

Your Dependable Chemistry Partner

Customized Chemistry From Milligrams to Metric Tons

+1 215 367 5129

sales@glsyntech.com

www.glsyntech.com

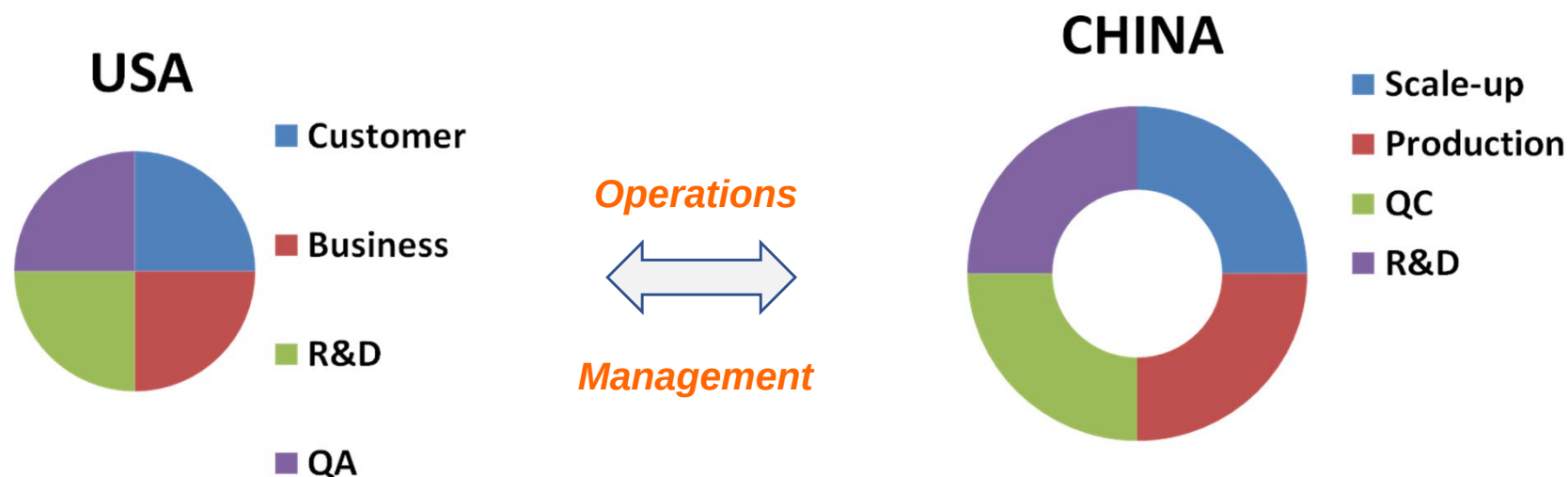
A Member of BHW Tech Group

Overview

- **USA-based Chemistry Technology Developer and Custom Manufacturer Nurturing New Drug/Product Discovery, Development, and Manufacturing**
- **Client Recognition Globally, with 27+ Yrs Extensive Experience in Chemistry Know-how, Pharma Chemistry Services, Proprietary Processes, and Custom Manufacturing**
- **State-of-the-art R&D Centers in USA & China, and GMP Like Manufacturing Plants in China, Enabling Reliable Manufacturing and Supply of Challenging Pharmaceuticals**
- **Inhouse Process Expertise in *Fluorinations, Hetero-cyclizations, Boronic Acids/Esters, Protected Amino Acids, Lab Reference Compounds, High-purity Omega-3 Products***
- **Expanding Target Custom Products, Specialty Reagents, Biocatalyst Technology Platform, and Industrial Catalyst Chemistries**
- **Strategic Commercialization of High-purity Omega-3 Products (GMP & non-GMP)**
- **Strategic Business Partnership with Chemgo Ag (Switzerland and France)**
- **Well Positioned Offering One-Stop Full-Spectrum Chemistry Solutions**

Our Business Model

- Chemistry and Technology from Milligrams to Metric Tons
- Serving both **Pharmaceuticals/Biotech/Human Health/Life Science** and **Specialty & Agro Chemical Industries**
- A Privately Held USA Company with Manufacturing in China



- Direct to Market/Customer
- Direct to Regulation/Legislation/Liability
- Technology Leadership

- Cost Advantage/Rich Resource
- Scale of Economy Factor
- Growing China Market

Industry and Business Focus



A Member of BHWTech Group

- **Pharma/Biotech Industry Focused**

- Small Molecular Custom Synthesis (FFS and FTE)
- Custom Manufacturing
- Established Custom Products
- Inhouse Know-how Processes Enabling New API Development
- Unique Product Classes – Fluoro Aromatics, Fluoro Heterocyclics, Advanced Boric Acids/Esters, Heterocyclic Products, Protected Amino Acids, Reference Standards (API, impurities, and metabolites...),...

- **Pharma/Human Health Industry Focused**

- High-purity Omega-3 Products (EPA and DHA in EE form) for GMP Markets
- High-purity Omega-3 Products (EPA and DHA in EE form) for non-GMP Markets

- **Fluorination Technology and Applications**

- Broad Range of Custom Fluoro Products
- Specialty Fluorinating Reagents

- **Specialty Industry Focused**

- Catalyst Products (Imine Ligated NHC-Palladium Catalysts, Enzymes, and Ligands)
- Specialty Additives and Ingredients

Custom Chemistry_Process_Manufacturing Driven

Business Credentials



A Member of BHWTech Group

- ☐ **A Combined 65+ Years in Custom Chemistry Solution Businesses**
- ☐ **A Key Supplier to Commercial API Productions for Two Top-10 Big Pharma Customers**
- ☐ **Qualified for Three Phase III Drug Intermediates for Top-10 Big Pharma Customers**
- ☐ **Qualified for a Recently Launched New Drug for a Top-10 Big Pharma**
- ☐ **Seven Intermediates Qualified for Phase II Developmental Drugs**
- ☐ **Successfully Marketed Four Specialty Chemical Products**
- ☐ **High-purity EPA98EE in Phase II-III Developments under GMP**
- ☐ **Executed Successfully Challenging Chemistry Service Projects (FTE/FFS) for 100+ US Pharma and Biotech Clients**

