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, Department of Chemistry, Leeds University, Leeds, LS2 9JT, UK.

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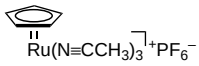
The journals regularly covered by the abstractors are:

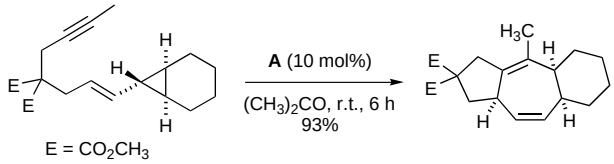
Angewandte Chemie International Edition
Bulletin of the Chemical Society of Japan
Chemical Communications
Chemistry A European Journal
Chemistry Letters
Collection Czechoslovak Chemical Communications
European Journal of Organic Chemistry
Helvetica Chimica Acta
Heterocycles
Journal of the American Chemical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

Ruthenium(II) Complex ***Catalyst***

Reagent A catalyses the intramolecular [5+2] cycloaddition of cyclopropyl enynes.



A



11 examples (yields 69–93%).

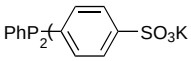
Trost, B. M.; Shen, H. C. *Angew. Chem. Int. Ed.* **2001**, *40*, 2313.

Rhodium Cyclooctadienylchloride Dimer/Bis(p-sulfonatophenyl)phenylphosphine Dipotassium Salt (TPPDS) ***Catalyst***

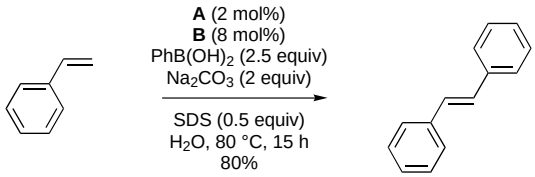
The title reagent pair catalyse coupling reactions of arylboronic acids to olefins in aqueous media.

$[Rh(COD)Cl]_2$

A



B

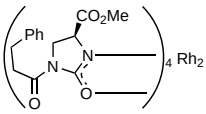


17 examples (yields 20–88%).

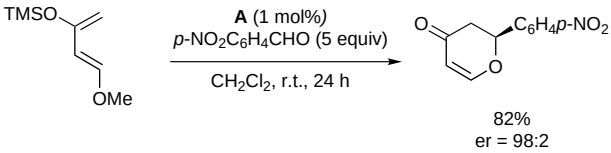
Lautens, M.; Roy, A.; Fukuoka, K.; Fagnou, K.; Martin-Matute, B. *J. Am. Chem. Soc.* **2001**, *123*, 5358.

Dirhodium(II) Carboxamidate ***Catalyst***

The title reagent promotes enantioselective Hetero-Diels–Alder reactions.



A



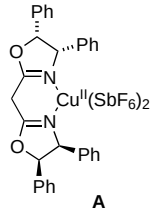
3 examples (yields 41–82%, %ee 81–95%).

Doyle, M. P.; Phillips, I. M.; Hu, W. *J. Am. Chem. Soc.* **2001**, *123*, 5366.

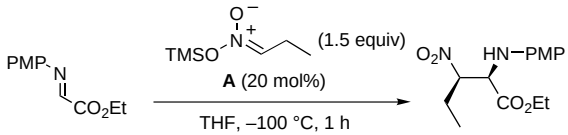
Chiral Bisoxazoline ***Catalyst***

The title reagent catalyses the enantio- and diastereoselective aza-Henry reaction between silyl nitronates and α-amino esters to generate β-nitro-α-amino esters.

Knudsen, K. R.; Risgaard, T.; Nishiwaki, N.; Gothelf, K. V.; Jorgensen, K. A. *J. Am. Chem. Soc.* **2001**, *123*, 5843.



A



94%
er = 98:2
dr = 25:1

2 examples (yields 87–94%, %ee 83–95%).

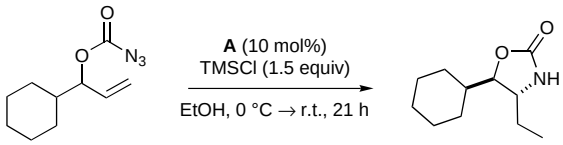
Iron (II) Chloride ***Catalyst***

The title reagent catalyses intramolecular nitrogen transfer in alkenyloxycarbonyl azides to give the corresponding oxazolidinones.

Bach, T.; Schlummer, B.; Harms, K. *Chem.–Eur. J.* **2001**, *7*, 2581.

$FeCl_2$

A



72%
dr = 91:9

11 examples (yields 33–82%. %de 2–99%).

