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:

Fabrice Anizon, Robert Chow, Philip Kocienski, and Sukhjinder Uppal of Leeds University.

Article Identifier:
1437-210X,E;2000,0,14,2141,2146,ftx,en;X01400SS.pdf

The journals regularly covered by the abstractors are:

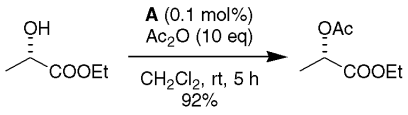
Angewandte Chemie International Edition
Bulletin of the Chemical Society of Japan
Chemical Communications
Chemistry A European Journal
Chemistry Letters
Collection Czechoslovak Chemical Communications
European Journal of Organic Chemistry
Helvetica Chimica Acta
Heterocycles
Journal of the American Chemical Society
Journal of Organic Chemistry
Organic Letters
Organometallics
Perkin Transactions 1
Synlett
Synthesis
Tetrahedron
Tetrahedron Asymmetry and Tetrahedron Letters

Bismuth Trifluoromethanesulfonate ***Catalyst***

The title reagent promotes the acylation of alcohols with acid anhydrides.

$Bi(OTf)_3$

A



A. Orita, C. Tanahashi, A. Kakuda, J. Otera *Angew. Chem. Int. Ed.* **2000**, *39*, 2877.

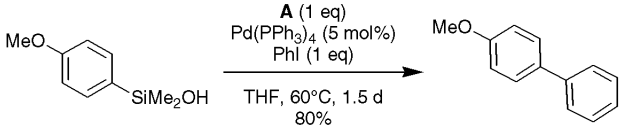
26 examples (yields 0, 2, 80-100%) are reported.

Silver(I) Oxide ***Catalyst***

The title reagent promotes the palladium-catalysed cross-coupling of silanols, silanediols, and silanetriols with a variety of iodoarenes.

Ag_2O

A



K. Hirabayashi, A. Mori, J. Kawashima, M. Suguro, Y. Nishihara, T. Hiyama *J. Org. Chem.* **2000**, *65*, 5342.

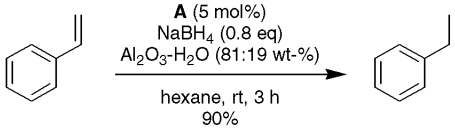
24 examples (yields 30-99%) are reported.

Nickel Chloride Hexahydrate ***Catalyst***

The title reagent catalyses the hydrogenation of alkenes with sodium borohydride and moist alumina to afford the corresponding alkanes.

$NiCl_2\ 6H_2O$

A



S. Yakabe, M. Hirano, T. Morimoto *Tetrahedron Lett.* **2000**, *41*, 6795.

9 examples (yields 90-100%) are reported.

Diethylzinc / Tris(triphenylphosphine)chlororhodium — *Catalyst*

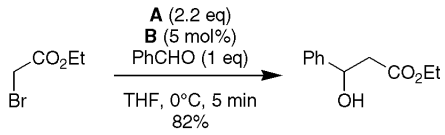
The title reagent pair is applied in the Reformatsky-type reaction promoted by rhodium-catalysis and conducted under mild conditions.

Et_2Zn

A

$RuCl(PPh_3)_3$

B



15 examples (yields 49-91%) are reported.

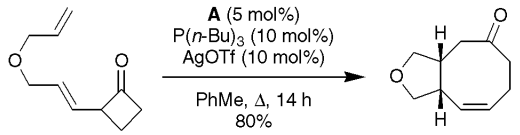
K. Kanai, H. Wakabayashi, T. Honda *Org. Lett.* **2000**, *2*, 2549.

Tetracarbonyldi-μ–chlorodirhodium(I) — *Catalyst*

The title reagent catalyses the [6+2] cycloaddition of 2-vinylcyclobutanones and alkenes for the synthesis of eight-membered rings.

$[Rh(CO)_2Cl]_2$

A

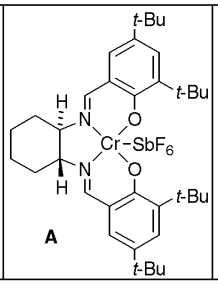


6 examples (yields 8, 17, 71-91%) are reported.

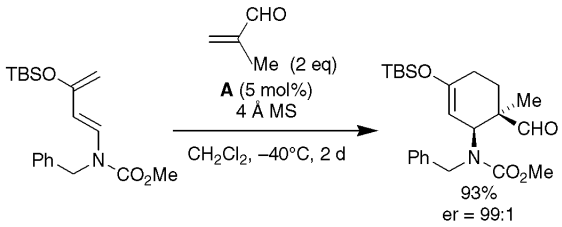
P. A. Wender, A. G. Correa, Y. Sato, R. Sun *J. Am. Chem. Soc.* **2000**, *122*, 7815.

