R)-Tol-SDP 15-5181 (S)-Tol-SDP
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LIGAND KITS - Spiro Monophosphine & Monophosphoramidite Ligand Kit

96-0065 Spiro Monophosphite and Monophosphoramidite Ligand Kit

Components also available for individual sale. Contains the following:

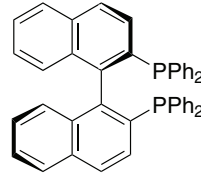
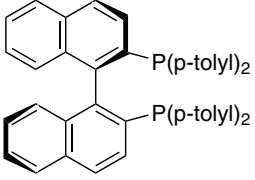
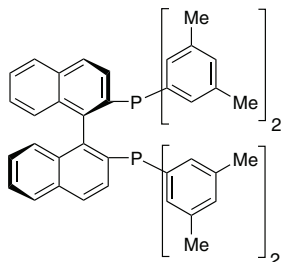
 100mg 15-5150 (R)-SIPHOS 15-5151 (S)-SIPHOS	 100mg 15-5156 (R)-ShiP 15-5157 (S)-ShiP	 100mg 15-5162 (R)-SIPHOS-PE 15-5163 (S)-SIPHOS-PE
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LIGAND KITS - Takasago BINAP Ligand Kit

96-6950 Takasago BINAP Ligand Kit

Sold in collaboration with Takasago.

Components also available for individual sale. Contains the following:

 250mg 15-0150 (R)-(+)-BINAP 15-0151 (S)-(-)-BINAP	 250mg 15-0152 (R)-(+)-TolBINAP 15-0153 (S)-(-)-TolBINAP	 250mg 15-0476 (R)-(+)-XylBINAP 15-0477 (S)-(-)-XylBINAP
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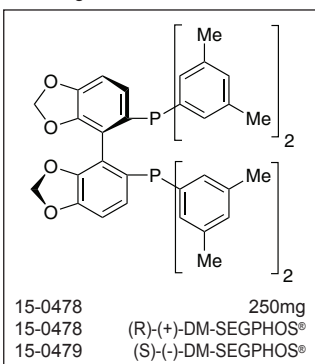
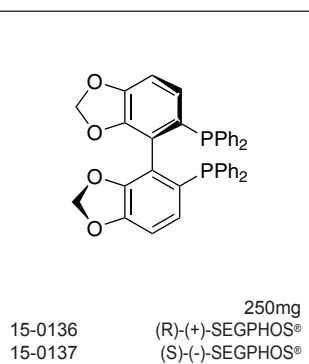
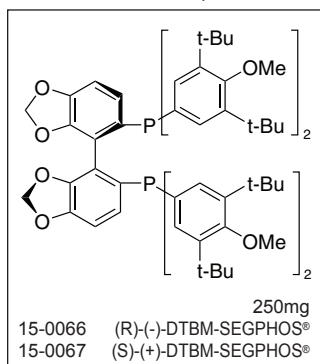
LIGAND KITS - Takasago SEGPHOS® Ligand Kit

96-6900

Takasago SEGPHOS® Ligand Kit

Sold in collaboration with Takasago.

Components also available for individual sale. Contains the following:



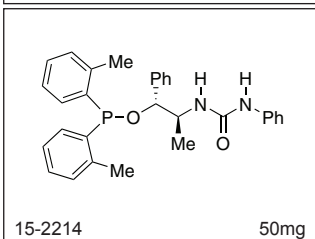
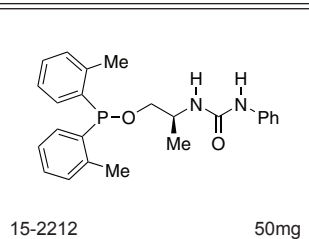
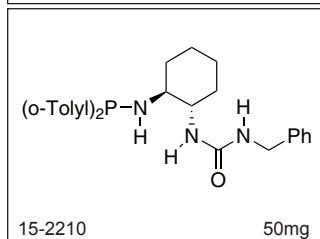
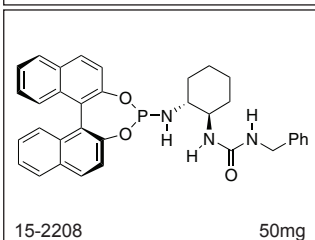
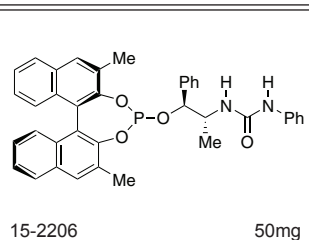
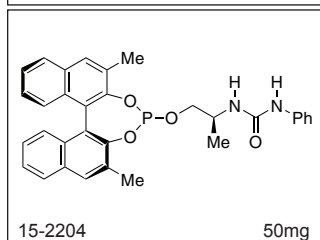
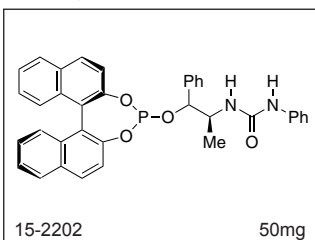
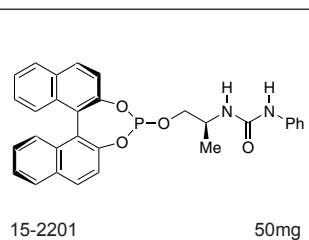
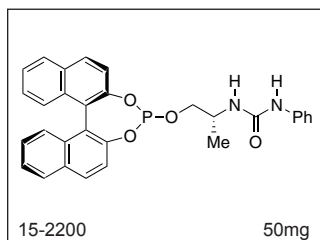
LIGAND KITS - UREAphos & METAMORPhos Ligand Kit

96-3740

UREAphos and METAMORPhos Ligand Kit for Asymmetric Hydrogenation

Sold under license from InCatT for research purposes only. WO2004/103559, WO2009/065853

Components also available for individual sale. Contains the following:

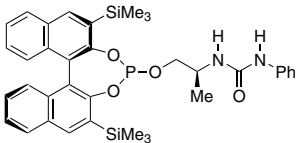
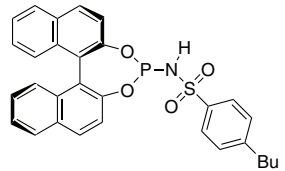
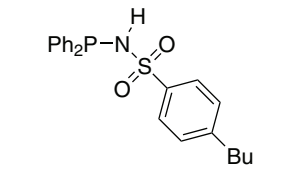
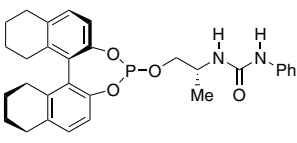
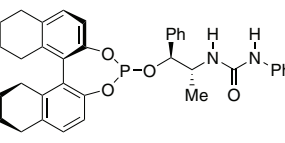
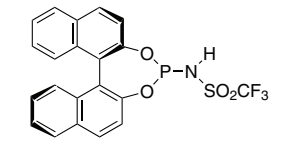


LIGAND KITS - UREAphos & METAMORPhos Ligand Kit

96-3740

UREAphos and METAMORPhos Ligand Kit for Asymmetric Hydrogenation

(continued)

 15-2216 50mg	 15-2218 50mg	 15-2220 50mg
 15-2222 50mg	 15-2224 50mg	 15-2228 50mg

METAL SCAVENGING KITS - BASF Metals Scavenging Agent Kit (MSA Kit)

96-6700

BASF Metals Scavenging Agent Kit (MSA Kit)

Sold in collaboration with BASF for research purposes only.

Components also available for individual sale. Contains the following:

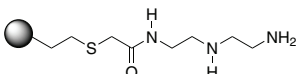
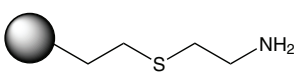
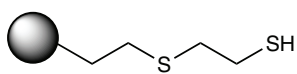
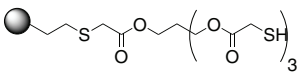
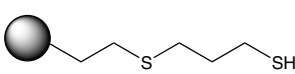
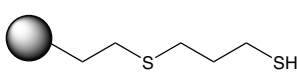
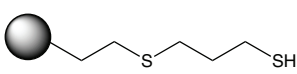
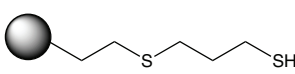
06-0805	Metals scavenging agent, Phosphotungstic acid modified activated carbon (BASF MSA-FC C-1) (7440-44-0)	10g
13-6300	Metals scavenging agent, Phosphotungstic acid modified alumina (BASF MSA-FC Al-1) (1344-28-1)	10g
14-4353	Metals scavenging agent, Mercaptopropyl modified silica (BASF MSA-FC Si-3) (112926-00-8)	10g

METAL SCAVENGING KITS - PhosphonicS Metals Scavenging Kit

96-6750

PhosphonicS Metals Scavenging Kit

Sold in collaboration with PhosphonicS Ltd. for research purposes only.
Components also available for individual sale. Contains the following:

 16-0210 (PhosphonicS STA3) 10g	 16-0215 (PhosphonicS SEA) 10g	 16-0650 (PhosphonicS SEM26) 10g
 16-1540 (PhosphonicS SET) 10g	 16-1700 (PhosphonicS SPM36) 10g	 16-1702 (PhosphonicS SPM36f) 10g
 16-1704 (PhosphonicS SPM32f) 10g	 16-1706 (PhosphonicS SPM32) 10g	

Metal scavengers are increasingly used as an effective way to solve metal removal problems associated with Active Pharmaceutical Ingredients (API's) and synthetic intermediates. This is an often complex technical challenge, influenced by a number of factors including the significant structural variations with API's, the polar functional groups which APIs tend to contain, the environment (solvent and pH) and potential incompatibilities within the API. PhosphincS has designed a portfolio of silica-based materials containing a diverse range of functional groups to address effective metal scavenging.