About BHW Tech Group



A Member of BHWTech Group

- ❑ A USA-based JV Company Registered in Pennsylvania, USA
- ❑ GLSyntech in Controlling Shares in the JV Company
- ❑ Established in 2023 with a Global Technical Team of 260+ Chemists/Engineers in USA and China
- ❑ Primary Industry and Business Focuses
 - *Pharmaceutical and Biotech Industries*
 - *Human Health Industries*
 - *Specialty Chemical and Agro Chemical Industries*
- ❑ “1 + 1 > 2” Synergy and Expansion from Established Individual Businesses
- ❑ Global Customers, Global Operations, and Global Practice/Standard
- ❑ All Needed Enablers for “One-Stop” Chemistry Solutions from Lab to Commercial Scales

JV Synergy and Benefits



A Member of BHWTech Group

- ☐ Great Benefits to Customers from Joint Venture (“1 + 1 > 2”)
- ☐ Expanding Chemistry Services and Enhanced Product Portfolio into New Clients and New Projects
- ☐ Technical Synergies Broadening Existing Product Portfolio with New Custom Chemistries and Processes
- ☐ Stronger Chemistry and Process Expertise Serving New Drug Pipelines from Drug Discovery, Development, to Manufacturing
- ☐ Transforming New Custom Chemistries and Custom Processes into Custom Manufacturing Projects
- ☐ Addition of 2000+ New Custom Products to Product Portfolio
- ☐ More Resources for Internal Development of New Custom Products/Processes, esp. for Bulk Quantity and High-value Drug-like Pharmaceutical Products
- ☐ Extending Continuously Building Block Compound (BBC) Portfolio
- ☐ One-Stop Custom Chemistry Solution Platform Fulfilling Chemistry Challenges in New Drug Discovery, Development, and Manufacturing Processes

R&D Center in USA

GLSYNTECH
Dependable Chemistry™

A Member of BHWTech Group



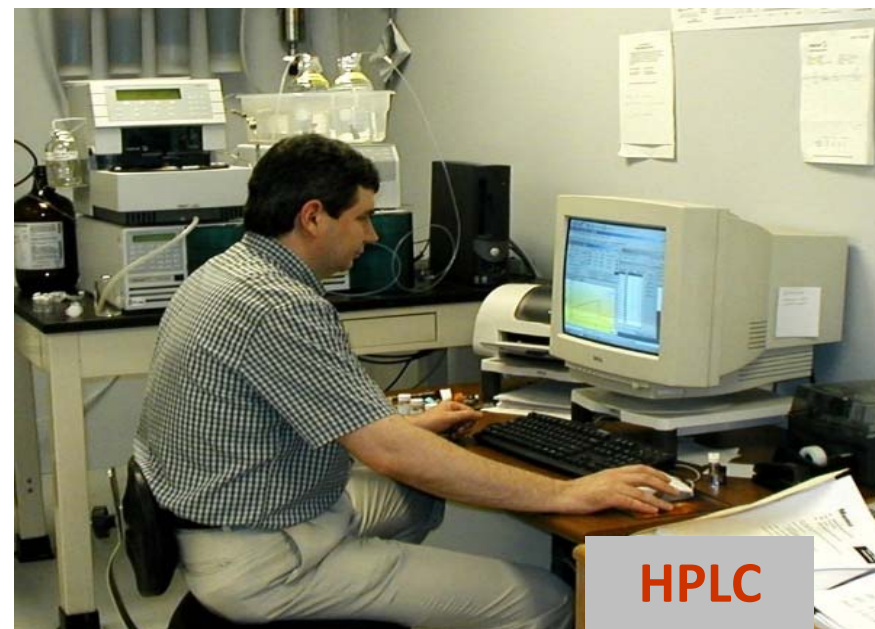
- Focus on New Chemistry Development and Technology Leadership
- Mainly Serving Pharma/Biotech Industries
- Kilo Production and Biological Services
- Process Development and Tech Transfer
- Located in Worcester, MA

Global QA

GL SYNTECH
Dependable Chemistry™

A Member of BHWTech Group

Advanced Instrumentation to Enable Quality



R&D Operations in China

GLSYNTECH
Dependable Chemistry™

A Member of BHWTech Group

Cost Performance and Scale of Economy



Logistics Center in China



A Member of BHWTech Group



天津安浩生物科技有限公司
Tianjin Anhao PharmaTech Co.,Ltd.
GL Syntech 中国分公司

- Location in Tianjin, China
- About 1300 FT² Lab Space, Expandable to 5000 FT²
- Primary Technical and Testing Lab
- Supply Chain and Supplier Management
- Administrative Operations in China



Logistic and Technical Operations in China

Production Plants

- Each Plant Focusing on Specific Chemistries and Processes
- Manufacturing of Pharmaceuticals and Specialty Chemicals
- Extra Production Capacity (~35%) Available for New Projects
- ISO Certified Production Sites
- All Plants Successfully Granted with ISO Certification
- cGMP Approach via Projects



Jinzhou, Liaoning

*Custom pharmaceuticals
Fluor Aromatic Products
Developmental Products*



Shanggao, Jiangxi

*Fluorinating Reagents
Fluor Aliphatics
Fluor intermediates*



Quzhou, Zhejiang

*Pharma Intermediates
Specialty Products
Developmental Products*

Production Plants

GLSYNTECH
Dependable Chemistry™

A Member of BHWTech Group



Manufacturing Capacity



A Member of BHWTech Group

Kilo Production/Pilot Plants/Commercial Plants

Equipment Capability

Total Reactor Capacity:	> 500,000 L
Number of Reactors:	226
7000 L, 2 sets	6000 L, 3 sets
5000 L, 6 sets	2000-3000 L, 20 sets
1000-1500 L, 30 sets	100-500 L, 33 sets
Temperature Control:	-78 to 300°C
Vacuum Capability:	up to 0.16 MPa
High Distillation and High-Pressure Capability	
Stainless Steel, Porcelain, Glass-lined	