Chromium(III)-Salen Complex — *Catalyst*

Reagent **A** catalyses the enantioselective Diels-Alder reaction of 1-amino-3-silyloxy-dienes.



A

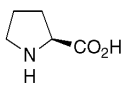


6 examples (yields 76-93%, %ee = 95->97%) are reported.

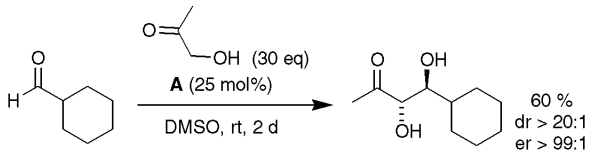
Y. Huang, T. Iwama, V. H. Rawal *J. Am. Chem. Soc.* **2000**, *122*, 7843.

L-Proline — *Catalyst*

The title reagent catalyses the asymmetric aldol reaction between hydroxyacetone and various aldehydes to afford *anti*-1,2-diols.



A



6 examples (yields 38-95%, %de = 20->90%, %ee = 67->99%).

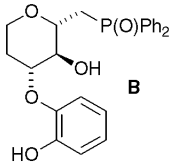
W. Notz, B. List *J. Am. Chem. Soc.* **2000**, *122*, 7386.

Titanium(IV) Isopropoxide / Phosphine Oxide Ligand — *Catalyst*

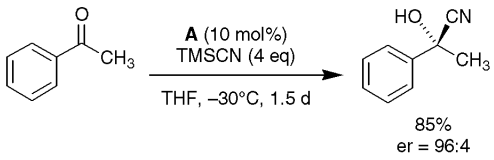
The title reagent pair catalyse the asymmetric cyanosilylation of ketones.

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

A



B



10 examples (yields 72-92%, %ee = 69-95%) are reported.

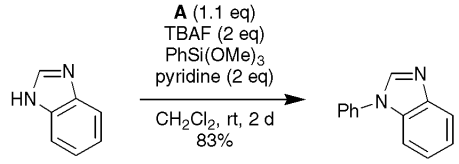
Y. Hamashima, M. Kanai, M. Shibasaki *J. Am. Chem. Soc.* **2000**, *122*, 7412.

Copper(II) Acetate — *Catalyst*

The title reagent promotes the C-N bond cross-coupling of N-H containing substrates with hypervalent aryl siloxanes.

$Cu(OAc)_2$

A



14 examples (yields 27-98%) are reported.

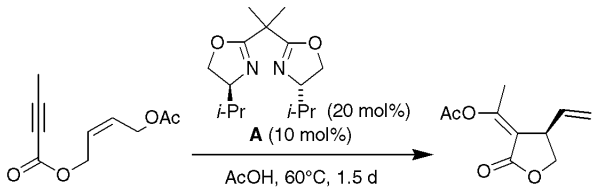
P. Y. S. Lam, S. Deudon, K. M. Averill, R. Li, M. Y. He, P. Deshong, C. G. Clark *J. Am. Chem. Soc.* **2000**, *122*, 7600.

Palladium(II) Acetate — *Catalyst*

The title reagent catalyses the enantioselective cyclisation of (*Z*)-4'-acetoxy-2'-butenyl 2-alkynoates to afford optically active γ-butyrolactones.

$Pd(OAc)_2$

A



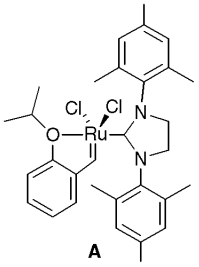
78%
er = 96:4

10 examples (yields 58-88%, %ee = 79-92%) are reported.

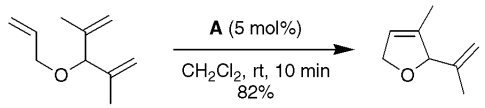
Q. Zhang, X. Lu *J. Am. Chem. Soc.* **2000**, *122*, 7604.

(4,5-DihydroIMES)Cl_2Ru=CH-*o*-O*i*PrC_6H_4 — *Catalyst*

The title reagent is a highly active, recoverable and recyclable Ru-based metathesis catalyst.



A

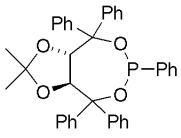


7 examples (yields 38-98%) are reported.