Properties of PhosphonicS' Broad Portfolio of Metal Scavengers

- High affinity for a wide range of metals, in different oxidation states
- Fast kinetics - highly active at ambient temperatures
- High selectivity for the metal, meaning minimal loss of the API/compound
- Broad solvent and pH compatibility with both organic and aqueous formulations, reducing the requirements of time-consuming and costly solvent switches
- No swelling of the materials are required
- Excellent stability - thermal, physical, chemical and mechanical
- Very high purity - eliminating issues of extractable impurities
- Enhanced performance, due to multiple functional groups and higher effective loadings
- Metal recycling options
- Availability on process scale

Performance Benefits from using PhosphonicS' Metal Scavengers

- **Faster:** purification, batch processing, problem-solving, market introduction
- **Reduced:** development time, valuable API losses, total manufacturing costs, environmental burden
- **Enhanced:** process, productivity, compliance

NANOMATERIAL KITS - Cadmium selenide StremDots™ Quantum Dot (CdSe core) Kit

96-0800 **Cadmium selenide StremDots™ quantum dot (CdSe core) kit, 50umol/L in hexanes, 525-625nm peak emissions**
HAZ
 Components also available for individual sale. Contains the following:

48-1011	Cadmium selenide StremDots™ quantum dot (CdSe core), 50umol/L in hexanes, 525nm peak emission (1306-24-7)	5ml
48-1017	Cadmium selenide StremDots™ quantum dot (CdSe core), 50umol/L in hexanes, 550nm peak emission (1306-24-7)	5ml
48-1023	Cadmium selenide StremDots™ quantum dot (CdSe core), 50umol/L in hexanes, 575nm peak emission (1306-24-7)	5ml
48-1030	Cadmium selenide StremDots™ quantum dot (CdSe core), 50umol/L in hexanes, 600nm peak emission (1306-24-7)	5ml
48-1035	Cadmium selenide StremDots™ quantum dot (CdSe core), 50umol/L in hexanes, 625nm peak emission (1306-24-7)	5ml

Item #	Peak Emission	Particle size (diameter)	Quantum Yield
48-1011	525nm	2.8nm	>20%
48-1017	550nm	3.5nm	>10%
48-1023	575nm	3.9nm	>10%
48-1030	600nm	4.7nm	>20%
48-1035	625nm	5.3nm	>20%

Kit contains 5ml of each of the above 5 products. Ligand capping agent oleylamine. Stable in dispersions > 6 months.

*Particle size reported excludes ligand capping agent. All sizes determined by TEM.

† Available at nanoparticle concentration of 50µmol per liter.

NANOMATERIAL KITS - Cadmium selenide/Cadmium sulfide StremDots™ Quantum Rod Kit

96-0813 **Cadmium selenide/cadmium sulfide StremDots™ quantum rod kit (CdSe/CdS elongated core/shell), 5 mg/ml in hexanes, 560nm, 590nm, 620nm peak emissions**
HAZ
 Components also available for individual sale. Contains the following:

48-1053	Cadmium selenide/cadmium sulfide StremDots™ quantum rod (CdSe/CdS elongated core/shell), 5 mg/ml in hexanes, 560nm peak emission (1306-24-7)	0.5ml
48-1056	Cadmium selenide/cadmium sulfide StremDots™ quantum rod (CdSe/CdS elongated core/shell), 5 mg/ml in hexanes, 590nm peak emission (1306-24-7)	0.5ml
48-1059	Cadmium selenide/cadmium sulfide StremDots™ quantum rod (CdSe/CdS elongated core/shell), 5 mg/ml in hexanes, 620nm peak emission (1306-24-7)	0.5ml

NANOMATERIAL KITS - Gold Gemini Nanorods Kit, CTAB Free

96-1549

Gold Gemini Nanorods Kit, CTAB Free (Wavelength 650-850 nm)

Rods are synthesized without CTAB. Store at 4°C - 8°C. Do not freeze. At storage temperature the product may appear opaque. Follow the procedure for re-dispersing surfactants as described in the technical note. Complete this process before use to dissolve precipitated stabilizer. Sold in collaboration with SONA Nanotech for research purposes only.

Components also available for individual sale. Contains the following:

79-7010	Gold Gemini Nanorods, CTAB Free (Wavelength 650 nm) (7440-57-5)	5ml
79-7015	Gold Gemini Nanorods, CTAB Free (Wavelength 700 nm) (7440-57-5)	5ml
79-7020	Gold Gemini Nanorods, CTAB Free (Wavelength 750 nm) (7440-57-5)	5ml
79-7025	Gold Gemini Nanorods, CTAB Free (Wavelength 800 nm) (7440-57-5)	5ml
79-7030	Gold Gemini Nanorods, CTAB Free (Wavelength 850 nm) (7440-57-5)	5ml

Item #	LPSR Maximum (nm)	Length (nm)	Width (nm)	Aspect Ratio	Color & Form
79-7010	640 - 670	25 - 31	13 - 18	1.7 - 1.9	violet liq.
79-7015	685 - 715	37 - 43	13 - 18	2.4 - 2.8	blue liq.
79-7020	735 - 765	37 - 44	10 - 13	3.4 - 3.7	red-purple liq.
79-7025	785 - 815	40 - 50	10 - 13	3.8 - 4.1	red-orange liq.
79-7030	835 - 865	48 - 55	9 - 12	4.6 - 5.3	maroon-purple liq.

Concentration: >30 µg/ml

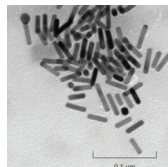
pH: 5.5 - 7.5

Stabilizer: Amphiphilic Agents

Solvent: Stabilized with amphiphilic agents in conductivity grade water (18.0 MΩ cm⁻¹)

Optical Density: 1.0 - 1.2

Shelf Life: 12 months



NANOMATERIAL KITS - Gold Nanoparticles Kit

96-1547

Gold Nanoparticles Kit (5nm-40nm diameter, OD 1, stabilized suspension citrate buffer)

Components also available for individual sale. Contains the following:

79-0182	Gold Nanoparticles (5nm, 1 OD, supplied in 0.1mM stabilizing surfactant, 515-520nm abs. max.) (7440-57-5)	25ml
79-0210	Gold Nanoparticles (10nm, 1 OD, supplied in 0.1mM stabilizing surfactant, 515-520nm abs. max.) (7440-57-5)	25ml
79-0212	Gold Nanoparticles (15nm, 1 OD, supplied in 0.1mM stabilizing surfactant, 520nm abs. max.) (7440-57-5)	25ml
79-0214	Gold Nanoparticles (20nm, 1 OD, supplied in 0.1mM stabilizing surfactant, 524nm abs. max.) (7440-57-5)	25ml
79-0216	Gold Nanoparticles (30nm, 1 OD, supplied in 0.1mM stabilizing surfactant, 526nm abs. max.) (7440-57-5)	25ml
79-0218	Gold Nanoparticles (40nm, 1 OD, supplied in 0.1mM stabilizing surfactant, 530nm abs. max.) (7440-57-5)	25ml

NANOMATERIAL KITS - Gold Nanoparticles Kit, Reactant-Free

96-1545 Gold Nanoparticles Kit, Reactant-Free
(5nm-40nm diameter, OD 1, suspension in phosphate-buffered saline, 515-530nm abs. max.)
 Components also available for individual sale. Contains the following:

79-0180	Gold Nanoparticles (5 nm diameter, 1 OD, stabilized suspension in phosphate-buffered saline, 515-520 nm abs. max.) reactant free (7440-57-5)	25ml
79-0184	Gold Nanoparticles (10nm diameter, 1 OD, stabilized suspension in phosphate-buffered saline, 520nm abs. max.) reactant free (7440-57-5)	25ml
79-0186	Gold Nanoparticles (15nm diameter, 1 OD, stabilized suspension in phosphate-buffered saline, 520nm abs. max.) reactant free (7440-57-5)	25ml
79-0188	Gold Nanoparticles (20nm diameter, 1 OD, stabilized suspension in phosphate-buffered saline, 524nm abs. max.) reactant free (7440-57-5)	25ml
79-0190	Gold Nanoparticles (30nm diameter, 1 OD, stabilized suspension in phosphate-buffered saline, 526nm abs. max.) reactant free (7440-57-5)	25ml
79-0192	Gold Nanoparticles (40nm diameter, 1 OD, stabilized suspension in phosphate-buffered saline, 530nm abs. max.) reactant free (7440-57-5)	25ml

NANOMATERIAL KITS - Gold Nanorods Kit (Axial Diameter - 25nm)

96-1530 Gold Nanorods Kit (Axial Diameter - 25 nm, wavelength 550-700 nm)
 Components also available for individual sale. Contains the following:

79-6000	Gold Nanorods (Axial Diameter - 25 nm) (Wavelength 550 nm) (7440-57-5)	25ml
79-6005	Gold Nanorods (Axial Diameter - 25 nm) (Wavelength 600 nm) (7440-57-5)	25ml
79-6010	Gold Nanorods (Axial Diameter - 25 nm) (Wavelength 650 nm) (7440-57-5)	25ml
79-6015	Gold Nanorods (Axial Diameter - 25 nm) (Wavelength 700 nm) (7440-57-5)	25ml

NANOMATERIAL KITS - Gold Nanorods Kit (Axial Diameter - 10nm)

96-1535 Gold Nanorods Kit (Axial Diameter - 10 nm, wavelength 700-808 nm)
 Components also available for individual sale. Contains the following:

79-6020	Gold Nanorods (Axial Diameter - 10 nm) (Wavelength 700 nm) (7440-57-5)	25ml
79-6025	Gold Nanorods (Axial Diameter - 10 nm) (Wavelength 750 nm) (7440-57-5)	25ml
79-6030	Gold Nanorods (Axial Diameter - 10 nm) (Wavelength 780 nm) (7440-57-5)	25ml
79-6035	Gold Nanorods (Axial Diameter - 10 nm) (Wavelength 808 nm) (7440-57-5)	25ml

