

**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:

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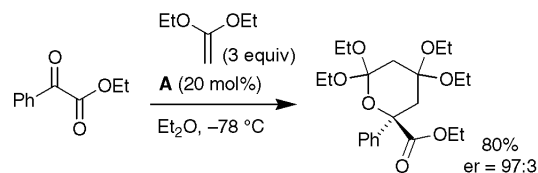
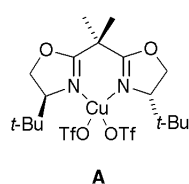
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Angewandte Chemie International Edition  
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 Chemical Communications  
 Chemistry A European Journal  
 Chemistry Letters  
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 European Journal of Organic Chemistry  
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 Journal of the American Chemical Society  
 Journal of Organic Chemistry  
 Organic Letters  
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### Chiral *tert*-Butyl-bisoxazoline-copper(II) Complex

Catalyst

Complex **A** catalyses the enantioselective addition of ketene diethylacetal to  $\alpha$ -dicarbonyl compounds for the preparation of optically active lactones.



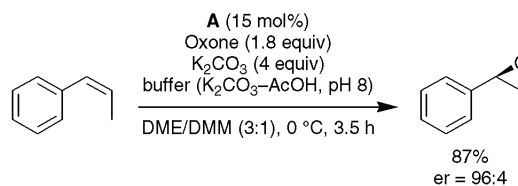
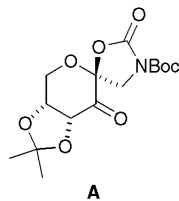
H. Audrain, K. A. Jørgensen *J. Am. Chem. Soc.* **2000**, *122*, 11543.

9 examples (yields 55–80%, %ee = 53–95%) are reported.

### Chiral Dioxirane Precursor

Catalyst

The enantioselective epoxidations of olefins are carried out using chiral ketone **A** as catalyst and oxone as oxidant.



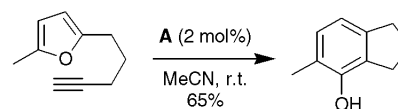
H. Tian, X. She, L. Shu, H. Yu, Y. Shi *J. Am. Chem. Soc.* **2000**, *122*, 11551.

15 examples (yields 47–91%, %ee = 80–97%) are reported.

### Gold(III) Chloride

Catalyst

The title reagent catalyses the preparation of highly substituted arenes from furans.



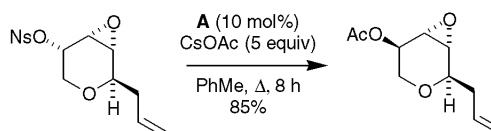
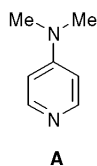
A. S. K. Hashmi, T. M. Frost, J. W. Bats *J. Am. Chem. Soc.* **2000**, *122*, 11553.

9 examples (yields 31–97%) are reported.

## Catalyst

## Dimethylaminopyridine (DMAP)

The title reagent mediates the inversion of secondary alcohols by  $S_N2$  reaction of secondary sulfonates with cesium carboxylates.



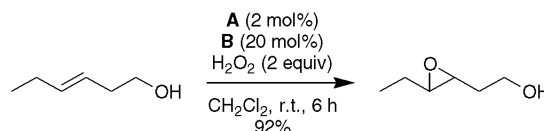
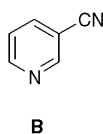
5 examples (yields 20–91%) are reported.

N. A. Hawryluk, B. B. Snider *J. Org. Chem.* **2000**, *65*, 8379.

## Methyltrioxorhenium / 3-Cyanopyridine

## Catalyst

The title reagent pair catalyses the epoxidation of alkenes with aqueous hydrogen peroxide.



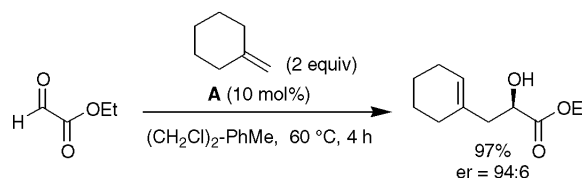
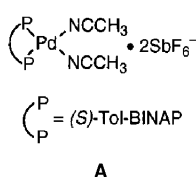
13 examples (yields 20, 86–98%) are reported.

