Synthesis Alerts is a monthly feature to help readers of Synthesis keep abreast of new reagents, catalysts, ligands, chiral auxiliaries, and protecting groups which have appeared in the recent literature. Emphasis is placed on new developments but established reagents, catalysts etc are also covered if they are used in novel and useful reactions. In each abstract, a specific example of a transformation is given in a concise format designed to aid visual retrieval of information.

Synthesis Alerts is a personal selection by:

Elyse Bourque, Robert Chow, Jennifer Delaney, Marcel de Puit and Sukhjinder Uppal of Department of Chemistry, Leeds University, Leeds LS2 9JT, UK.

The journals regularly covered by the abstractors are:

Angewandte Chemie International Edition
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Chemical Communications
Chemistry A European Journal
Chemistry Letters
Collection Czechoslovak Chemical Communications
European Journal of Organic Chemistry
Helvetica Chimica Acta
Heterocycles
Journal of the American Chemical Society
Journal of Organic Chemistry
Organic Letters
Organometallics
Perkin Transactions I
Synlett
Synthesis
Tetrahedron
Tetrahedron Asymmetry and Tetrahedron Letters

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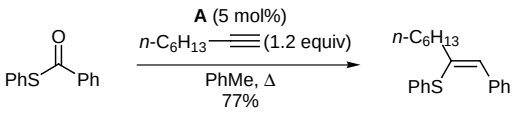
Tetrakis(triphenylphosphine)platinum(0) ***Catalyst***

The title reagent catalyses the carbolithiation of alkynes.

$Pt(PPh_3)_4$

A

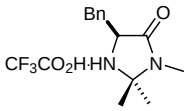


16 examples (yields 0,33–85%).

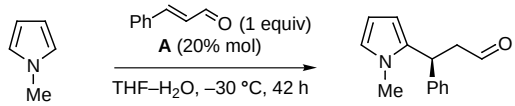
Sugoh, K.; Kuniyasu, H.; Sugae, T.; Ohtaka, A.; Takai, Y.; Tanaka, A.; Machino, C.; Kambe, N.; Kurosawa, H. *J. Am. Chem. Soc.* **2001**, *123*, 5108.

Imidazolidinone ***Catalyst***

The title reagent promotes the asymmetric Friedel–Crafts alkylation of pyrroles with α,β-unsaturated aldehydes.



A



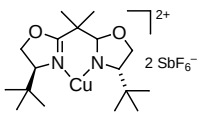
87%
er = 97:3

7 examples (yields 72–90%, %ee 87–93%).

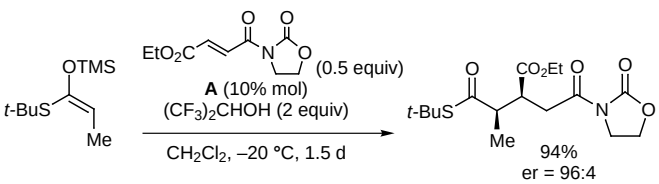
Paras, N. A.; MacMillan, D. W. C. *J. Am. Chem. Soc.* **2001**, *123*, 4370.

Bis(oxazoline) Copper(II) Complex ***Catalyst***

The title reagent promotes enantioselective and diastereoselective Michael additions of enolsilanes to unsaturated imide derivatives.



A



94%
er = 96:4
dr = 93:7

33 examples (yields 40–99%, %ee 40–99%, %de 46–98%).

Evans, D. A.; Scheidt, K. A.; Johnston, J. N.; Willis, M. C. *J. Am. Chem. Soc.* **2001**, *123*, 4480.

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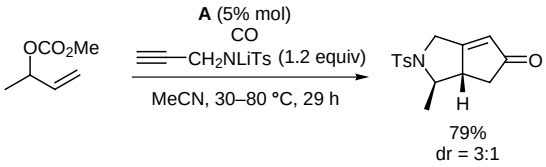
Rhodium(I) Complex ***Catalyst***

The title reagent promotes regio- and diastereoselective tandem allylic alkylation/Pauson–Khand annulation reactions.