NANOMATERIAL KITS - Gold Nanospheres Kit

96-1540 Gold Nanospheres Kit (30-90 nm)
 Components also available for individual sale. Contains the following:

79-6040	Spherical Gold Nanoparticles (30 nm) (7440-57-5)	25ml
79-6045	Spherical Gold Nanoparticles (50 nm) (7440-57-5)	25ml
79-6050	Spherical Gold Nanoparticles (70 nm) (7440-57-5)	25ml
79-6055	Spherical Gold Nanoparticles (90 nm) (7440-57-5)	25ml

NANOMATERIAL KITS - Graphene Quantum Dots (GQDs) Master Kit

96-7410

Graphene Quantum Dots (GQDs) Master Kit

Sold in collaboration with Dotz Nano Ltd. for research purposes only.
Suggested use within 6 months of purchase. Do not freeze. Store in DARK.
Components also available for individual sale. Contains the following:

06-0330	Graphene Quantum Dots (GQDs), Aqua-Green Luminescent (1034343-98-0)	100mg
06-0332	Graphene Quantum Dots (GQDs) in water, Aqua-Green Luminescent (1034343-98-0)	100ml
06-0334	Graphene Quantum Dots (GQDs), Blue Luminescent (1034343-98-0)	100mg
06-0336	Graphene Quantum Dots (GQDs) in water, Blue Luminescent (1034343-98-0)	100ml
06-0340	Graphene Quantum Dots (GQDs) in water, Cyan Luminescent (1034343-98-0)	100ml

Item #	Photoluminescence			
	QY* *	λ max *	Max emission	FWHM *
06-0330 / 06-0332	>17%	485 nm	525 nm	70 nm
06-0334 / 06-0336	>65%	350 nm	445 nm	65 nm
06-0340	>25%	420 nm	490 nm	80 nm
Particle diameter: <5 nm Topographic height: 1.0 - 2.0 nm Concentration: 1mg/ml (for liquid items)				
Abbreviations: QY* = Quantum Yield; λ max = Maximum excitation wavelength; FWHM = Full width at half maximum				

NANOMATERIAL KITS - Graphene Quantum Dots (GQDs) Mini Kit (Powders)

96-7425

Graphene Quantum Dots (GQDs) Mini Kit (Powders)

Sold in collaboration with Dotz Nano Ltd. for research purposes only.
Suggested use within 6 months of purchase. Do not freeze. Store in DARK.
Components also available for individual sale. Contains the following:

06-0330	Graphene Quantum Dots (GQDs), Aqua-Green Luminescent (1034343-98-0)	100mg
06-0334	Graphene Quantum Dots (GQDs), Blue Luminescent (1034343-98-0)	100mg

Item #	Color & Form	Photoluminescence			
		QY* *	λ max *	Max emission	FWHM *
06-0330	dark red-brown powdr.	>17%	485 nm	525 nm	70 nm
06-0334	dark brown powdr.	>65%	350 nm	445 nm	65 nm
Particle diameter: <5 nm Topographic height: 1.0 - 2.0 nm					
Abbreviations: QY* = Quantum Yield; λ max = Maximum excitation wavelength; FWHM = Full width at half maximum					

NANOMATERIAL KITS - Graphene Quantum Dots (GQDs) Mini Kit (Liquids)

96-7420

Graphene Quantum Dots in water (GQDs) Mini Kit (Liquids)

Sold in collaboration with Dotz Nano Ltd. for research purposes only.
Suggested use within 6 months of purchase. Do not freeze. Store in DARK.
Components also available for individual sale. Contains the following:

06-0332	Graphene Quantum Dots (GQDs) in water, Aqua-Green Luminescent (1034343-98-0)	100ml
06-0336	Graphene Quantum Dots (GQDs) in water, Blue Luminescent (1034343-98-0)	100ml
06-0340	Graphene Quantum Dots (GQDs) in water, Cyan Luminescent (1034343-98-0)	100ml

Item #	Color & Form	Photoluminescence			
		QY* *	λ max *	Max emission	FWHM *
06-0332	cloudy orange liq.	>17%	485 nm	525 nm	70 nm
06-0336	cloudy colorless liq.	>65%	350 nm	445 nm	65 nm
06-0340	cloudy brown liq.	>25%	420 nm	490 nm	80 nm
Particle diameter: <5 nm Topographic height: 1.0 - 2.0 nm Concentration: 1mg/ml					
Abbreviations: QY* = Quantum Yield; λ max = Maximum excitation wavelength; FWHM = Full width at half maximum					

NANOMATERIAL KITS - High Surface Area Silica Nanoparticles Kit

96-5050

NEW

High Surface Area Silica Nanoparticles Kit

These products are under license of patented Technology from King Abdullah University of Science and Technology – KAUST. Patent PCT/IB2010/002421.

Components also available for individual sale. Contains the following:

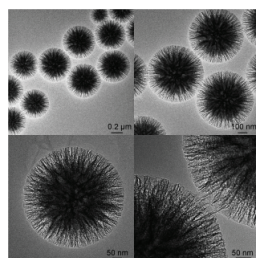
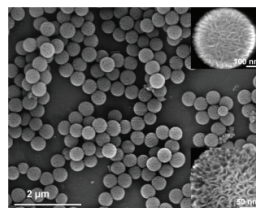
14-6100	High Surface area Silica nanoparticles, large, particle size ~900-1000 nm, surface area ~700 m ² /g, (KCC-1 L1) (112945-52-5)	1g
14-6110	High Surface area Silica nanoparticles, large, particle size ~900-1000 nm, surface area ~600 m ² /g, (KCC-1 L2) (112945-52-5)	1g
14-6120	High Surface area Silica nanoparticles, large, particle size ~900-1000 nm, surface area ~550 m ² /g (KCC-1 L3) (112945-52-5)	1g
14-6200	High Surface area Silica nanoparticles, medium, particle size ~400-450 nm, surface area ~400 m ² /g, (KCC-1 M1) (112945-52-5)	1g
14-6210	High Surface area Silica nanoparticles, medium, particle size ~300-350 nm, surface area ~600 m ² /g, (KCC-1 M2) (112945-52-5)	1g
14-6300	High Surface area Silica nanoparticles, small, particle size ~130-190 nm, surface area ~380 m ² /g, (KCC-1 S1) (112945-52-5)	1g
14-6310	High Surface area Silica nanoparticles, small, particle size ~40-50 nm, surface area ~520 m ² /g, (KCC-1 S2) (112945-52-5)	250mg

Technical Note:

- Novel fibrous shaped silica nanospheres, denoted as KCC-1 (KAUST Catalysis Center)[1], have unique physical properties which have never before been reported in silica materials. These nanomaterials have been developed by Prof. J. M. Basset of King Abdullah University of Science and Technology (KAUST). A fibrous surface morphology arranged in three-dimensional structure forms the spheres (Fig. 1). Unlike traditional pore-based silica, these nanospheres possess a fibrous structure that increases accessibility to the available surface area; this in turn, significantly increases the catalytic activity.

These materials exhibit excellent physical properties, including a high surface area, a fibrous surface morphology, good thermal and hydrothermal stabilities and high mechanical stability (Table 1). The fibrous morphology of KCC-1 remains unaffected even after mechanical compression up to 216 MPa pressure. This is superior to the conventional MCM-41 type of silica, which is affected at pressure 86 MPa.^[1]

A range of heterogeneous catalysts, prepared using KCC-1 as a supporting material, have been showing excellent catalytic activity for various transformations of research and industrial importance. As a catalyst support, sorbent or carrier, KCC-1 is able to demonstrate superior activity as compared to regular mesoporous silica materials in energy related processes^[2-3], a variety of organic reactions^[4-7], biomedical applications and drug delivery systems^[8], optoelectronic devices^[9] and many others.



Product #	Category	Grade	Particle Size (nm)	Surface Area (m ² /g)	Pore Volume (cm ³ /g)
14-6100	Large	(KCC-1 L1)	~900-1000	~700	~1.4
14-6110	Large	(KCC-1 L2)	~900-1000	~600	~1.2
14-6120	Large	(KCC-1 L3)	~900-1000	~550	~0.9
14-6200	Medium	(KCC-1 M1)	~400-450	~400	~0.7
14-6210	Medium	(KCC-1 M2)	~300-350	~600	~0.6
14-6300	Small	(KCC-1 S1)	~130-190	~380	~0.8
14-6310	Small	(KCC-1 S2)	~40-50	~520	~1.3

References:

- Angew. Chem. Int. Ed. **2010**, 49, 9652
- Chem. Mater. **2015**, 27, 8237
- ACS Catalysis. **2016**, 6, 2770
- ChemSusChem **2012**, 5, 85
- Green Chem., **2016**, 18, 5890
- Angew. Chem. Int. Ed. **2011**, 50, 2747
- RSC Adv., **2017**, 7, 24885
- Langmuir **2014**, 30, 10886
- J. Mater. Chem. B, **2015**, 3, 3201

OTHER KITS - Biological Hydrogen Peroxide Imaging Kit (FBBBE, CBBE)

96-0350

Biological Hydrogen Peroxide Imaging Kit (FBBBE, CBBE)

Includes:

6 x 1.0ml Dimethylsulfoxide (ACS spectrophotometric grade): 97-4940

05-0058 FBBBE: 3 x 5mg

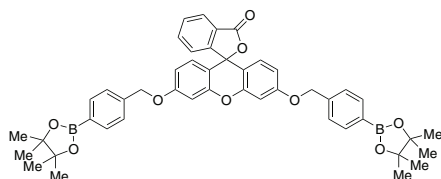
05-0054 CBBE: 3 x 5mg

Sold under license from The Regents of the University of California. US Patent application 61/762,706. Components also available for individual sale. Contains the following:

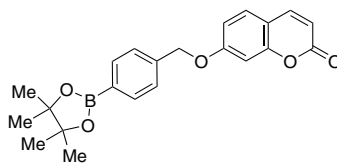
05-0054	7-([(4,4,5,5-Tetramethyl-1,3,2-dioxaborolan-2-yl)benzyl]oxy)-2H-1-benzopyran-2-one CBBE (1522117-80-1)	5mg
05-0058	3',6'-Bis([(4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)oxy]-3H-[spiro(isobenzofuran-1,9,-xanthen)-3-one] FBBBE (1522117-83-4)	5mg

Active Ingredients: Catalog # 05-0058 Fluorescein bis(benzyl boronic ester) **FBBE**

Catalog # 05-0054 Coumarin benzyl boronic ester **CBBE**



05-0058 FBBE



05-0054 CBBE

Introduction:	FBBBE and CBBE are robust fluorescent probes, effective for imaging hydrogen peroxide in biological settings. In the supplied form, the fluorescence signal is effectively quenched by the addition of the benzyl ether boronic ester protecting groups to the fluorophores. In the presence of biologically relevant levels of hydrogen peroxide (10-200 :M), the protecting groups cleave and a strong fluorescent signal is observed. (FBBBE: λ_{exc} = 480 nm, λ_{em} = 512 nm; CBBE: λ_{exc} = 370 nm, λ_{em} = 450 nm) 1. <i>ChemBioChem</i>, 2013, 14, 593.
Contents:	FBBBE: 3x5mg CBBE: 3x5mg Dimethylsulfoxide (ACS spectrophotometric grade): 6 x 1.0mL
SDS:	The Safety Data Sheets for the three products contained in this kit can be downloaded from the Strem Chemicals Web Site at www.strem.com. Locate the SDS using the following catalog numbers: FBBBE: 05-0058 CBBE: 05-0054 Dimethylsulfoxide (ACS spectrophotometric grade): 97-4940
Storage Conditions:	Both compounds are stable at ambient conditions for several days. For long term storage, the kit should be stored at -20°C and protected from light.

Preparation of FBBBE:	Step 1: Add 654 μL of DMSO to 5.0mg of FBBE (MW: 764.3 g/mol) (resulting concentration = 10 mM). FBBBE is readily soluble in DMSO. The solution can be portioned into 50 μL aliquots as needed. These solutions must be stored in the freezer at < -20°C. Step 2: Add 50 μL of 10 mM stock to 50 μL DMSO (resulting concentration = 5 mM). This stock solution can be stored in the freezer at < -20°C. Step 3: This solution can be further diluted to the desired concentration in buffer. For example add 10μL of the 5 mM stock solution to 990μL 1X PBS, resulting in a 50 μM solution (this solution should be used the same day in which it was prepared). This will result in a solution containing only 1% DMSO (v/v). This solution can then be used in the biological setting to image H₂O₂.
Preparation of CBBE:	Step 1: Add 661 L of DMSO to 5.0 mg CBBE (MW: 378.2 g/mol) (resulting concentration = 20 mM). Vortex until all solid has been thoroughly dissolved. The solution can be portioned into 50 μL aliquots as needed. These solutions must be stored in the freezer at < -20°C. Step 2: Add 50 μL of 20 mM stock to 150 μL DMSO (resulting concentration = 5 mM). This stock solution can be stored in the freezer at < -20°C. Step 3: The solution can be further diluted to the desired concentration in buffer. For example add 10 μL of the 5 mM stock solution to 990 μL 1X PBS, resulting in a 50μM solution (this solution should be used the same day in which it was prepared). This will result in a solution containing only 1% DMSO (v/v). This solution can then be used to image H₂O₂ in the biological setting.

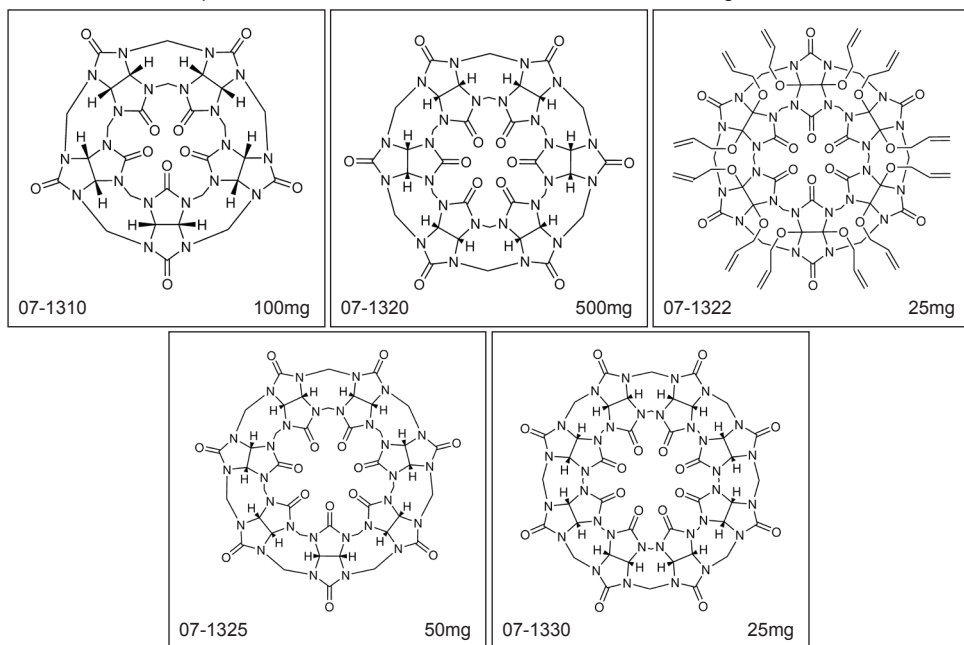
OTHER KITS - Cucurbituril Kit

96-7054

Cucurbituril Kit

Sold for research purposes only. US 6365734, US 7388099.

Components also available for individual sale. Contains the following:



07-1310	Cucurbit[5]uril (CB[5]) ammonium sulfate hydrate, 99+% (259886-49-2)	100mg
07-1320	Cucurbit[6]uril (CB[6]) hydrate, 99+% (80262-44-8)	500mg
07-1322	Perallyloxycucurbit[6]uril (AOCB[6]) potassium sulfate, 94+% (558445-90-2)	25mg
07-1325	Cucurbit[7]uril (CB[7]) hydrate, 99+% (259886-50-5)	50mg
07-1330	Cucurbit[8]uril (CB[8]) hydrate, 99+% (259886-51-6)	25mg

OTHER KITS - Enzyme Carrier Lifetech™ ECRKIT1

96-0255

Enzyme carrier Lifetech™ ECRKIT1

Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; This enzyme carrier kit allows rapid screening of different methods of enzyme immobilization. Sold in collaboration with Purolite for research purposes only.

Components also available for individual sale. Contains the following:

06-0810	Enzyme carrier Lifetech™ ECR8204F	50g
06-0828	Enzyme carrier Lifetech™ ECR8285	50g
06-0913	Enzyme carrier Lifetech™ ECR1090M	50g
06-0925	Enzyme carrier Lifetech™ ECR1030M	50g
07-1512	Enzyme carrier Lifetech™ ECR8309F	50g
07-1532	Enzyme carrier Lifetech™ ECR8806F	50g

OTHER KITS - Long-Chain n-Alkylphosphonic Acid Kit

96-1525

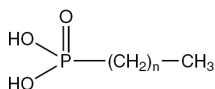
Long-Chain n-Alkylphosphonic Acid Kit

Components also available for individual sale. Contains the following:

15-0958	n-Decylphosphonic acid, min. 97% (6874-60-8)	1g
15-1835	n-Dodecylphosphonic acid, min. 97% DDPA (5137-70-2)	1g
15-2400	n-Hexadecylphosphonic acid, min. 97% HDPA (4721-17-9)	1g
15-2410	n-Hexylphosphonic acid, min. 97% HPA (4721-24-8)	1g
15-3510	n-Octadecylphosphonic acid, min. 97% ODPa (4724-47-4)	1g
15-3520	n-Octylphosphonic acid, min. 97% OPA (4724-48-5)	1g
15-5145	n-Tetradecylphosphonic acid, min. 97% TDPA (4671-75-4)	1g

General Use:

Linear alkyl Phosphonic acids and their phosphonate salts are surfactants because of their classic bifunctional chemical structure, $RP(O)(OH)_2$, consisting of both non-polar organic hydrophobic groups and anionic inorganic hydrophilic groups. Like the related alkyl sulfonates, they are used as detergents, dispersants, emulsifiers, and chelating agents. Alkyl phosphonic acids are typically sparingly soluble in both organic solvents and water, but become more soluble in water when neutralized to phosphonates at neutral to high pH.



n=5-17

OTHER KITS - Nitric Oxide Sensor (Extracellular) Kit ("NO-ON") (FL2A)

96-0397

Nitric Oxide Sensor (Extracellular) Kit ("NO-ON") (FL2A)

(Cell-impermeable NO fluorescent probe)

Includes:

5 x 1ml Dimethylsulfoxide (ACS spectrophotometric grade): 97-4940

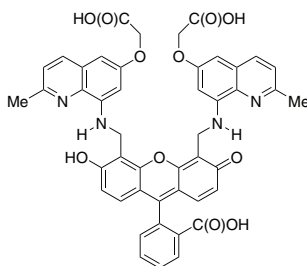
5 x 1ml Copper (II) chloride as a 1.0 mM solution in water: 97-3060

07-0287 packaged as 5 x 0.5mg

Components also available for individual sale. Contains the following:

07-0287	2-{4,5-Bis[(6-(2-ethoxy-2-oxohydroxy)-2-methylquinolin-8-ylamino)methyl]-6-hydroxy-3-oxo-3H-xanthen-9-yl}benzoic acid FL2A (1239877-07-6)	0.5mg
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Active Ingredients: 2-{4,5-Bis[(6-(2-ethoxy-2-oxoethoxy)-2-methylquinolin-8-ylamino)methyl]-6-hydroxy-3-oxo-3H-xanthen-9-yl}benzoic acid FL2A