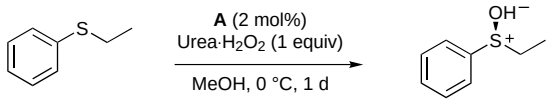
(*R*,*R*)-Di-m-oxo Ti(salen) ***Catalyst***

The title reagent, in the presence of urea·H_2O_2, catalyses the asymmetric oxidation of sulfides to sulfoxides in good yields and with high enantioselectivities.

Saito, B.; Katsuki, T. *Tetrahedron Lett.* **2001**, *42*, 3873.

(*R*,*R*)-Di-μ-oxo Ti(salen)

A



91%
er = 97:3

7 examples (yields 72–93%, %ee 92–99%).

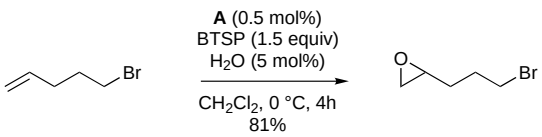
Rhenium Trioxide ***Catalyst***

The title reagent catalyses olefin epoxidation by bis(trimethylsilyl) peroxide (BTSP).

Yudin, A. K.; Chiang, J. P.; Adolfsson, H.; Copéret, C. *J. Org. Chem.* **2001**, *66*, 4713.

ReO_3

A

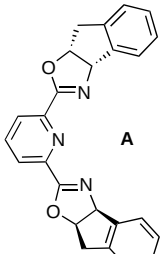


8 examples (yields 70–96%).

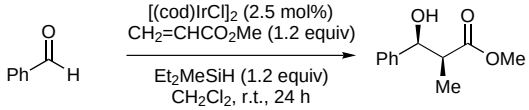
Iridium-Pybox Catalyst ***Catalyst***

The title reagent converts trialkylsilanes, methyl acrylate and certain aldehydes to the corresponding reduced aldol products with good enantio- and diastereocontrol.

Zhao, C.-X.; Duffey, M. O.; Taylor, S. J.; Morken, J. P. *Org. Lett.* **2001**, *3*, 1829.



A

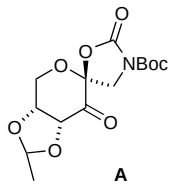


68%
er = 97:3
dr = 7:1

10 examples (yields 0–68%, %ee 76–96%, %de 66–90%).

Chiral Ketone ***Catalyst***

The title reagent catalyses the enantioselective epoxidation of terminal olefins using oxone.



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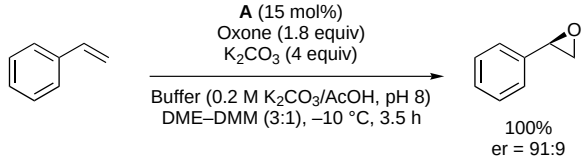
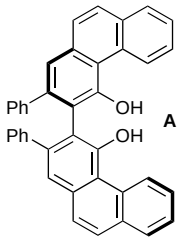


10 examples (yields 61–100%, %ee 71–85%).

Tian, H.; She, X.; Xu, J.; Shi, Y. *Org. Lett.* **2001**, *3*, 1929.

(*S*)-VAPOL ***Ligand***

The title ligand is applied in the asymmetric zirconium-catalysed imino aldol reaction.



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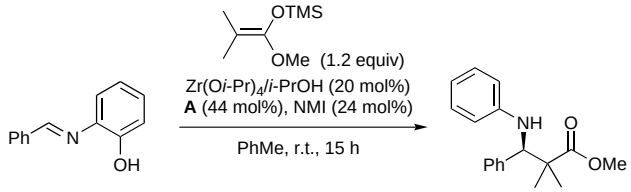
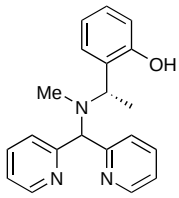


7 examples (yields 78–100%, %ee 36–99%).

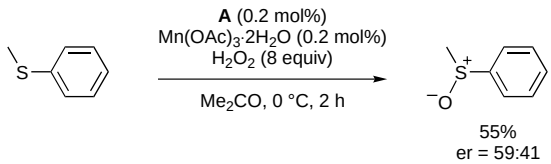
Xue, S.; Yu, S.; Deng, Y.; Wulff, W. D. *Angew. Chem. Int. Ed.* **2001**, *40*, 2271.

(*S*)-(Di-pyridin-2-ylmethyl)-methyl-(1-phenylethyl)-amine ***Ligand***

The title ligand, when complexed with manganese, catalyses the oxidation of sulfides to sulfoxides using hydrogen peroxide.



A

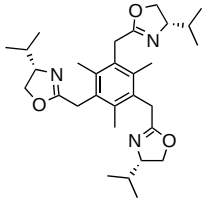


6 examples (yields 48–55%, %ee 5–18%).