Evans, P. A.; Robinson, J. E. *J. Am. Chem. Soc.* **2001**, *123*, 4609.

$[RhCl(CO)dppp]_2$

A



9 examples (yields 63–84%, %de 50–90%).

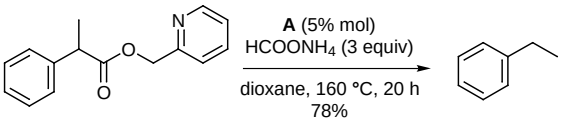
Triruthenium Dodecacarbonyl ***Catalyst***

The title reagent promotes reductive decarboxylation of esters involving the cleavage of acyl-oxygen bonds of esters.

Chatani, N.; Tatamidani, H.; Ie, Y.; Kakiuchi, F.; Murai, S. *J. Am. Chem. Soc.* **2001**, *123*, 4849.

$Ru_3(CO)_{12}$

A



18 examples (yields 0–100%).

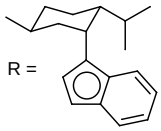
Chiral Zirconocene ***Catalyst***

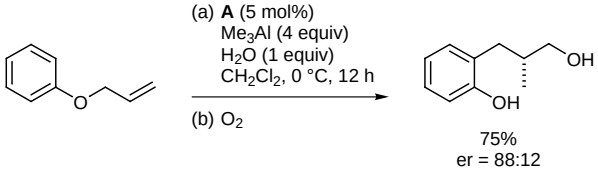
The title reagent, in the presence of water, promotes the asymmetric carboalumination of terminal alkenes, following the trimethylaluminium-mediated aromatic Claisen reaction in a tandem process.

Wipf, P.; Ribe, S. *Org. Lett.* **2001**, *3*, 1503.

$ZrCl_2R_2$

A



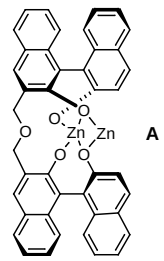


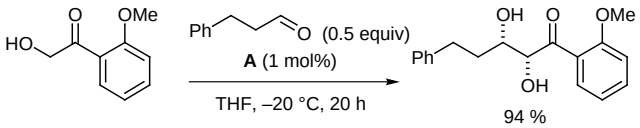
9 examples (yields 39–78%, %ee 60–80%).

Zn-Zn-Linked BINOL Complex ***Catalyst***

The title reagent promotes asymmetric aldol reactions to afford α,β-dihydroxy ketones.

Kumagai, N.; Matsunaga, S.; Yoshikawa, N.; Ohshima, T.; Shibasaki, M. *Org. Lett.* **2001**, *3*, 1539.





13 examples (yields 73–95%, %ee 77–99%, %de 20–94%).

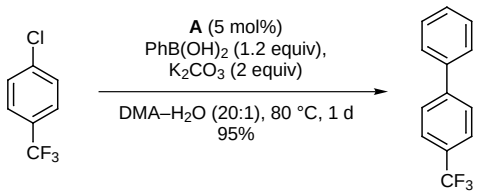
Palladium/Carbon ***Catalyst***

The title reagent catalyses the Suzuki cross-coupling reaction of phenylboronic acid with aryl chlorides.

LeBlond, C. R.; Andrews, A. T.; Sun, Y.; Sowa, J. R. Jr. *Org. Lett.* **2001**, *3*, 1555.

Pd/C

A



7 examples (yields 32–95%).