QC/QA Capability

16 QC Chemists
NMR, GC, HPLC, LC-MS, Wet Chemistry and Analytical Lab
Advanced QA Instrumentation in US R&D Center
Material Approval and Release by QA

Chiral Technologies

Chemistry Technologies

> We are specialized in the following chem-transformation technologies

- Suzuki, Heck and Sonogashire Couplings
- Chiral Heterocyclic Transformations
- Protections of Amino Acids and their Derivatives (Fmoc-, Boc-)
- Liquid Phase Peptide Synthesis
- Freidel-Crafts Acylation and Alkylation
- Thiophosgenation and Phosgenation
- Fluorination, Bromination and Iodination
- Acetoacetylation and Acrylation
- Amidation and Amination
- Azidation, Carbonylation and Carboxylation
- Cyanomethylation and Cyclization
- Diketene and Ketene Reactions
- Epichlorohydrin Chemistry and Epoxidation
- Hydrazine Chemistry and Reactions
- Hydroformylation and Hydrosilylation
- Nitromethylation and Nitrosation
- Olefin Metathesis
- Optically Active Cyanohydrin
- Peroxidation and Silylations
- Sulfochlorination, Sulfonation and Sulfoxidation
- Thiocarbonylation and Tosylation
- Transamination and Transesterification

Biocatalyst Technologies

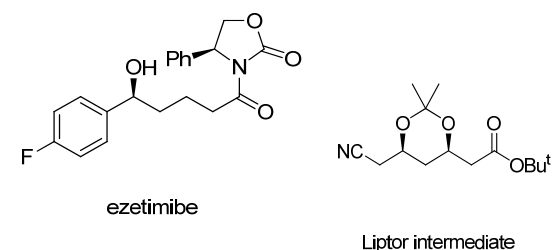
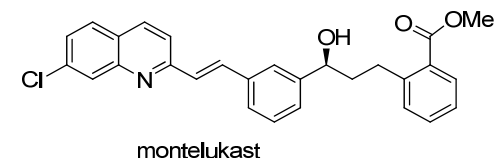
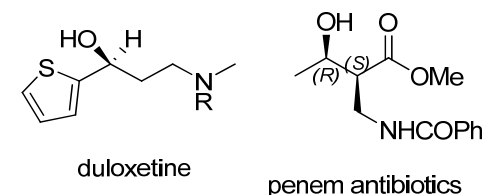
> Enzymatic Catalyst Products

- Ketoreductases
- Nitrilases
- Nitrile hydratases
- Ene reductases
- Oxynitrilases
- Transaminases
- Nitro reductases
- Alcohol oxidases
- P450s
- Amidases
- Epoxide hydrolases
- Lipases (immobilized)
- Proteases (immobilized)
- Esterases (immobilized)

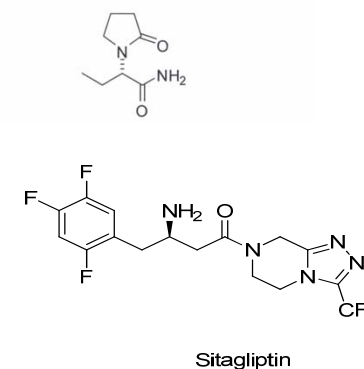
> Biocatalyst Services

- Biocatalyst libraries
- Lead screen Identification
- Process optimization
- Alternative process routes

> Alternative Processes Derived from Biocatalyst Transformation



Levetiracetam (Keppra®)



- **27+ Years of Good Chemistry Practice**
 - Medicinal Chemistry and Custom Synthesis
 - Process Development, and Contract R&D
 - Kilo Scale GMP Service
 - Custom Synthesis and Custom Manufacturing
- **Wide Range of Unique Custom Products**
 - Fluoroaromatic/Fluoroheterocyclic Custom Intermediate Products
 - Special Fluorinating Reagents
 - Protected Amino Acids and Oligonucleotides
 - Advanced Heterocyclic Compounds (N-, S- and O-based)
 - Advanced Boronic Acids and Esters
 - Lab Reference Compounds (APIs, metabolites, impurities,...)
 - Unique Scaffolds and Intermediates
- **High-purity Omega-3 Products**
 - High-pure GMP Products
 - Broad range of EPA, DHA, and their Combos Products for non-GMP Markets
- **Novel Imine Ligated NHC-Palladium Catalysts**
 - Highly efficient for cross-coupling of aryl chlorides and aryl boronic acids
 - Excellent catalyst stability with diverse ligand adjustments
 - Better catalytical economics with milder reaction conditions

Custom Chemistry Service (CCS)



A Member of BHWTech Group

- Custom Chemistry Service Offering Competent Chemistry Services (FTE/FFS and Process Development) through a Strategic Joint Venture
- Recognized 17+ Yrs of Experience/Expertise with 160+ Dedicated Chemists and 60,000 sq. ft. of State-of-the-Art Chemistry Facility
- Executed Successfully Challenging Projects for 100+ Global Clients
- Industrial Credentials (Reference available upon request)
- Mastery of Project Management, IP management, and Customer Relationship
- 2500+ New Compounds added to Product Portfolio, with 25% in stock
- Know-how Custom Chemistries and Chemical Processes driving Process Development and Scale-up
- GMP Like Services
- One-stop Custom Chemistry Solution Platform Satisfying all Chemistry Needs in New Drug Discovery, Development, and Manufacturing Processes

Success Track Record of Expertise and Experience

Profound CCS Offerings



A Member of BHWTech Group

- **Medicinal Chemistry Services**
 - Hit to lead discovery
 - Lead Optimization
- **Customer Synthesis (from discovery to preclinical)**
 - Library templates, building blocks, libraries, intermediates
 - Literature and commercial reference compounds, metabolites
 - Milligram to multi-kilogram quantities
- **SFC Chiral Separation Services**
 - Separation of enantiomers
 - From milligrams to multi-grams scale
- **Contract Research for Chemical Process R&D**
 - Route selections and reaction optimizations
 - Scale-up synthesis of non-GMP APIs
 - Manufacturing advanced intermediates and regulatory starting materials
 - Impurity profiling and synthesis of impurities as reference compounds
- **Analytical Services:** supporting chemistry, method development, impurity profiling, etc.