H. Adolffson, C. Copéret, J. P. Chiang, A. K. Yudin *J. Org. Chem.* **2000**, *65*, 8651.

[Pd(CH<sub>3</sub>CN)<sub>2</sub>(S)-Tol-BINAP](SbF<sub>6</sub>)<sub>2</sub>

## Catalyst

The title reagent is an effective chiral catalyst for asymmetric glyoxylate-ene reactions to afford  $\alpha$ -hydroxy esters.



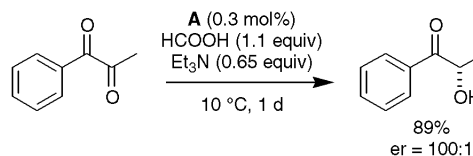
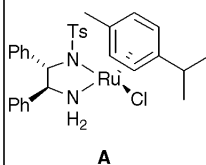
5 examples (yields 83–97%, %ee = 73–88%) are reported.

J. Hao, M. Hatano, K. Mikami *Org. Lett.* **2000**, *2*, 4059.

RuCl(*N*-(*p*-toluenesulfonyl)-1,2-diphenylethylenediamine)( $\eta^6$ -arene)

## Catalyst

The title reagent promotes the asymmetric transfer hydrogenation of 1-aryl-1,2-propanediones with formic acid and triethylamine to preferentially give optically active 1-aryl-2-hydroxy-1-propanones.



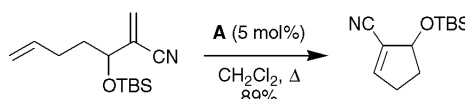
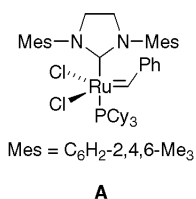
4 examples (yields 60–99%, %ee = 12–99%) are reported.

T. Koike, K. Murata, T. Ikariya *Org. Lett.* **2000**, *2*, 3833.

## Ruthenium Carbene Complex

## Catalyst

The title catalyst shows high activity in ring closing metathesis (RCM) and cross metathesis (CM) reactions.



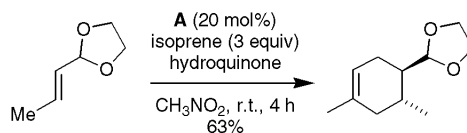
4 examples of RCM (0, 42–90%) and 8 examples of CM (85–98%).

S. Gessler, S. Randl, S. Blechert *Tetrahedron Lett.* **2000**, *41*, 9973.

## Indium Trichloride

## Catalyst

The title reagent catalyses the ionic Diels–Alder reaction of a variety of 2,3-olefinic acetals to afford the corresponding cycloadducts in good yields with good *endo* selectivities.



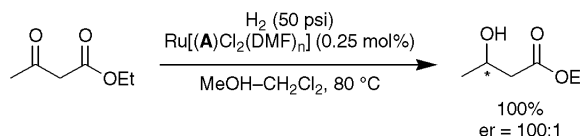
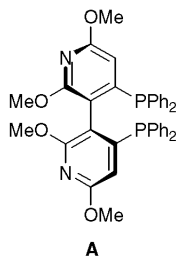
B. G. Reddy, R. Kumareswaran, Y. D. Vankar  
*Tetrahedron Lett.* **2000**, *41*, 10333.

12 examples (yields 64–75%, 80:20 ≤ *endo:exo* ≤ 94:6).

## Chiral Dipyridylphosphine Ligand

## Ligand

Ligand **A** is applied in the Ru-catalysed asymmetric hydrogenation of  $\beta$ -ketoesters.



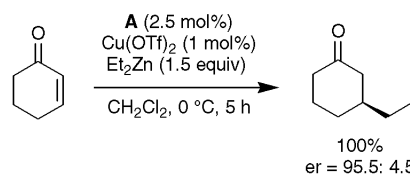
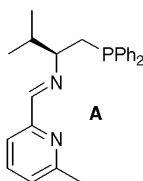
C.-C. Pai, C.-W. Lin, C.-C. Lin, C.-C. Chen, A. S. C. Chan *J. Am. Chem. Soc.* **2000**, *122*, 11513.

6 examples (yields 100%, %ee = 95–99%) are reported.