07-0287

OTHER KITS - Nitric Oxide Sensor (Extracellular) Kit ("NO-ON") (FL2A)

96-0397 Nitric Oxide Sensor (Extracellular) Kit ("NO-ON") (FL2A)
(continued) (Cell-impermeable NO fluorescent probe)

Introduction:	The copper complex of FL2A is a novel, cell-trappable fluorescent NO probe, that allows direct imaging of nitric oxide produced in living cells through fluorescence turn on. The FL2A ligand is trapped in the cell. A solution of the copper (II) complex of FL2A can be readily prepared using this kit. For additional information, consult the following references: 1. <i>Inorg. Chem.</i> , 2010 , 49, 7464. 2. <i>PNAS</i> , 2010 , 107, 8525.
Contents:	Ligand FL2A : 5 x 0.5mg Dimethylsulfoxide (ACS spectrophotometric grade): 5 x 1.0ml Copper (II) chloride (1.0 mM solution in water): 5 x 1.0ml
SDS:	The Safety Data Sheets for the three products contained in this kit can be downloaded from the Strem Chemical website, www.strem.com . Locate the SDS using the following catalog numbers: 07-0287: FL2A 97-4940: Dimethylsulfoxide (ACS spectrophotometric grade) 97-3060: Copper (II) chloride as a 1.0 mM solution in water

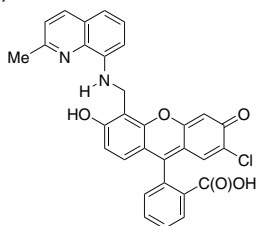
Storage Conditions:	This kit should be stored at -20°C and protected from light.
Preparation of the active copper complex of FL2A:	Step 1: Allow the kit to warm to room temperature. Add 589 microliters of DMSO to a 0.5mg vial of FL2A (resulting concentration -1.0 mM). The FL2A is readily soluble in the DMSO. The solution can be partitioned into aliquots of 40-300 µL as required. These solutions must be stored in the freezer at <-20°C. The DMSO solution of FL2A is stable for three months at -80°C. It is advisable to check the extinction coefficient of the solution before preparing the copper complex. ($\log \epsilon(499 \text{ nm}) = 4.66$) Step 2: A CuFL2A solution should be freshly prepared by adding 1:2 FL2A solution (1.0 mM) to the copper (II) solution (1.0 mM) at room temperature. Note: The prepared DMSO/water stock solution of CuFL2A solution [$\log \epsilon(495 \text{ nm}) = 4.19$] can be kept at room temperature, but should be protected from light. The solution can be diluted with media to provide the concentration required for cell sensing experiments. When the extinction coefficient of the red solution of CuFL2A diminishes by 20% of the original value, the solution should be discarded. Do not use the solution after 1 hour and do not freeze the solution.

OTHER KITS - Nitric Oxide Sensor (Intracellular) Kit ("NO-ON") (FL)

96-0293	Nitric Oxide Sensor (Intracellular) Kit ("NO-ON") (FL) (Cell-trappable NO fluorescent probe) Includes: 5 x 1ml Dimethylsulfoxide (ACS spectrophotometric grade): 97-4940 5 x 1ml Copper (II) chloride as a 1.0 mM solution in water: 97-3060 07-0293 packaged as 5 x 0.5mg Components also available for individual sale. Contains the following:
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07-0293	2-{2-Chloro-6-hydroxy-5-[2-methylquinolin-8-ylaminomethyl]-3-oxo-3H-xanthen-9-yl}benzoic acid FL (905982-78-7)	0.5mg
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Active Ingredients: 2-{2-Chloro-6-hydroxy-5-[2-methylquinolin-8-ylamino)methyl]-3-oxo-3H-xanthen-9-yl}benzoic acid (FL)



07-0293

Introduction:	The copper complex of FL is a novel, cell-trappable fluorescent NO probe that allows direct imaging of nitric oxide produced in living cells through fluorescence turn on. A solution of the copper (II) complex of FL can be readily prepared using this kit. For additional information, consult the following references: 1. <i>Nature Chemical Biology</i> , 2006 , 2, 375. 2. <i>Nature Protocols</i> , 2007 , 2, 408. 3. <i>J. Am. Chem. Soc.</i> , 2006 , 128, 14364
Contents:	Ligand FL: 5 x 0.5mg Dimethylsulfoxide (ACS spectrophotometric grade): 5 x 1.0ml Copper (II) chloride (1.0 mM solution in water): 5 x 1.0ml
SDS:	The Safety Data Sheets for the three products contained in this kit can be downloaded from the Strem Chemical website, www.strem.com . Locate the SDS using the following catalog numbers: 07-0293: FL 97-4940: Dimethylsulfoxide (ACS spectrophotometric grade) 97-3060: Copper (II) chloride as a 1.0 mM solution in water

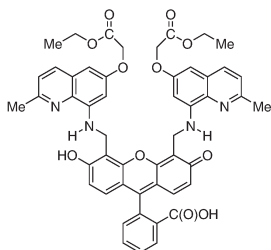
Storage Conditions:	This kit should be stored at -20°C and protected from light.
Preparation of the active copper complex of FL:	Step 1: Allow the kit to warm to room temperature. Add 931 microliters of DMSO to a 0.5mg vial of FL (resulting concentration -1.0 mM). The FL is readily soluble in the DMSO. The solution can be partitioned into aliquots of 40-300 µL as required. These solutions must be stored in the freezer at <-20°C. The DMSO solution of FL is stable for three months at -80°C. It is advisable to check the extinction coefficient of the solution before preparing the copper complex. (log ε(504 nm) = 4.62) Step 2: A CuFL solution should be freshly prepared by adding 1:1 FL solution (1.0 mM) to the copper (II) solution (1.0 mM) at room temperature. Note: The prepared DMSO/water stock solution of CuFL solution [log ε(499 nm) = 4.60] can be kept at room temperature, but should be protected from light. The solution can be diluted with media to provide the concentration required for cell sensing experiments. When the extinction coefficient of the red solution of CuFL diminishes by 20% of the original value, the solution should be discarded. Do not use the solution after 1 hour, and do not freeze the solution.

OTHER KITS - Nitric Oxide Sensor (Intracellular) Kit ("NO-ON") (FL2E)

96-0396 Nitric Oxide Sensor (Intracellular) Kit ("NO-ON") (FL2E) (Cell-trappable NO fluorescent probe)
 Includes:
 5 x 1ml Dimethylsulfoxide (ACS spectrophotometric grade): 97-4940
 5 x 1ml Copper (II) chloride as a 1.0 mM solution in water: 97-3060
 07-0291 packaged as 5 x 0.5mg
 Components also available for individual sale. Contains the following:

07-0291	2-[4,5-Bis[(6-(2-ethoxy-2-oxoethoxy)-2-methylquinolin-8-ylamino)methyl]-6-hydroxy-3-oxo-3H-xanthen-9-yl]benzoic acid FL2E (1239877-06-5)	0.5mg
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Active Ingredients: 2-[4,5-Bis[(6-(2-ethoxy-2-oxoethoxy)-2-methylquinolin-8-ylamino)methyl]-6-hydroxy-3-oxo-3H-xanthen-9-yl]benzoic acid FL2E



07-0291

Introduction:	The copper complex of FL2E is a novel, cell-trappable fluorescent NO probe, that allows direct imaging of nitric oxide produced in living cells through fluorescence turn on. The FL2E ligand is trapped in the cell. A solution of the copper (II) complex of FL2E can be readily prepared using this kit. For additional information, consult the following references: 1. <i>Inorg. Chem.</i> , 2010 , 49, 7464.
Contents:	Ligand FL2E : 5 x 0.5mg Dimethylsulfoxide (ACS spectrophotometric grade): 5 x 1.0ml Copper (II) chloride (1.0 mM solution in water): 5 x 1.0ml
SDS:	The Safety Data Sheets for the three products contained in this kit can be downloaded from the Strem Chemical website, www.strem.com . Locate the SDS using the following catalog numbers: 07-0291: FL2E 97-4940: Dimethylsulfoxide (ACS spectrophotometric grade) 97-3060: Copper (II) chloride as a 1.0 mM solution in water
Storage Conditions:	This kit should be stored at -20°C and protected from light.

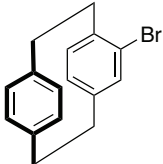
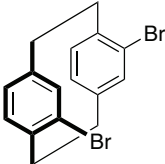
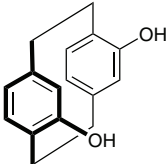
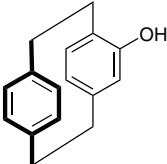
Preparation of the active copper complex of FL2E:	Step 1: Allow the kit to warm to room temperature. Add 571 microliters of DMSO to a 0.5mg vial of FL2E (resulting concentration -1.0 mM). The FL2E is readily soluble in the DMSO. The solution can be partitioned into aliquots of 40-300 μL as required. These solutions must be stored in the freezer at <-20°C. The DMSO solution of FL2E is stable for three months at -80°C. It is advisable to check the extinction coefficient of the solution before preparing the copper complex. ($\log \epsilon(500 \text{ nm}) = 4.25$) Step 2: A CuFL2E solution should be freshly prepared by adding 1:1 FL2E solution (1.0 mM) to the copper (II) solution (1.0 mM) at room temperature. Note: The prepared DMSO/water stock solution of CuFL2E solution [$\log \epsilon(496 \text{ nm}) = 4.05$] can be kept at room temperature, but should be protected from light. The solution can be diluted with media to provide the concentration required for cell sensing experiments. When the extinction coefficient of the red solution of CuFL2E diminishes by 20% of the original value, the solution should be discarded. Do not use the solution after 1 hour, and do not freeze the solution.
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OTHER KITS - Paracyclophane Kit

96-7052

Paracyclophane Kit

Components also available for individual sale. Contains the following:

	06-0104	500mg		06-0460	250mg		08-0700	100mg		08-2027	250mg
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06-0104	racemic-4-Bromo[2.2]paracyclophane, min. 95% (1908-61-8)	500mg
06-0460	racemic-4,12-Dibromo[2.2]paracyclophane, min. 95% (23927-40-4)	250mg
08-0700	racemic-4,12-Dihydroxy[2.2]paracyclophane, min. 97% (612492-27-0)	100mg
08-2027	racemic-4-Hydroxy[2.2]paracyclophane, min. 97% (157018-15-0)	250mg

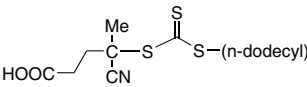
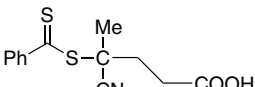
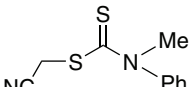
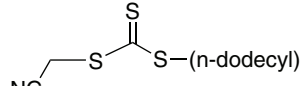
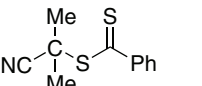
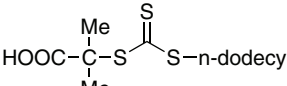
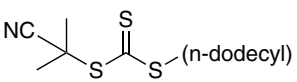
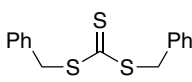
OTHER KITS - RAFT Agent Kit

96-4700

RAFT Agent Kit for controlling polymerizations at the molecular level

Sold for research purposes only under license from CSIRO.

Components also available for individual sale. Contains the following:

	16-0415	500mg		16-0422	500mg		16-0423	500mg
	16-0425	500mg		16-0430	500mg		16-0460	500mg
	16-0610	500mg		16-0617	500mg			

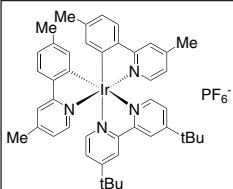
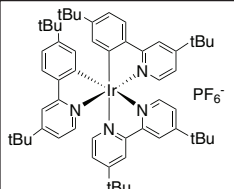
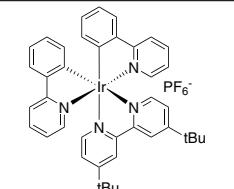
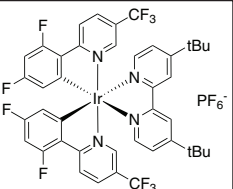
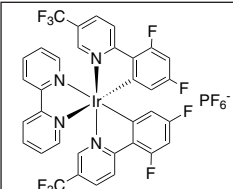
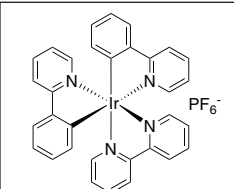
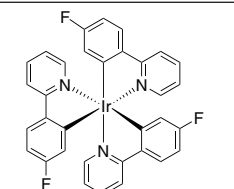
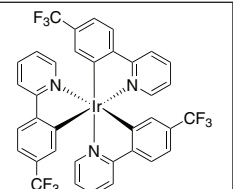
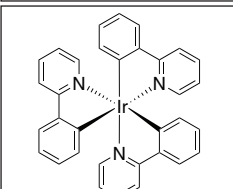
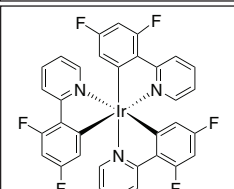
PHOTOCATALYST KITS - Iridium Photocatalyst Kit 1

96-7780

Iridium Photocatalyst Kit 1

NEW

Components also available for individual sale. Contains the following:

 77-0218 50mg	 77-0285 50mg	 77-0410 100mg	 77-0425 50mg
 77-0453 50mg	 77-0465 100mg	 77-6100 50mg	 77-6580 50mg
 77-7015 50mg	 77-7030 50mg		

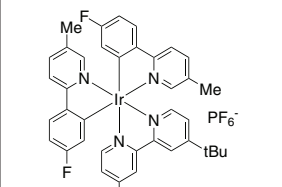
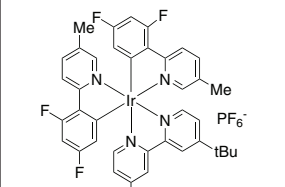
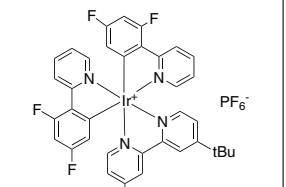
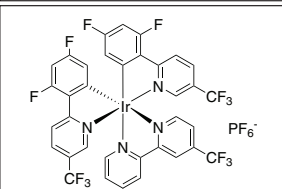
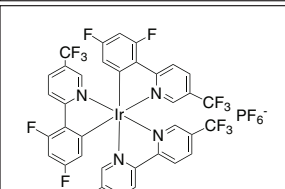
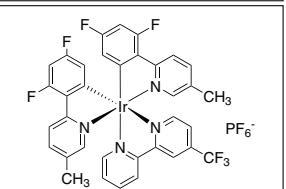
PHOTOCATALYST KITS - Iridium Photocatalyst Kit 2

96-7790

Iridium Photocatalyst Kit 2

NEW

Components also available for individual sale. Contains the following:

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 77-0360 50mg	 77-0370 50mg	 77-0380 50mg

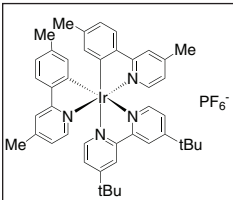
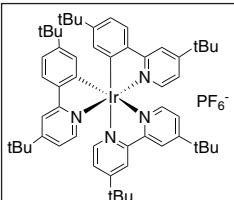
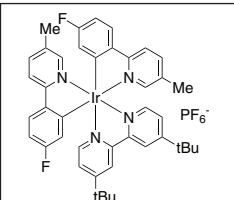
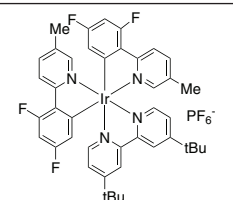
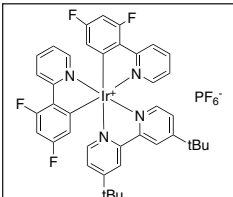
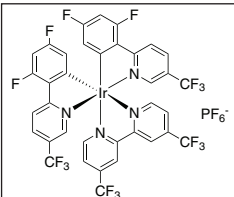
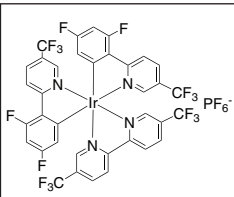
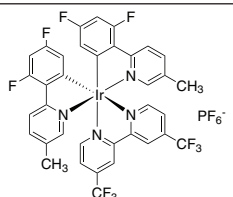
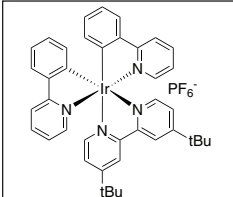
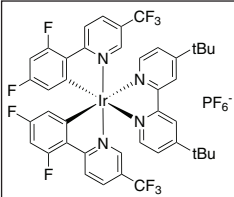
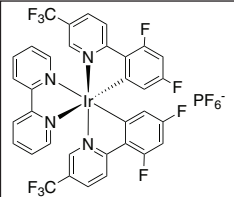
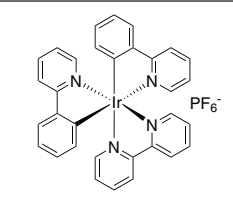
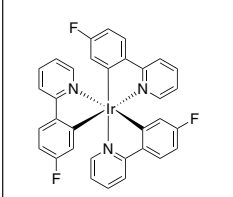
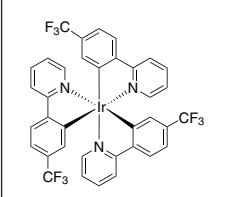
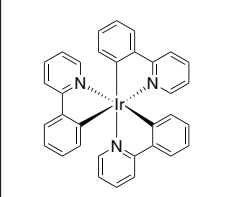
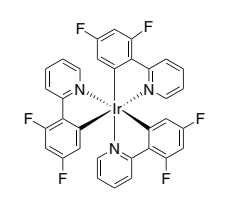
PHOTOCATALYST KITS - Iridium Photocatalyst Master Kit

96-7795

Iridium Photocatalyst Master Kit

NEW

Components also available for individual sale. Contains the following:

 77-0218 50mg	 77-0285 50mg	 77-0320 50mg	 77-0330 100mg
 77-0350 100mg	 77-0360 50mg	 77-0370 50mg	 77-0380 50mg
 77-0410 100mg	 77-0425 50mg	 77-0453 50mg	 77-0465 100mg
 77-6100 50mg	 77-6580 50mg	 77-7015 50mg	 77-7030 50mg

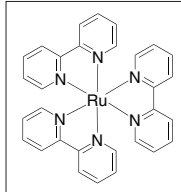
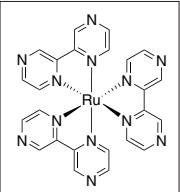
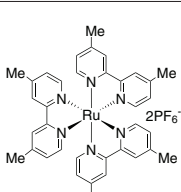
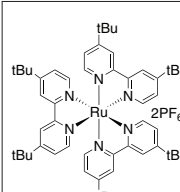
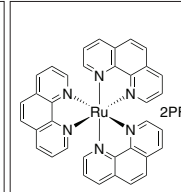
PHOTOCATALYST KITS - Ruthenium Photocatalyst Kit

96-4450

Ruthenium Photocatalyst Kit

NEW

Components also available for individual sale. Contains the following:

 44-7900 250mg	 44-7910 50mg	 44-7930 50mg	 44-7940 50mg	 44-7955 50mg
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PHOTOCATALYST KITS - EvoluChem™ Photochemical Methylation Array Kit

96-7510

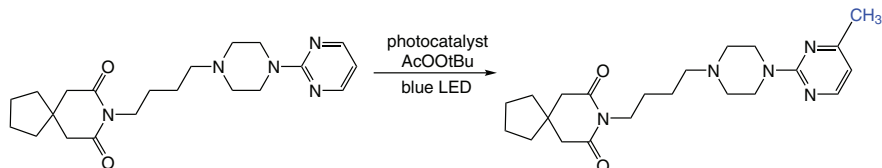
EvoluChem™ Photochemical Methylation Array Kit

1 kit

NEW

Note: Sold in collaboration with HepatoChem

This kit and the PhotoRedOx Box (98-7500) work together seamlessly.