Drug Discovery → Preclinical Development → Process Development

Custom Fluoro Products



A Member of BHWTech Group

- 6500+ high-value fluoro-aromatic, fluoro-aliphatic and fluoro-heterocyclic products, along with other halogenated analogs
- 35% of Products in stock
- Production capacity in grams, kilos and tons
- Sustainable cost competitiveness & excellent quality
- Widely used in pharmaceuticals, agrochemicals and advanced materials

Fluoro Heterocyclics such as pyridines, pyrimidines, indoles, indazoles, pyrazines, ...

Fluoro Aliphatic Compounds such as 1-fluorocyclopropanecarboxylic acid and ethyl-2-fluoroacetoacetate

Fluoro Aromatic Compounds such as:

Acetophenones

Phenols & Anisoles

Benzamides

Benzoic acids/their esters

Benzonitriles

Benzyl alcohols & benzyl halides

Cinnamic aldehydes/Cinnamic acids

Hypnone (1-Phenyethanone)

Phenylisocyanates/phenyl isothiocyanates

Phthalic acids & anhydrides

Anilines

Benzaldehydes

Benzenes

Benzoyl chloride

Benzotrifluorides

Benzylamines

Hydroxybenzoates

Phenylacetonitriles/Phenylacetic acids

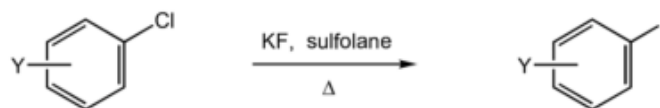
Phenylhydrazine series

Toluene series

Full Spectrum Fluoro Technologies and Products

Fluorinating Reagents

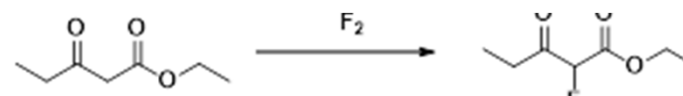
- Inorganic/ionic fluorides



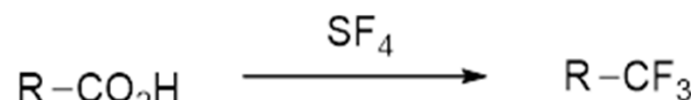
- SelectFluor® I and II



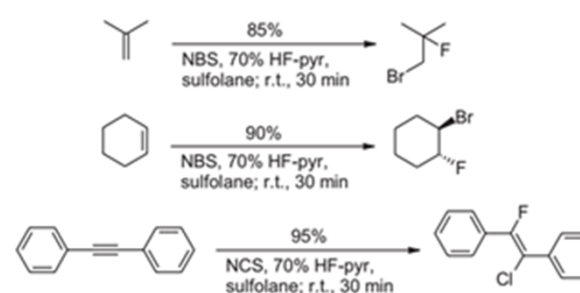
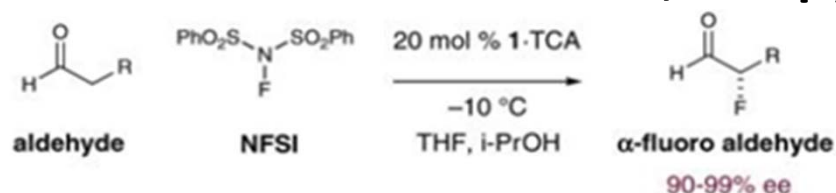
- Selective fluorination with fluorine gas (F_2)