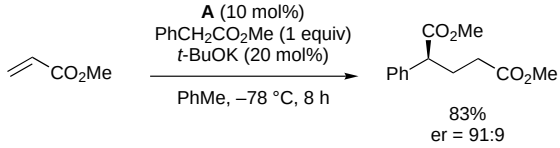
Brinksma, J.; La Crois, R.; Feringa, B. L.; Donnoli, M. I.; Rosini, C. *Tetrahedron Lett.* **2001**, *42*, 4049.

Benzene-based tripodal oxazoline ***Ligand***

The title reagent can be used as a ligand in the enantioselective catalytic Michael addition of methyl phenylacetate to methyl acrylate.



A



1 example (yield 83%, %ee 82%).

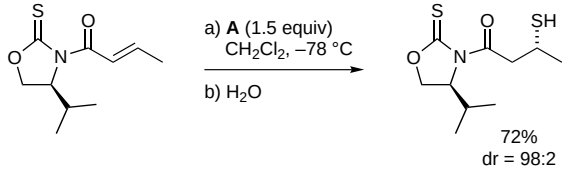
Kim, S.-G.; Ahn, K. H. *Tetrahedron Lett.* **2001**, *42*, 4175.

Tin(IV) Chloride ***Reagent***

The title reagent promotes asymmetric synthesis of β-mercapto carboxylic acid derivatives by intramolecular sulfur transfer in *N*-enoyl oxazolidine-2-thiones.

$SnCl_4$

A

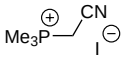


15 examples (yields 56–98%, %de 30–96%).

Palomo, C.; Oiarbide, M.; Dias, F.; Ortiz, A.; Linden, A. *J. Am. Chem. Soc.* **2001**, *123*, 5602.

(Cyanomethyl)trimethylphosphonium Iodide ***Reagent***

The title reagent promotes the formation of thioethers from thiols and aliphatic alcohols.



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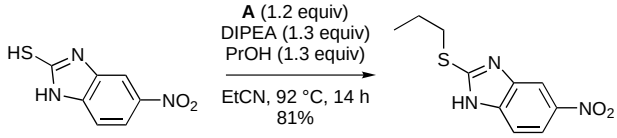


8 examples (yields 38–84%).

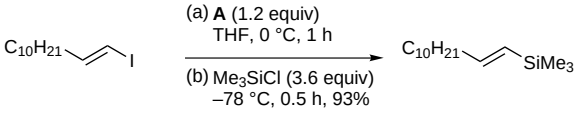
Zaragoza, F. *Tetrahedron.* **2001**, *57*, 5451.

Lithium Dibutylisopropylmagnesate ***Reagent***

The title reagent is used for the selective halogen-magnesium exchange of alkenyl halides with retention of configuration of the double bond.

i -$PrBu_2MgLi$

A



44 examples (yields 24–99%).

Inoue, A.; Kitagawa, K.; Shinokobu, H.; Oshima, K. *J. Org. Chem.* **2001**, *66*, 4333.

Cerium Trichloride Heptahydrate/Sodium Iodide ***Reagent***

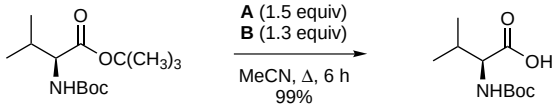
The title reagent is used in the selective deprotection of *tert*-butyl amino acids in the presence of *N*-Boc protected amines.

$CeCl_3{\cdot}7H_2O$

A

NaI

B



11 examples (yields 75–99%).

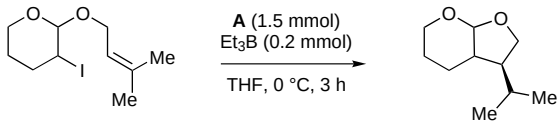
Marcantoni, E.; Massaccesi, M.; Torregiani, E. *J. Org. Chem.* **2001**, *66*, 4430.

Dichlorogallium Hydride ***Reagent***

The title reagent can be used for the triethylborane-induced radical cyclisation of halo acetals.

$HGaCl_2$

A



87%
dr = 70:30

10 examples (yields 79–99%, %de 0–68%).

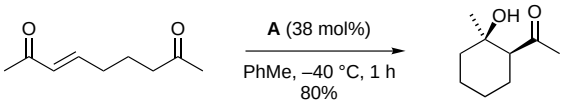
Mikami, S.; Fujita, K.; Nakamura, T.; Yorimitsu, H.; Shinokubo, H.; Matsubara, S.; Oshima, K. *Org. Lett.* **2001**, *3*, 1853.

Stryker's Reagent ***Reagent***

The title reagent can be used for the tandem conjugate reduction-aldol cyclisation of enediones to form the corresponding five- and six-membered carbocycles in good yields.

$[(Ph_3P)CuH]_6$

A



14 examples (yields 19–93%).

Chiu, P.; Szeto, C.-P.; Geng, Z.; Cheng, K.-F. *Org. Lett.* **2001**, *3*, 1901.