Reference: *Chem. Soc. Rev.*, **2016**, *45*, 546-576

Kit Protocol:

The typical protocol is performed in a 0.05 Mol/l concentration reaction condition using a substrate solution of four different solvents. Each sealed reaction vial contains 0.1 μmol of photocatalyst and 12.5 μmol of *tert*-butyl peracetate. Based on the concentration of the substrate stock solution and the volume added, the following reaction stoichiometry can be achieved with the standard photomethylation kit.

	77-0425	77-0410
50/50 Acetonitrile/TFA	5 equiv. <i>tert</i> -butyl peracetic acid	
Acetonitrile (10 equiv. TFA)		
Acetic acid (10 equiv. TFA)		
Acetic acid/H ₂ O (10 equiv. TFA)		

Kit contents:

Description	Quantity	Amount
(4,4'-Di- <i>t</i> -butyl-2,2'-bipyridine)bis[3,5-difluoro-2-[5-trifluoromethyl-2-pyridinyl- <i>k</i> N]phenyl- <i>k</i> C]iridium(III) hexafluorophosphate, 99% Item # 77-0425	8 vials	0.1 μmol/12.5 μmol
(4,4'-Di- <i>t</i> -butyl-2,2'-bipyridine)bis[2-(2-pyridinyl- <i>k</i> N)phenyl- <i>k</i> C]iridium(III) hexafluorophosphate, 99% Item # 77-0410	8 vials	0.1 μmol/12.5 μmol
50/50 Acetonitrile/ trifluoroacetic acid	1 vial	1 ml
Acetonitrile (10 equiv. trifluoroacetic acid*)	1 vial	1 ml
Acetic acid (10 equiv. trifluoroacetic acid*)	1 vial	1 ml
Acetic acid/water (10 equiv. trifluoroacetic acid*)	1 vial	1 ml
Substrate stock vial 1	1 vial	--
Substrate stock vial 2	1 vial	--
Substrate stock vial 3	1 vial	--
Substrate stock vial 4	1 vial	--

PHOTOCATALYST KITS - EvoluChem™ Photocatalytic Alkylation Kit

96-7560

EvoluChem™ Photocatalytic Alkylation Kit

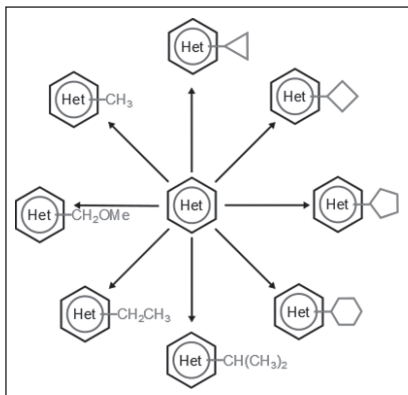
1 kit

NEW

Note: Sold in collaboration with HepatoChem

Product Overview:

The trifluoroborate alkylation reaction (Minisci reaction)¹ is a powerful late stage functionalization tool. Our kit allows convenient, one-step production of eight different analogues of a lead compound in mg quantities. Each reaction vial contains 75 μ mol of trifluoroborate alkylation reagent (pre-weighed) and a stirring bar to react with 50 μ mol of substrate. C-H functionalization will primarily occur on electron-deficient heteroarenes at one or several positions.



Kit Contents (16 reaction vials total):

- 2 reaction vials of BF_3K reagents (75 μ mol)
- 2 reaction vials of $\text{K}_2\text{S}_2\text{O}_8$ (100 μ mol)
- 2 vials of photocatalysts
- 2 vials of TFA

Kit Protocol:

For each kit, 4mL of a 0.1 M solution of substrate (400 μ mol total) in DMSO is prepared with 8.98 mg photocatalyst $\text{Ir}(\text{dF-CF}_3\text{-ppy})_2(\text{dtbbpy})$ (77-0425) (8 μ mol, 2 mol%) and trifluoroacetic acid (153 μ L, 5 equiv) included. The solution is sparged with nitrogen. Each vial contains 27.0mg $\text{K}_2\text{S}_2\text{O}_8$ (100 μ mol, 2 equiv.) and 1.5 equiv. BF_3K reagent (75 μ mol) in 2ml vials equipped with a stir bar and Teflon septa. Alternatively for methylation, vials contain

39.9 μ L of tert-butyl peracetate (TBPA). Vials are prepared under argon. 500 μ L of substrate solution is added via syringe and the vial is placed in PhotoRedOx Box (98-7500) equipped with light source. Reaction is stirred for 2-24 hr.

Photocatalytic Alkylation Reagents (2 Vials of each)

	cyclopropyl	cyclobutyl	cyclopentyl	cyclohexyl	ethyl	isopropyl	methoxy methyl	t-butyl peracetate
MW (g/mol)	147.98	162.00	176.03	190.06	135.97	149.99	151.97	132.16
CAS #	1065010-87-8	1065010-88-9	1040745-70-7	446065-11-8	44248-07-9	1041642-13-0	910251-11-5	107-71-1

References:

1. *Chem. Sci.*, **2017**, 8 (39), 3512-3522
2. *Chem. Soc. Rev.*, **2016**, 45, 546-576

PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel Photoredox Kits

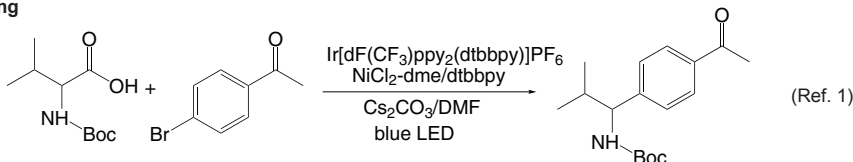
Iridium/Nickel Photoredox Kits

Photoredox chemistry has been reported in literature using a wide range of catalysts and reagents. However, often these reactions are highly substrate, solvent and base specific. In order to facilitate the screening of common photochemistry reactions, HepatoChem has released a series of kits combining common Iridium, Nickel, ligand and base combinations to achieve successful cross-coupling transformations.

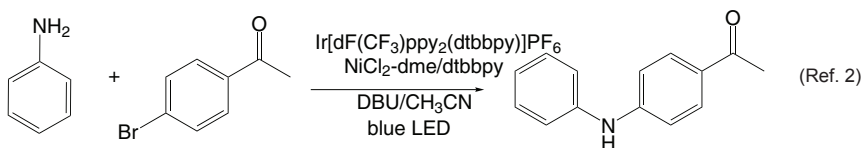
Ir/Ni catalysis versatility

Depending on the ligand, base and solvent, the Ir/Ni catalytic systems can perform different cross-coupling reaction.

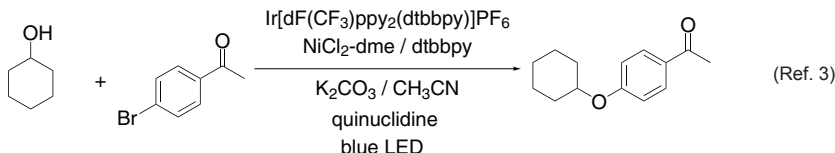
C-C Coupling



C-N Coupling



C-O Coupling



Several Kits Available

Standard Protocol:

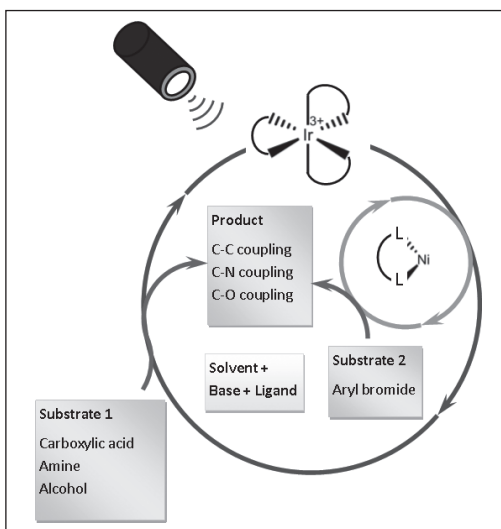
5 μmol of substrates in 100 μl solvent with Ir catalyst (2 mol %), $\text{NiCl}_2\cdot\text{dme}$ (10 mol %), ligand (10 mol %), and 3 equivalent of base.