- Trifluoromethylation with SF_4



- N-fluorobenzenesulfonimide, and pyridine HF/triethylamine tri-HF



Sustainable Process Economics, Excellent Quality and Stable Supply

High-purity Omega-3 Products



A Member of BHWTech Group

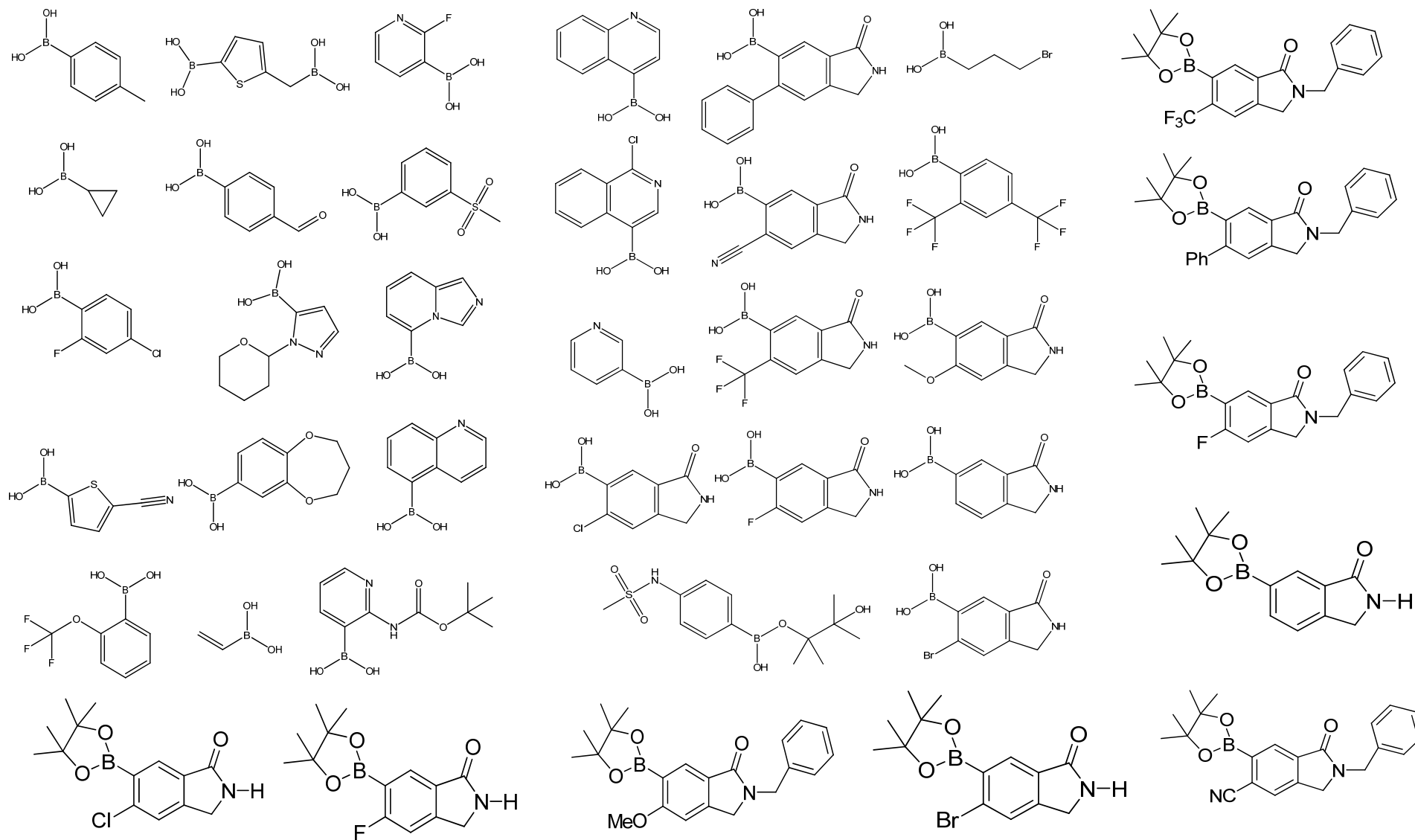
- **15 Years of Development with an Established GMP Manufacturing Facility Complying with cGMP, ISO9001, ISO14001, ISO 10012, and ISO22000**
- **Manufacturing Capacity 650+ MT/year of High-purity EPA and DHA Products**
- **Serving both GMP and non-GMP Markets**
- **Key Product Offerings**
 - A high purity Omega-3 EPA in ethyl ester (EE) form, EPA98EE, in its clinical Phase II/III development
 - Several high purity Omega-3 EPAs and DHAs in EE forms in early phase clinical developments
 - A broad range of EPA, DHA, and their combo products in EE form used in nutritional supplements, foods, and beverages markets
 - Omega-3 Acid Ethyl Ester 90 (offset to Lovaza®)
 - DHA-free, high purity Omega-3 EPA products in EE form with EPA concentration from 70% to 99% (include offsets to Vascepa® and Epadel®)
 - High purity Omega-3 DHA products in EE form with DHA concentration from 70% to 97%
 - EPA-free, high purity Omega-3 DHA API in EE form, DHA95EE
 - Mixed EPA and DHA in various ratios of total EPA+DHA from 70% to 95%
 - Various EPA and DHA grades in EE form such as EPA80EE, EPA90EE, EPA98EE, DHA80EE, DHA90EE and DHA95EE
 - Omega-3 EPA and DHA products, in the acid form, such as EPA90A, EPA95A, DHA90A and DHA95A
 - Custom Omega-3 EPAs, DHAs, and EPA/DHA combos

Strategic New Business Developments

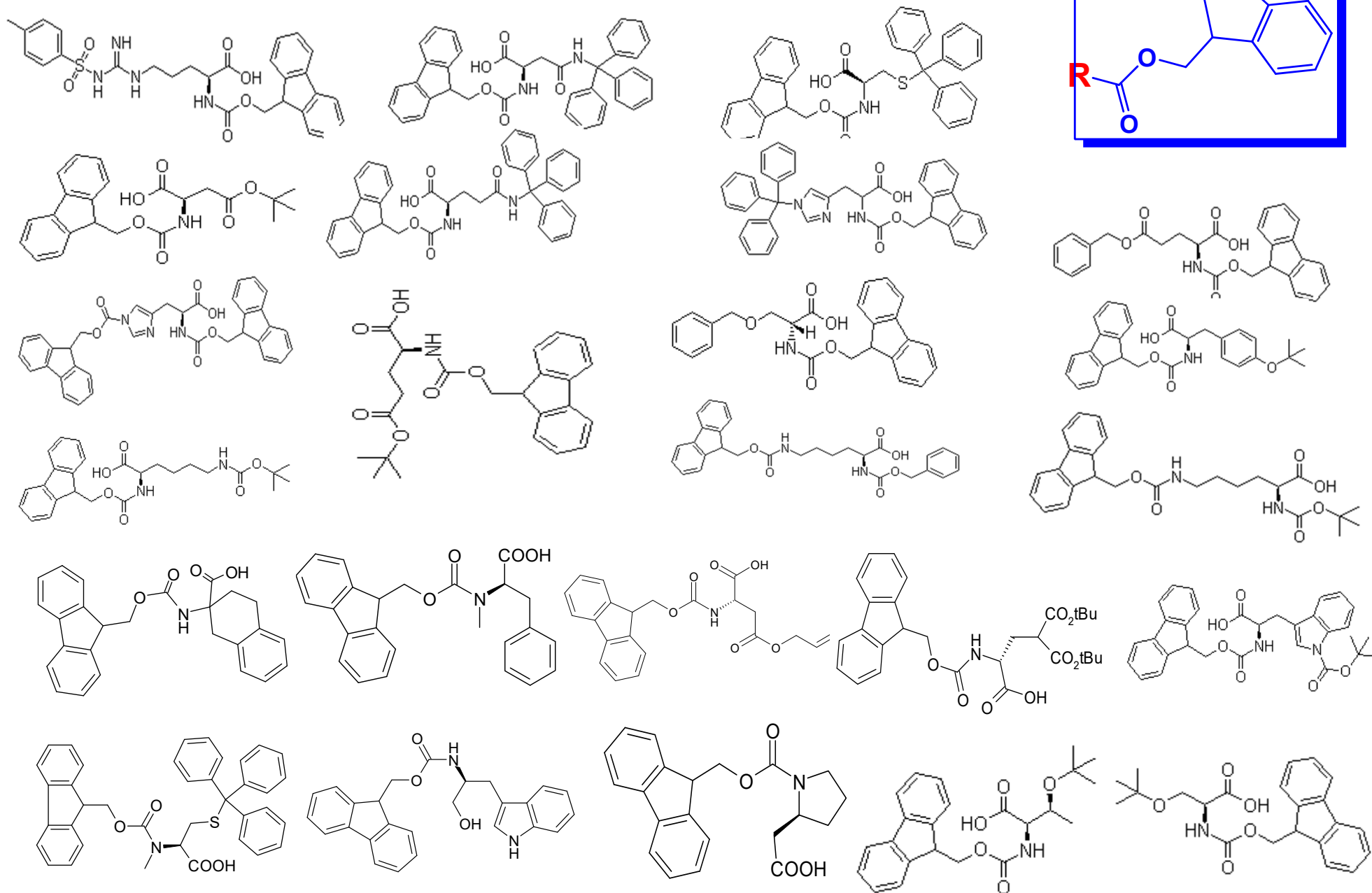
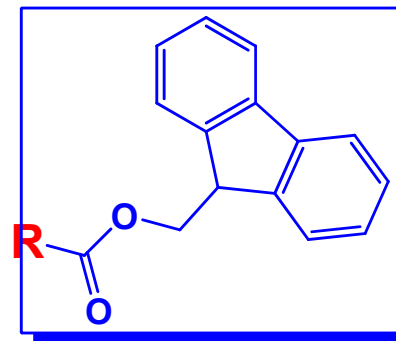
Specialty Boronic Acids/Esters