S. B. Garber, J. S. Kingsbury, B. L. Gray, A. H. Hoveyda *J. Am. Chem. Soc.* **2000**, *122*, 8168.

Chiral Aryl Phosphonite Ligand — *Ligand*

The title ligand is applied in the enantioselective copper-catalysed conjugate addition of dialkylzinc to nitro-olefins.



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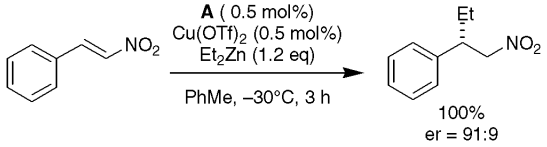


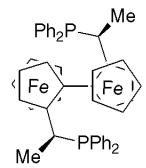
100%
er = 91:9

6 examples (yields 92-100%, %ee = 31-86%) and 8 other ligands are reported.

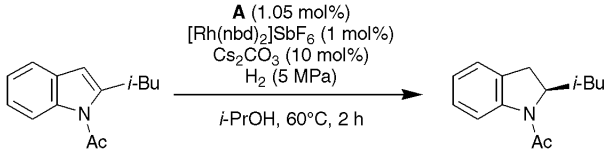
A. Alexakis, C. Benhaim *Org. Lett.* **2000**, *2*, 2579.

(*R*,*R*)-2,2"-Bis[(*S*)-(diphenylphosphino)ethyl]-1,1"-diferrocene [(*S*,*S*)-(*R*,*R*)-PhTRAP] — *Ligand*

The title ligand is used in combination with $[Rh(nbd)_2]SbF_6$ to catalyse the asymmetric hydrogenation of indoles.



A



91%
er = 96:4

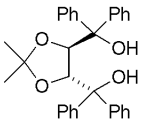
8 examples (yields 83-98%, %ee = 78-95%) are reported.

R. Kuwano, K. Sato, T. Kurokawa, D. Karube, Y. Ito *J. Am. Chem. Soc.* **2000**, *122*, 7614.

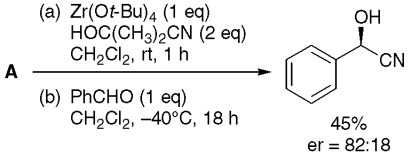
(4*R*,5*R*)-2,2-Dimethyl-α,α,α',α'-tetraphenyl-1,3-dioxolane-4,5-dimethanol (TADDOL) — *Reagent*

Chiral zirconium alkoxides prepared in situ from **A**, $Zr(Ot\text{-}Bu)_4$ and acetone cyanohydrin mediates the enantioselective Meerwein-Ponndorf-Verley cyanation of aldehydes to afford optically active cyanohydrins.

T. Ooi, K. Takaya, T. Miura, H. Ichikawa, K. Maruoka *Synlett*, **2000**, 1133.



A

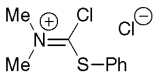


6 examples (yields 30-80%, %ee = 61-84%) are reported.

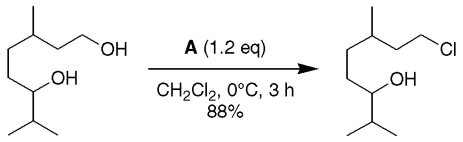
(Chlorophenylthiomethylene)dimethylammonium Chloride (CPMA) — *Reagent*

The title reagent reacts with a variety of alcohols to afford the corresponding alkyl chloride in good yields. In the presence of tetrabutylammonium bromide, the corresponding alkyl bromide is obtained.

L. Gomez, F. Gellibert, A. Wagner, C. Mioskowski *Tetrahedron Lett.* **2000**, *41*, 6049.



A

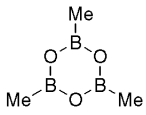


9 examples of chlorination (yields 88-97%) and bromination (yields 85-97%) are reported.

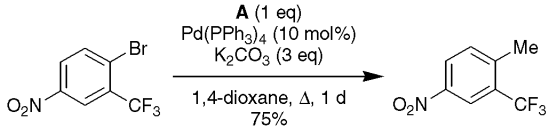
Trimethylboroxine (TMB) — *Reagent*

The title reagent is used in palladium-catalysed Suzuki-Miyaura coupling of aryl halides to afford the corresponding toluenes.

M. Gray, I. P. Andrews, D. F. Hook, J. Kitteringham, M. Voyle *Tetrahedron Lett.* **2000**, *41*, 6237.



A

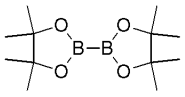


9 examples (yields 55-95%) are reported.

Bis(pinacolato)diboron / Copper(I) Trifluoromethanesulfonate Benzene Complex — *Reagent*

The title reagent pair is used for the copper(I)-catalysed boration of α,β-enones.