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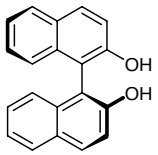
(*S*)-BINOL/Titanium Dichlorodiisopropoxide ***Catalyst***

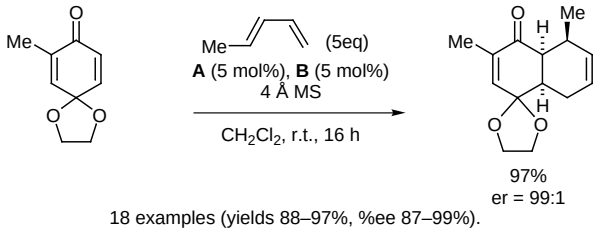
The title reagent pair catalyses the enantioselective Diels–Alder reaction of achiral 1,4-quinone monoketals with various dienes.



A

$Cl_2Ti(O\textit{i}\text{-}Pr)_4$

B



97%
er = 99:1

18 examples (yields 88–97%, %ee 87–99%).

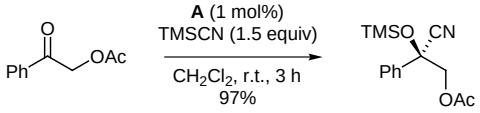
Breuning, M.; Corey, E. J. *Org. Lett.* **2001**, *3*, 1559.

Indium Tribromide ***Catalyst***

The title reagent catalyses the addition of trimethylsilyl cyanide to α-hetero-substituted ketones.

$InBr_3$

A

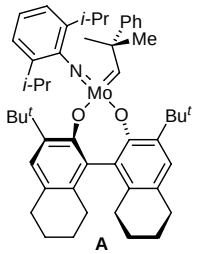


10 examples (yields 27–99%).

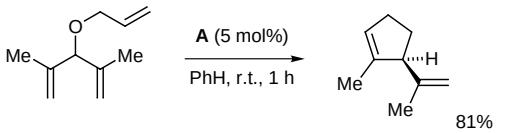
Bandini, M.; Cozzi, P. G.; Melchiorre, P.; Umani-Ronchi, A. *Tetrahedron Lett.* **2001**, *42*, 3041.

Molybdenum-based Chiral Catalyst ***Catalyst***

The title reagent catalyses enantioselective olefin metathesis.



A



81%
er = 96:4

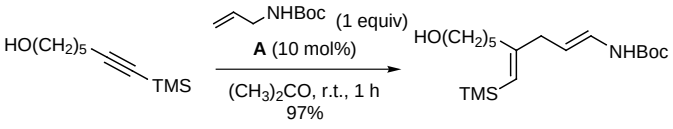
7 examples (yields 54–86%, %ee 92–98%).

Aeilts, S. L.; Cefalo, D. R.; Bonitatebus, P. J.; Houser, J. H.; Hoveyda, A. H.; Schrock, R. R. *Angew. Chem. Int. Ed.* **2001**, *40*, 1452.

Ruthenium Complex ***Catalyst***

The title reagent catalyses the 3-carbon chain extension of alkynes to give enamides.

A

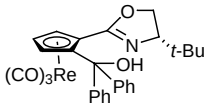


20 examples (yields 50–97%).

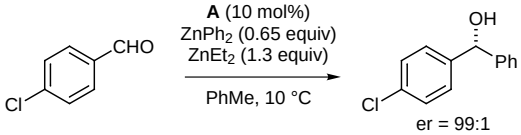
Trost, B. M.; Surivet, J.-P. *Angew. Chem. Int. Ed.* **2001**, *40*, 1468.

Planar Chiral η^5-Cyclopentadienylrhenium(I)tricarbonyl Complex ***Catalyst***

The title reagent catalyses enantioselective phenyl transfer to aldehydes.



A



er = 99:1

9 examples (%ee 78–99%).

Bolm, C.; Kesselgruber, M.; Hermanns, N.; Hildebrand, J. P.; Raabe, G. *Angew. Chem. Int. Ed.* **2001**, *40*, 1488.

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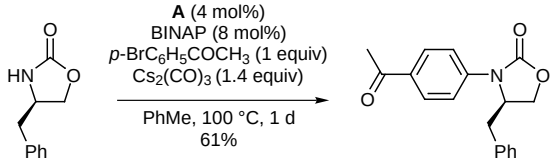
Tris(dibenzylideneacetone)dipalladium(0) ***Catalyst***

The title reagent catalyses the intermolecular coupling of aryl bromides and oxazolidinones.