GLSYNTECH
Dependable Chemistry™

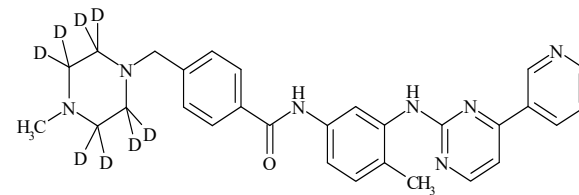
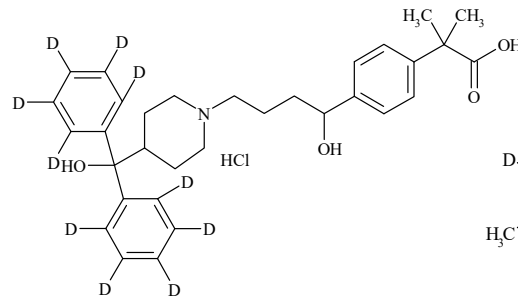
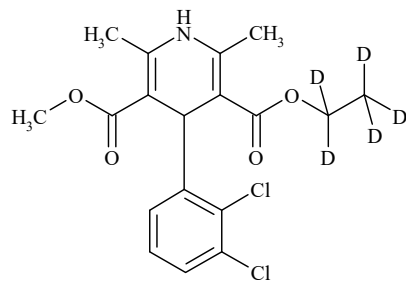
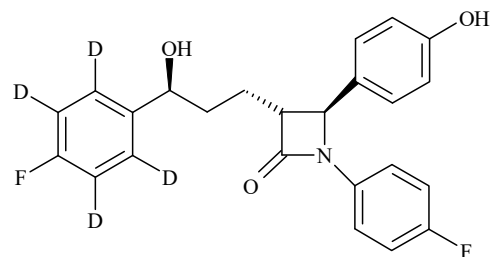
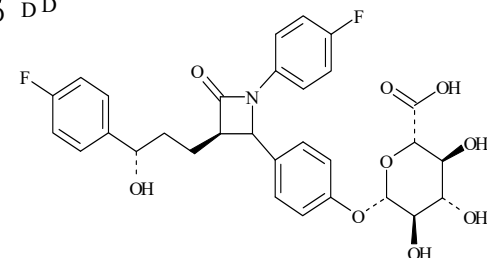
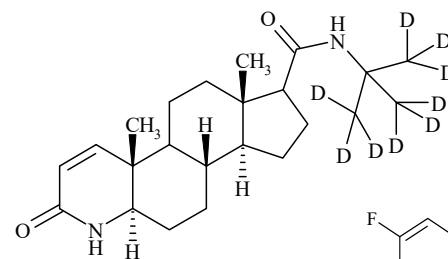
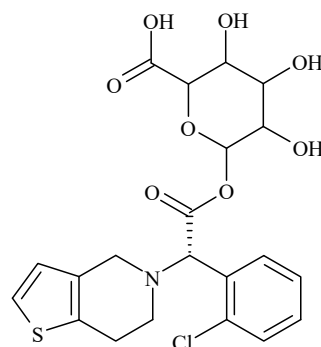
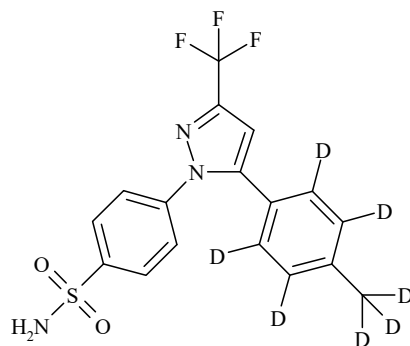
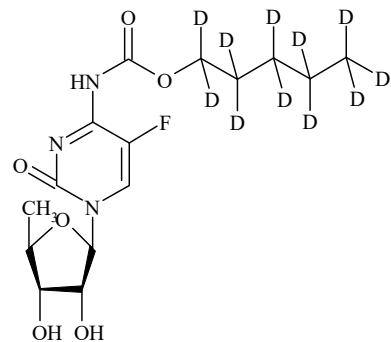
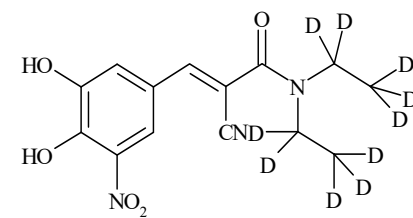
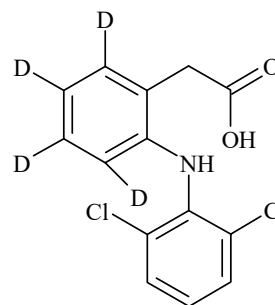
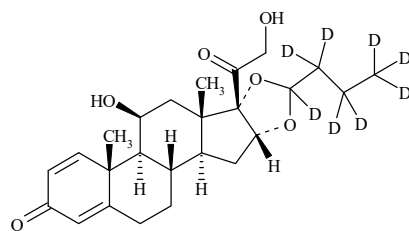
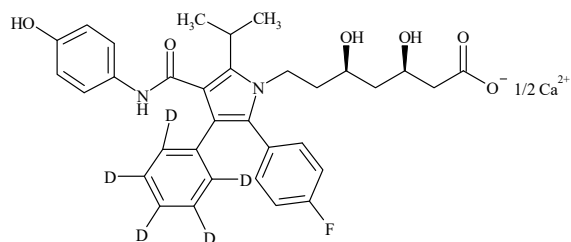
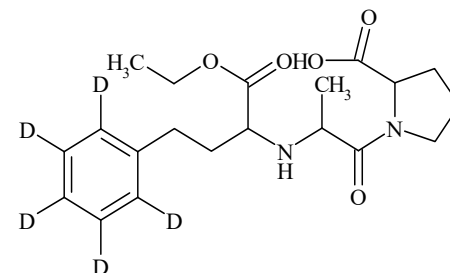
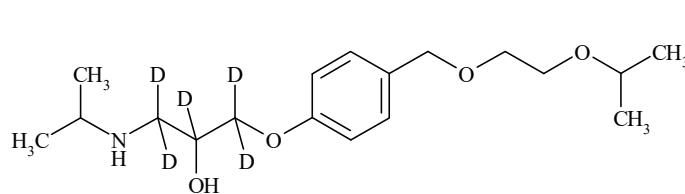
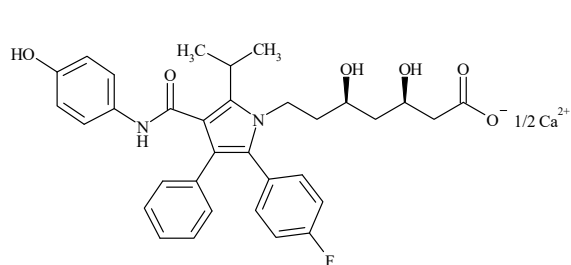
A Member of BHWTech Group