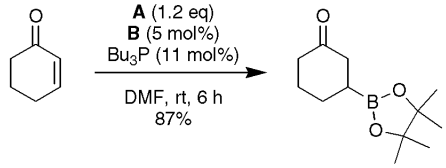
H. Ito, H. Yamanaka, J. Tateiwa, A. Hosomi *Tetrahedron Lett.* **2000**, *41*, 6821.



A

$(CuOTf)_2\ C_6H_6$

B

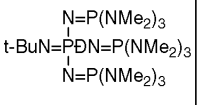


7 examples (yields 67-96%) are reported.

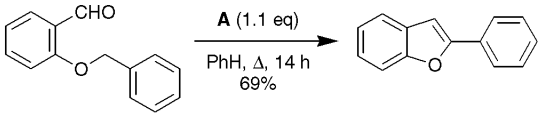
Hindered Phosphazene Base (P_4-*t*-Bu) — *Reagent*

Reagent **A** deprotonates *o*-arylmethoxy benzaldehydes, leading to a direct synthesis of benzofurans.

G. A. Kraus, N. Zhang, J. G. Verkade, M. Nagarajan, P. B. Kisanga *Org. Lett.* **2000**, *2*, 2409.



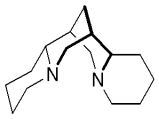
A



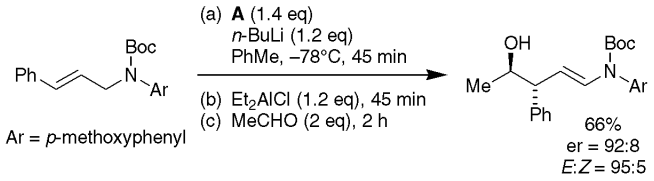
5 examples (yields 49-78%) are reported.

(–)-Sparteine — *Reagent*

The title reagent mediates the lithiation/transmetalation/substitution of *N*-Boc allylic amines affording *anti*-configured homoaldol precursors.



A



12 examples (yields 38-85%, %ee = 68-98%, 90:10 $E{:}Z \leq 98{:}2$).

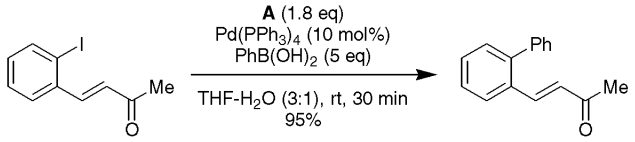
M. C. Whisler, L. Vaillancourt, P. Beak *Org. Lett.* **2000**, *2*, 2655.

Thallium(I) Ethoxide — *Reagent*

The title reagent promotes the Suzuki cross couplings of vinyl- and arylboronic acids with vinyl and aryl halides.

TlOEt

A



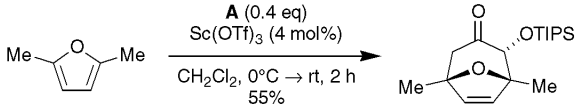
7 examples (yields 63-97%) are reported.

S. A. Frank, H. Chen, R. K. Kunz, M. J. Schnaderbeck, W. R. Roush *Org. Lett.* **2000**, *2*, 2691.

2-(Triisopropylsilyloxy)acrolein — *Reagent*

The title reagent is used in scandium triflate catalysed 4+3 cycloaddition reactions with dienes for the preparation of seven-membered rings.

A

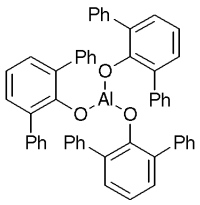


The preparation of **A** and 7 examples (yields 17-90%) are reported.

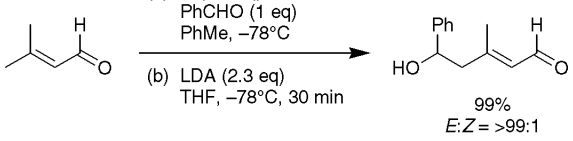
M. Harmata, U. Sharma *Org. Lett.* **2000**, *2*, 2703.

Aluminium Tris(2,6-diphenylphenoxide) (ATPH) — *Reagent*

The title reagent is used for the regio- and stereoselective synthesis of α,β-unsaturated carbonyl compounds.



A

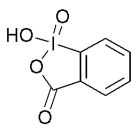


6 examples (yields 63-99%) are reported.