Madar, D. J.; Kopecka, H.; Pireh, D.; Pease, J.; Pliushchev, M.; Sciotti, R. J.; Wiedeman, P. E.; Djuric, S. W. *Tetrahedron Lett.* **2001**, *42*, 3681.

$Pd_2(dba)_3$

A

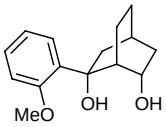


9 examples (yields 15–77%).

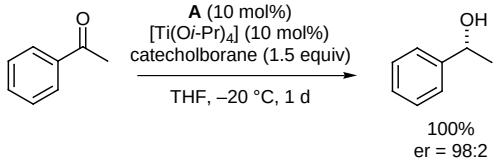
2-(2-Anisyl)-bicyclo[2.2.2]octane-2,6-diol (BODOL) ***Ligand***

The title ligand is employed in the titanium-catalysed asymmetric reduction of ketones with catecholborane.

Sarvary, I.; Almqvist, F.; Frejd, T. *Chem.–Eur. J.* **2001**, *7*, 2158.



A

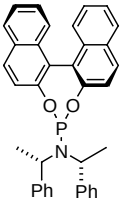


15 examples (yields 50–100%, %ee 48–98%).

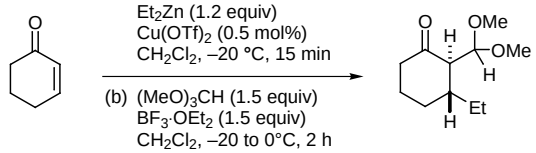
Phosphoramidate ***Ligand***

The title reagent promotes the formation of homochiral zinc enolates in a tandem enantioselective conjugate addition.

Alexakis, A.; Trevitt, G. P.; Bernardinelli, G. *J. Am. Chem. Soc.* **2001**, *123*, 4358.



A

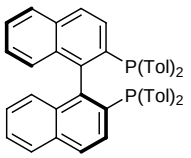


6 examples (yields 54–66%).

2,2'-Bis(di-*p*-tolylphosphino)-1,1'-binaphthyl [(*S*)-*p*-tol-BINAP] ***Ligand***

The title ligand is employed in the copper-catalysed asymmetric conjugate reduction of β-substituted enones for the synthesis of enantiomerically enriched 2,3-disubstituted cylcopentenones.

Yun, J.; Buchwald, S. L. *Org. Lett.* **2001**, *3*, 1129.



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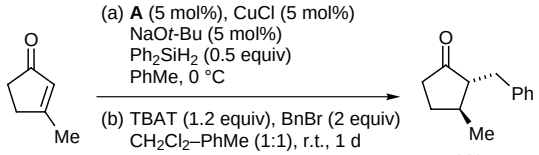
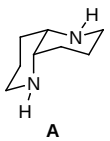


8 examples (yields 42–67%, %de 80–94%).

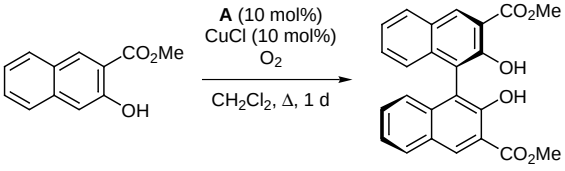
1,5-Diazadecalin ***Ligand***

The title ligand is employed in the copper-catalysed enantioselective oxidative biaryl coupling of substituted 2-naphthol derivatives.

Li, X.; Yang, J.; Kozlowski, M. C. *Org. Lett.* **2001**, *3*, 1137.



A



6 examples (yields 32–89%, %ee 13–90%).