Features:

- 0.3ml vial with crimp cap and stirring bar
- Specifically designed for photochemistry device
- Pre-weighed reagents and catalysts
- Temperature maintained at RT
- Pre-designed or custom arrays available
- Reagents are packaged under inert atmosphere

References

1. *Science* **2014**, 345, 437-440
2. *Angew. Chemie*, **2016**, 55, 13219-13223
3. *Nature* **2015**, 524, 330-334



PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel Photoredox Kits

Iridium/Nickel Photoredox Kits (*continued*)

Results summary:

Selection of base and solvent is important to find the condition for appropriate coupling (5μmol per reaction/100μL scale)

Reaction Type	Substrates	Solvent	Base			
			Cs ₂ CO ₃	K ₃ PO ₄	DABCO	DBU
C-C coupling through decarboxylation	Boc-Val 4-bromoacetophenone	DMF	✓	✓		
C-N coupling (secondary amines)	Pyrolidine 4-bromoacetophenone	DMA			✓	
C-N coupling (aromatic amine/secondary amine)	Indoline 4-bromoacetophenone	DMA		✓		
C-N coupling (aromatic amine)	Aniline 4-bromoacetophenone	ACN			✓	✓

PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel PhotoRedOx Base and Solvent Screening Kit 1

96-7520

EvoluChem™ Iridium/Nickel PhotoRedOx Base and Solvent Screening Kit 1

1 kit

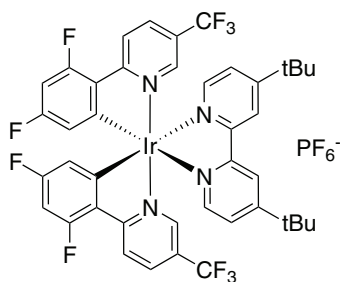
NEW

Note: Sold in collaboration with HepatoChem

Kit Contents:

This kit contains 77-0425 (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)

	Cs ₂ CO ₃	K ₃ PO ₄	K ₂ HPO ₄	KOH	Li ₂ CO ₃	K ₂ CO ₃	DABCO	DBU
Solvent A	2 sets of 8 conditions with 8 different bases per kit (16 total vials) 5 μmol of substrates in 100 μl solvent 77-0425 (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)							
Solvent B								



Iridium Catalyst: 77-0425

Suggested Solvents (*not included*)

1. ACN
2. DMF
3. DMA
4. DMSO

PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel PhotoRedOx Base and Ligand Screening Kit 2

96-7530

EvoluChem™ Iridium/Nickel PhotoRedOx Base and Ligand Screening Kit 2

1 kit

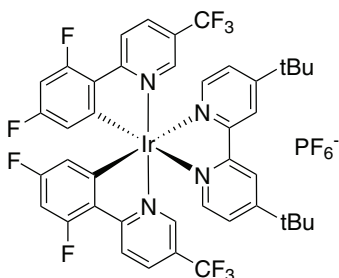
NEW

Note: Sold in collaboration with HepatoChem

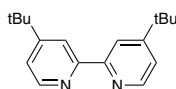
Kit Contents:

This kit contains 77-0425 (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)

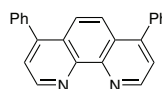
	Cs_2CO_3	K_3PO_4	K_2HPO_4	K_2CO_3
dtbbpy	2 sets of 16 conditions with 4 bases and 4 ligands per kit (32 total vials) 5 μmol of substrates in 100 μl solvent 77-0425 (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)			
bphen				
$(\text{MeO})_2\text{bpy}$				
biox				



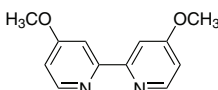
Iridium Catalyst: 77-0425



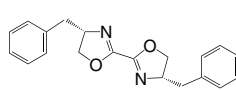
Nitrogen Ligand: dtbbpy



Nitrogen Ligand: bphen



Nitrogen Ligand: $(\text{MeO})_2\text{bpy}$



Nitrogen Ligand: biox

PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel PhotoRedOx Base and Ligand Screening Kit 3

96-7540

EvoluChem™ Iridium/Nickel PhotoRedOx Base and Ligand Screening Kit 3

1 kit

NEW

Note: Sold in collaboration with HepatoChem

Kit Contents:

This kit contains 77-0425 (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)

	Cs_2CO_3	K_3PO_4	K_2HPO_4	K_2CO_3	DABCO	DBU
dtbbpy	2 sets of 24 conditions with 6 bases and 4 ligands per kit (48 total vials) 5 μmol of substrates in 100 μl solvent 77-0425 (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)					
bphen						
$(\text{MeO})_2\text{bpy}$						
biox						

See catalyst and ligand structures with 96-7530.

PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel PhotoRedOx Base and Iridium Catalyst Screening Kit

96-7550

EvoluChem™ Iridium/Nickel PhotoRedOx Base and Iridium Catalyst Screening Kit

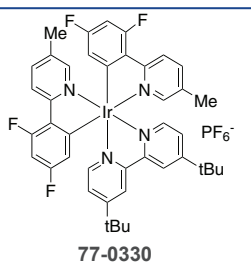
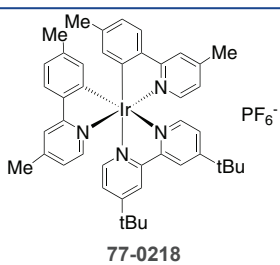
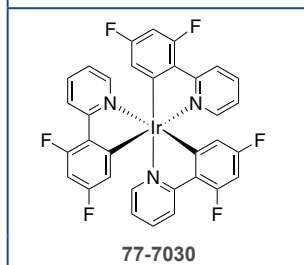
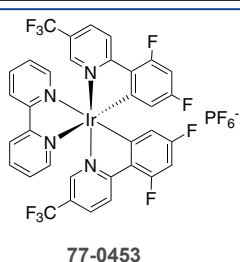
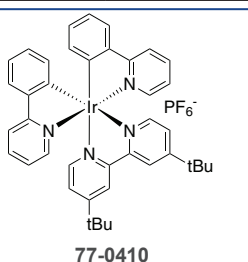
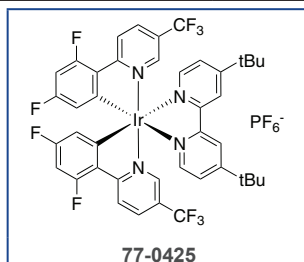
Note: Sold in collaboration with HepatoChem

NEW

Kit Contents:

This kit contains Ir catalyst (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)

	Cs ₂ CO ₃	CsF	DBU
77-0425	2 sets of 18 conditions with 3 bases and 6 Ir catalysts per kit (36 total vials) 5 μmol of substrates in 100 μl solvent Ir catalyst (2 mol%), Ni/Ligand (10 mol%) and base (3 eq)		
77-0410			
77-0453			
77-7030			
77-0218			
77-0330			



PHOTOCATALYST KITS - EvoluChem™ Iridium/Nickel PhotoRedOx Base and Solvent Screening Kit (C-O coupling)

96-7570

EvoluChem™ Iridium/Nickel PhotoRedOx Base and Solvent Screening Kit 2 (C-O coupling)

Note: Sold in collaboration with HepatoChem

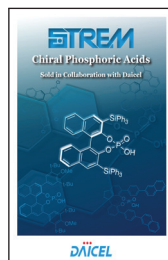
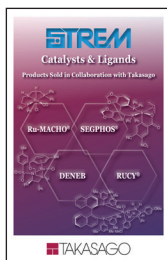
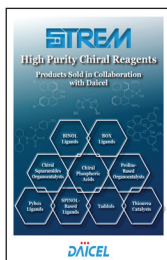
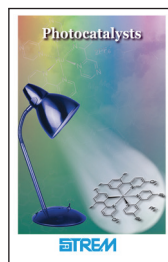
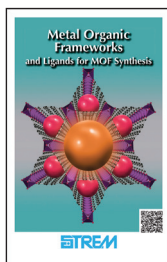
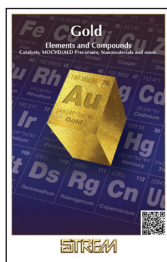
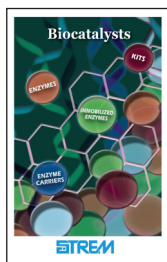
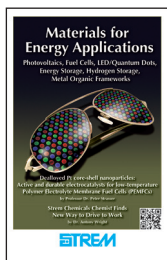
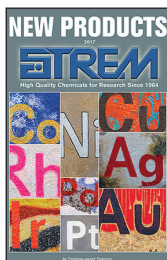
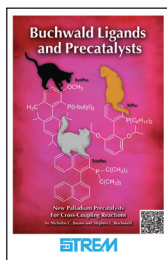
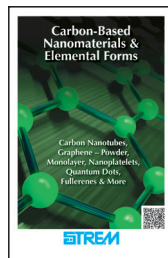
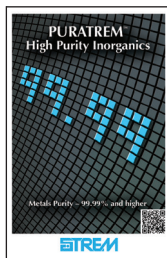
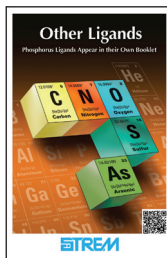
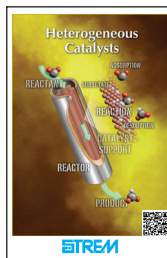
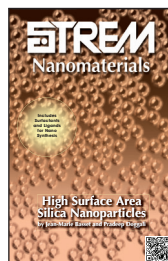
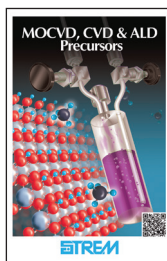
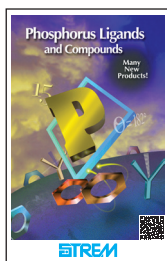
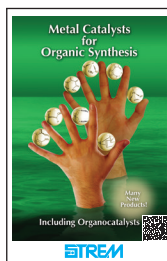
NEW

Kit Contents:

This kit contains 2 sets of 8 reaction conditions per kit (16 total vials) with 77-0425 (1 mol%), Ni/Ligand and quinuclidine

Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6	Condition 7	Condition 8
Cs ₂ CO ₃ 1.5 eq.	K ₃ PO ₄ 1.5 eq.	K ₂ CO ₃ 1.5 eq.	K ₂ CO ₃ 1.5 eq.	K ₂ CO ₃ 1.5 eq.	DABCO 1.5 eq.	Quinuclidine 1.5 eq.	No Base Control
NiCl ₂ -dme/ dtbbpy 5 mol%	NiCl ₂ -dme/ dtbbpy 5 mol%	NiCl ₂ -dme/ dtbbpy 5 mol%	NiCl ₂ -dme/ dtbbpy 2.5 mol%	NiCl ₂ -dme/ dtbbpy 1.25 mol%	NiCl ₂ -dme/ dtbbpy 5 mol%	NiCl ₂ -dme/ dtbbpy 5 mol%	NiCl ₂ -dme/ dtbbpy 5 mol%
Quinuclidine 10 mol%							
77-0425 1 mol%							

Available Booklets



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