S. Saito, M. Shiozawa, T. Nagahara, M. Nakadai, H. Yamamoto *J. Am. Chem. Soc.* **2000**, *122*, 7847.

o-Iodoxybenzoic Acid (IBX) — *Reagent*

The title reagent oxidises a range of alcohols, ketones and aldehydes to give the corresponding α,β-unsaturated species under mild conditions.



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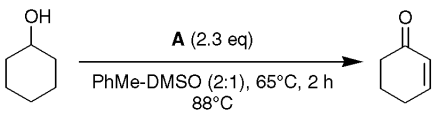
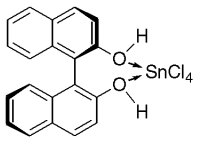


27 examples (yields 40-89%) are reported.

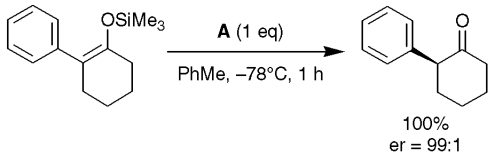
K. C. Nicolaou, Y.-L. Zhong, P. S. Baran *J. Am. Chem. Soc.* **2000**, *122*, 7596.

(*R*)-Binaphthol (BINOL)•$SnCl_4$ — *Reagent*

The title reagent is used as a chiral proton donor for the enantioselective protonation of silyl enol ethers and ketene disilyl acetals.



A



S. Nakamura, M. Kaneeda, K. Ishihara, H. Yamamoto *J. Am. Chem. Soc.* **2000**, *122*, 8120.

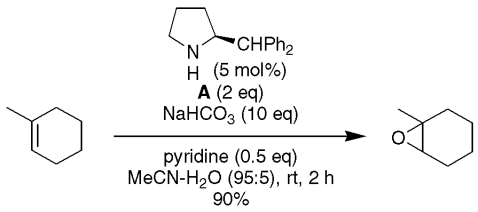
19 examples (yields 100%, %ee = 40-98%) are reported.

Oxone — *Reagent*

The title reagent is used in the epoxidation of trisubstituted alkenes by amine catalyst precursors.

$2KHSO_5.KHSO_4.K_2SO_4$

A

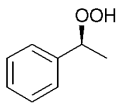


M. F. A. Adamo, V. K. Aggarwal, M. A. Sage *J. Am. Chem. Soc.* **2000**, *122*, 8317.

3 examples (yields 56-90%) are reported.

S-(–)-(1-Phenyl)ethyl Hydroperoxide — *Reagent*

The title reagent is employed for the asymmetric Weitz-Scheffer epoxidation of α,β-enones. The template effect of the potassium ion is responsible for the good enantioselectivity.



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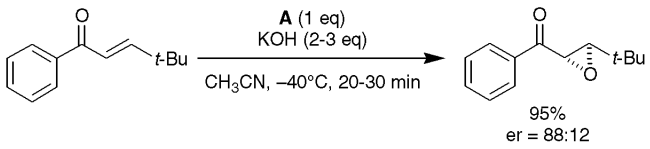
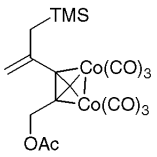


W. Adam, P. B. Rao, H.-G. Degen, C. R. Saha-Möller *J. Am. Chem. Soc.* **2000**, *122*, 5654.

13 examples (yields 84-99%, %ee = 6-90%) are reported.

Dicobalt Acetylene Complex — *Reagent*

The title reagent undergoes [5+2] cycloadditions with silyl enol ethers to afford cycloheptane derivatives.



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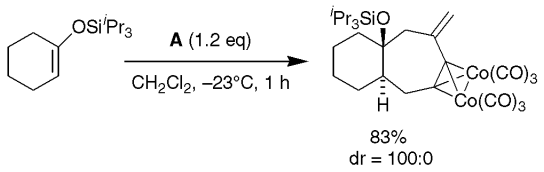
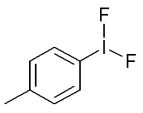


K. Tanino, T. Shimizu, M. Miyama, I. Kuwajima *J. Am. Chem. Soc.* **2000**, *122*, 6116.

9 examples (yields 63-98%, %de = 62-100%) are reported.

Difluoroiodotoluene (DFIT) — *Reagent*

The title reagent is used for the α-flourination of α-phenylsulfanyl esters.



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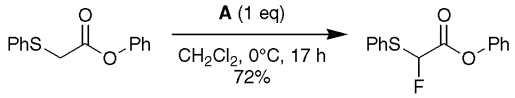

M. F. Greaney, W. B. Motherwell *Tetrahedron Lett.* **2000**, *41*, 4463.

5 examples (yields 53-80%) are reported.