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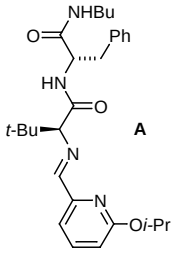
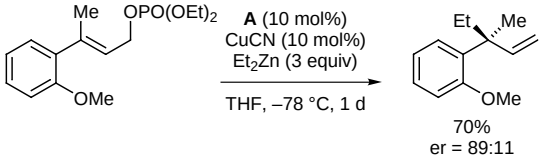
Modular Pyridinyl Peptide Ligand — *Ligand*

The title ligand is applied in the copper-catalysed asymmetric allylic substitution of di- and trisubstituted alkenes.



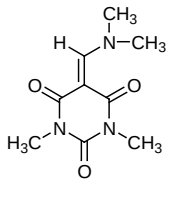


6 examples (yields 34–96%, %ee 66–82%).

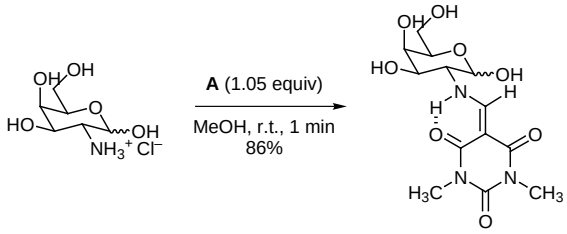
Luchaco-Cullis, C. A.; Mizutani, H.; Murphy, K. E.; Hoveyda, A. H. *Angew. Chem. Int. Ed.* **2001**, *40*, 1456.

1,3-Dimethyl-5-[(dimethylamino)methylene]-2,4,6-(1*H*,3*H*,5*H*)-trioxopyrimidine — *Reagent*

The title reagent is used to protect aminosugars and other primary amides.



A

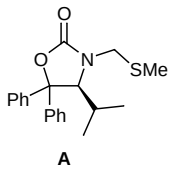


2 examples (yields 86–90%).

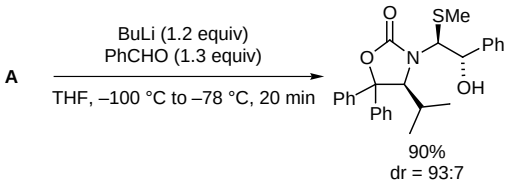
Dekany, G.; Bornaghi, L.; Papageorgiou, J.; Taylor, S. *Tetrahedron Lett.* **2001**, *42*, 3129.

4-Isopropyl-3-(methylthiomethyl)-5,5-diphenyloxazolidin-2-one — *Reagent*

The lithiated derivative of A is used as a chiral formyl anion equivalent for the preparations of 1,2-diols, 2-amino alcohols, 2-hydroxy esters, and 4-hydroxy-2-alkenoates.



A



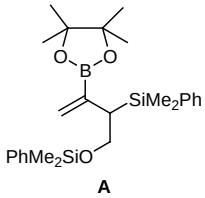
90%
dr = 93:7

30 examples (yields 25–92%, %de 24–94%).

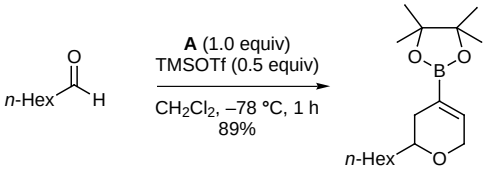
Gaul, C.; Schärer, K.; Seebach, D. *J. Org. Chem.* **2001**, *66*, 3059.

β-Borylallylsilane — *Reagent*

The title reagent is used for the synthesis of cyclic alkenylboranes through an acetalisation-cyclisation sequence with aldehydes.



A



9 examples (yields 34–94%).

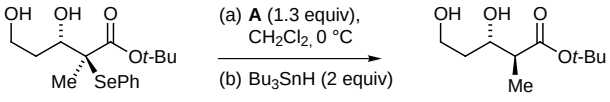
Suginome, M.; Ohmori, Y.; Ito, Y. *J. Am. Chem. Soc.* **2001**, *123*, 4601.