Fmoc-Protected Amino Acids



Lab Reference Compounds (APIs, Metabolites, impurities, ...)



Heterocyclic Compounds

- *Pyridines, naphthyridines, and pyrazines*
- *Azabicyclo compounds and diazaspiro compounds*
- *Cyclopropane, cyclobutane, and cycloheptane compounds*
- *Indoles, azaindoles, oxindoles, isoindoles*
- *Indazoles*
- *Quinolines, hydroquinolines, isoquinolines, and pyranopyridines*
- *Pyrrolidines*
- *Thiophenes*
- *Protected amino acids, and oligonucleotides*
- *Biaryl compounds*

Specialty Ingredients

DL Panthenol [USP]	DL-Panthenol Ethyl Ether [USP]
Kojic acid [USP]	Vitamin E acetate [USP]
Sodium dehydroacetate [USP]	Potassium sorbate [USP]
L-Cysteine [USP]	alpha-Lipoic Acid [USP]
L-Cystine [USP]	Mandelic acid [USP]
Coenzyme Q10 (CoQ 10)	Itaconic acid
ε-Polylysine	Glycine ethyl ester HCl

Specialty Additives

Rheology Modifiers/Thickeners (Non-ionic Associated & Alkali-swellable)
Poly(styrene-maleic anhydride) copolymer solutions (low M.W.)
Dispersants
Surfactants
Adhesion Promoters
UV Stabilizers/Antioxidants
Silanes and Silicone Crosslinkers
Diisocyanates

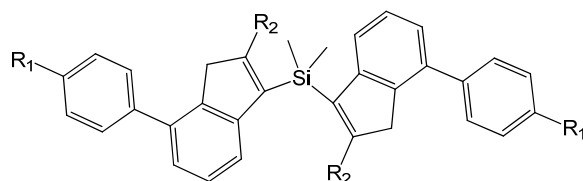
Green Building Blocks

LA, LAE and LAB:	Levulinic Acid, Ethyl & Butyl Ester Uses for making green solvents, plasticizers & starting materials
IA:	Itaconic Acid Uses for making acid functional copolymers and emulsions

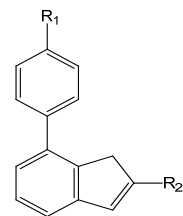
Catalyst Ligands

Ligands for Industry Catalysts

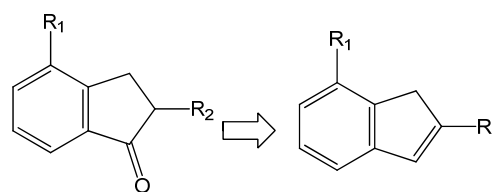
Indanone and Indene Series



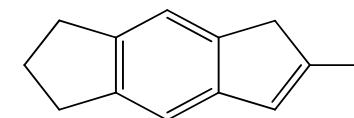
R1=H, Methyl, t-Butyl, etc.
R2=H, Methyl, ethyl, iso-propyl, etc.



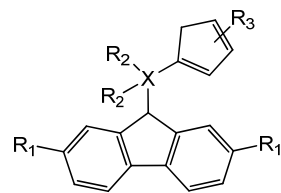
R1=H, Methyl, t-Butyl, etc.
R2=H, Methyl, iso-propyl, etc.