## Chiral P,N Ligand

## Ligand

**A** is an efficient chiral ligand for the copper-catalysed conjugate addition of diethylzinc to 2-cyclohexen-1-one.



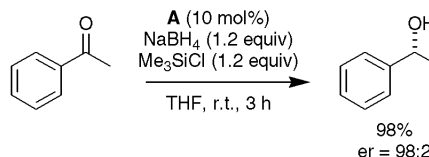
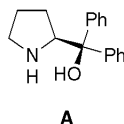
T. Morimoto, Y. Yamaguchi, M. Suzuki, A. Saitoh  
*Tetrahedron Lett.* **2000**, *41*, 10025.

1 example (yield 100%, ee = 91%) is reported.

(S)- $\alpha,\alpha$ -Diphenylpyrrolidinemethanol

## Ligand

The title reagent mediates the enantioselective reduction of achiral ketones with sodium borohydride and trimethylsilyl chloride.



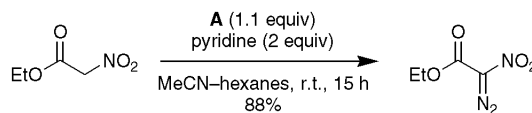
B. Jiang, Y. Feng, J. Zheng *Tetrahedron Lett.* **2000**, *41*, 10281.

8 examples (yields 93–98%, %ee 90–98%) are reported.

## Trifluoromethanesulfonyl Azide

## Reagent

The title reagent is used for the preparation of  $\alpha$ -nitro- $\alpha$ -diazocarbonyl derivatives.



A. B. Charette, R. P. Wurz, T. Ollevier *J. Org. Chem.* **2000**, *65*, 9252.

12 examples (yields 61–90%) are reported.

		<i>Reagent</i>
<b>Indium</b>		
<p>The title reagent mediates the allylation of sulfonimines with allylic bromides to afford the corresponding homoallylic sulfonamides.</p>	<p>In</p> <p><b>A</b></p>	<p>15 examples (yields 5–99%) are reported.</p>
<p>W. Lu, T. H. Chan <i>J. Org. Chem.</i> <b>2000</b>, <i>65</i>, 8589.</p>		

		<i>Reagent</i>
<b>[Bis(2-methoxyethyl)amino]sulfur Trifluoride (Deoxo-Fluor reagent)</b>		
<p>The title reagent converts chiral and achiral carboxylic acids to acid fluorides which then react with <i>N,N</i>-dimethylhydroxylamine to give the corresponding Weinreb amides in high yields and without loss of optical purity.</p>	<p><b>A</b></p>	<p>12 examples (yields 73–92%) are reported.</p>
<p>A. R. Tunoori, J. M. White, G. I. Georg <i>Org. Lett.</i> <b>2000</b>, <i>2</i>, 4091.</p>		

		<i>Reagent</i>
<b>2-Chloro-1,3-dimethyl 1<i>H</i>-Benzimidazolium Hexafluorophosphate (CMBI)</b>		
<p>The title reagent promotes the formation of sterically hindered amide and ester bonds.</p>	<p><b>A</b></p>	<p>6 examples (yields 94–99%) are reported.</p>
<p>P. Li, J. C. Xu <i>Tetrahedron</i> <b>2000</b>, <i>56</i>, 9949.</p>		

		<i>Reagent</i>
<b>Silacyclopropane</b>		
<p>1,3-Diols are stereoselectively prepared by the ZnBr<sub>2</sub>-catalysed insertion of aliphatic and aromatic carbonyl compounds into silacyclopropane <b>A</b>, followed by oxidation.</p>	<p><b>A</b></p>	<p>10 examples of insertion (yields 58–78%) are reported.</p>
<p>A. K. Franz, K. A. Woerpel <i>Angew. Chem. Int. Ed.</i> <b>2000</b>, <i>39</i>, 4295.</p>		

		<i>Reagent</i>
<b>Trimethyloxonium Tetrafluoroborate</b>		
<p>The title reagent is used for the conversion of tertiary aryl amides to methyl esters.</p>	<p>Me<sub>3</sub>OBF<sub>4</sub></p> <p><b>A</b></p>	<p>25 examples (yields 0, 72–98%) are reported.</p>
<p>G. E. Keck, M. D. McLaws, T. T. Wager <i>Tetrahedron</i> <b>2000</b>, <i>56</i>, 9875.</p>		