Triethylboron — *Reagent*

The title reagent plays a dual role as radical initiator and in situ derivitisation reagent in hydrogen transfer reactions involving acyclic 1,2- and 1,3-diols.

Et_3B

A



90%
dr = 20:1

4 examples (yields 78–90%, %de 20–91%).

Bouvier, J.-P.; Jung, G.; Liu, Z.; Gurérin, B.; Guindon, Y. *Org. Lett.* **2001**, *3*, 1391.

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Phenylsilane/Dibutyltin Chloride ***Reagent***

The title reagent pair promotes the direct reductive amination of aldehydes and ketones.

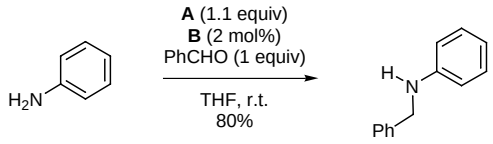
Apodaca, R.; Xiao, W. *Org. Lett.* **2001**, *3*, 1745.

$PhSiH_3$

A

Bu_2SnCl_2

B

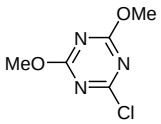


20 examples (yields 13–91%).

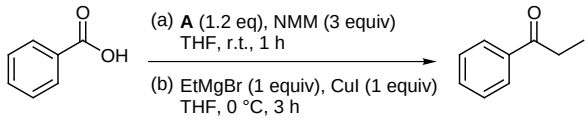
2-Chloro-4,6-dimethoxy[1,3,5]triazine ***Reagent***

The title reagent converts carboxylic acids into activated esters under mild conditions, which are subsequently reacted with a Grignard/CuI reagent to give the corresponding ketones.

De Luca, L.; Giacomelli, G.; Porcheddu, A. *Org. Lett.* **2001**, *3*, 1519.



A



10 examples (yields 48, 90–98%) are reported.

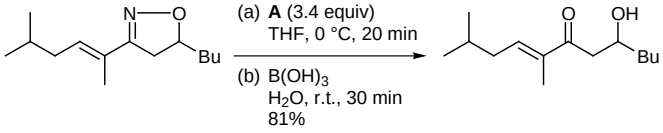
Samarium Iodide ***Reagent***

The title reagent is used as a reducing agent in the selective reduction of conjugated Δ^2-isoxazolines, which after hydrolysis with $B(OH)_3$, gives the corresponding unsaturated β-hydroxy ketones.

Bode, J. W.; Carreira, E. M. *Org. Lett.* **2001**, *3*, 1587.

SmI_2

A



10 examples (yields 56–90%).

Polymethylhydrosiloxane (PMHS)-Zinc Chloride/Tetrakis(triphenylphosphine)palladium(0) ***Reagent***

The title reagent pair is used for the selective cleavage of allyl ethers, amines and esters.

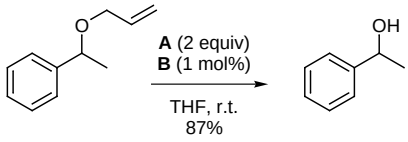
Chandrasekhar, S.; Raji, ReddyC.; Jagadeeshwar Rao, RaoR. *Tetrahedron* **2001**, *57*, 3435.

PMHS-$ZnCl_2$

A

$Pd(PPh_3)_4$

B

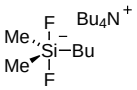


26 examples (yields 85–94%).

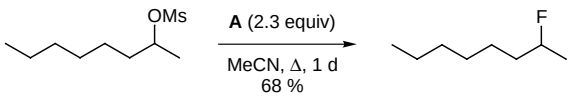
Tetrabutylammonium Butyldifluorodimethylsilicate ***Reagent***

The title reagent is used as a nucleophilic fluorinating agent.

Kvícala, J.; Mysík, P.; Paleta, O. *Synlett* **2001**, 545.



A



11 examples (yields 10–81%).

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