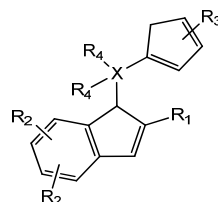
R1=H, Cl, Br
R2=H, Methyl, Ethyl, iso-propyl, n-propyl, n-butyl, etc.



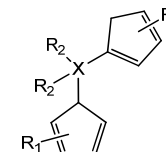
Bridged Cyclopentadienyl Compounds



X=C, Si
R1=H, t-Bu, etc.; R2=H, Me, Ph, etc.;
R3=H, n-Bu, n-Pr, t-Bu, etc.

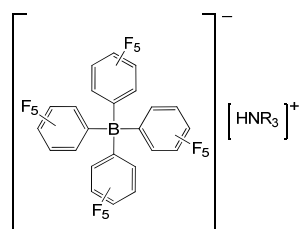


X= C, Si
R1=H, Me, n-Bu, etc.; R2=H, Me, Ph, etc.;
R3=H, n-Bu, n-Pr, t-Bu, etc., R4 = Me, Ph, etc.

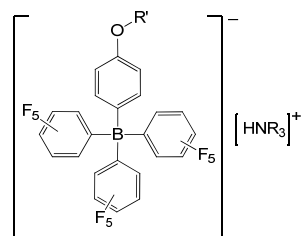


X= C, Si
R1=H, Me, n-Bu, etc.; R2=H, Me, Ph, etc.;
R3=H, n-Bu, n-Pr, t-Bu, etc.

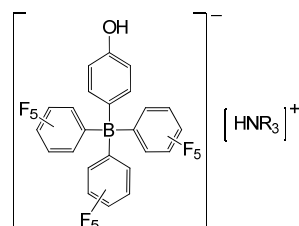
Perfluorinated Aryl Borate Compounds



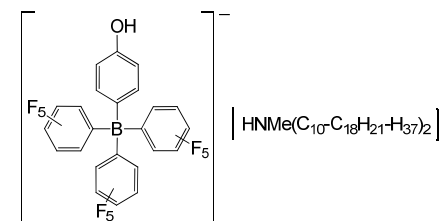
(a)



(b)

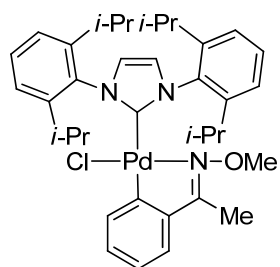


(c)



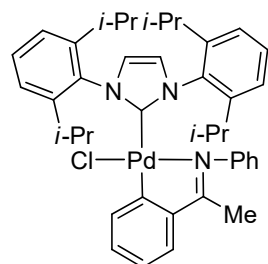
(d)

Imine Ligated NHC-Pd Catalysts



N-Methoxy-benzenemethanimine-chloro-[1,3-bis(mesityl)-imidazole-2-ylidene]palladium(II)

- 15.5% to 16.0% Palladium
- Ultra-low catalyst load as low as 0.005 mol%



N-Phenyl-benzenemethanimine-chloro-[1,3-bis(mesityl)-imidazole-2-ylidene]palladium(II)

- 14.3% to 14.8% Palladium
- Ultra-low catalyst load as low as 0.001 mol%

$$\text{ArCl (7)} + \text{ArB(OH)}_2 \xrightarrow[\text{PrOH/H}_2\text{O, 80 } ^\circ\text{C}]{\text{Cat 6 (0.005 mol\%), KOH (1.5 equiv)}} \text{Ar-Ar' (9)}$$

Entry ^a	Aryl chlorides	Boronic acids	Product	Yield ^b (%)	
				6a	6c
1			9a	87 (85)	85
2			9b	>99 (92)	>99
3			9c	92 (86)	94
4			9d	96 (92)	94
5			9e	88 (84)	87
6			9f	93 (89)	97
7			9g	93 (86)	99
8			9h	>99 (96)	>99
9			9i	95 (91)	98
10			9j	95 (88)	95
11			9k	96 (90)	99
12			9l	>99 (91)	>99
13			9m	99 (97)	>99
14			9n	91 (86)	97
15			9o	>99 (93)	96
16			9p	90 (84)	99
17			9q	93 (85)	96

$$\text{ArCl (7)} + \text{ArB(OH)}_2 \xrightarrow[\text{PrOH/H}_2\text{O, 80 } ^\circ\text{C}]{\text{Cat 6 (0.005 mol\%), KOH (1.5 equiv)}} \text{Ar-Ar' (9)}$$

Entry ^a	Aryl chlorides	Boronic acids	Product	Yield ^b (%)		
				6a	6c	6d
1			9b	82	98	88
2			9k	88	97	81
3			9l	37	99	98
4			9d	56	92	39
5			9o	69	92	45
6			9n	73	90	80
7			9p	75	91	88
8			9h	93	98	96
9			9j	87	92	94
10			9m	93	96	96

^a Reaction condition: catalyst **6** (0.005 mol%), ArCl **7** (3.0 mmol), ArB(OH)₂ **8** (3.15 mmol, 1.05 equiv), KOH (4.5 mmol, 1.5 equiv), ^bPrOH/H₂O = 10:1 (5 mL). Reactions were completed in 2 h.

^b GC yield based on ArCl **7**.

Summary

- Chemistry and Technology-Driving, and well-balanced business portfolio serving pharma/biotech and specialty chemical markets
- A Privately held, USA-based custom chemistry developer and manufacturer with 27+ years of proven track record
- Unique expertise in multi-step challenging chemistry, process scale-up, custom manufacturing, and application development, coped with competent manufacturing capability
- R&D in USA focusing on new developments in technology, process, and applications, enabling business successes while streamlining lean manufacturing in China
- One-stop custom chemistry solution platform serving drug discovery/development/manufacturing processes

We Appreciate Your Attention!