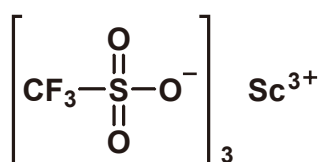


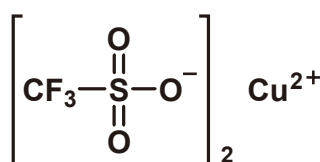
# Stable Lewis Acids in Aqueous Media

## Advantages

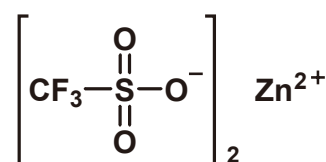
- Environmental-friendly Lewis Acids Applicable to Organic Reactions in Water
- Effectively Used for Reactions Such as Aldol Reactions and Diels-Alder Reactions
- Yb(OTf)<sub>3</sub> Can Be Reused after the Reaction.



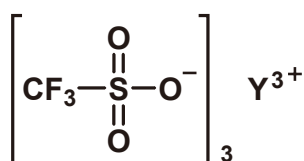
Scandium(III)  
Trifluoromethanesulfonate  
1g / 5g  
[T1663]



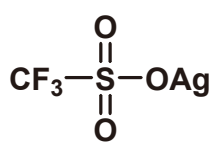
Copper(II)  
Trifluoromethanesulfonate  
5g / 25g  
[T1292]



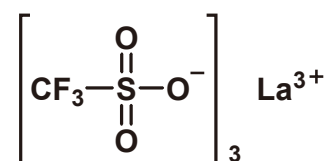
Zinc(II)  
Trifluoromethanesulfonate  
25g  
[T1294]



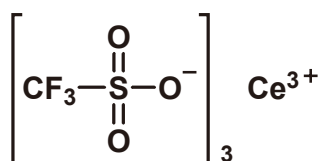
Yttrium(III)  
Trifluoromethanesulfonate  
5g / 25g  
[T1921]



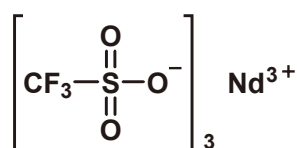
Silver  
Trifluoromethanesulfonate  
1g / 10g / 25g  
[T1331]



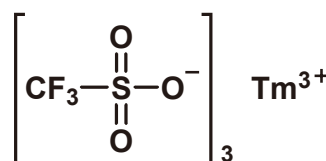
Lanthanum(III)  
Trifluoromethanesulfonate  
5g / 25g  
[T1293]



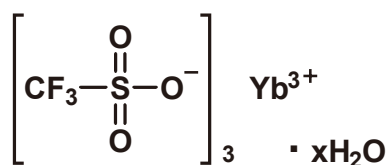
Cerium(III)  
Trifluoromethanesulfonate  
5g / 25g  
[T1918]



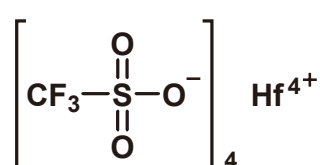
Neodymium(III)  
Trifluoromethanesulfonate  
5g / 25g  
[T1919]



Thulium(III)  
Trifluoromethanesulfonate  
5g  
[T1920]



Ytterbium(III)  
Trifluoromethanesulfonate Hydrate  
5g / 25g  
[T1610]



Hafnium(IV)  
Trifluoromethanesulfonate  
1g / 5g  
[T1708]

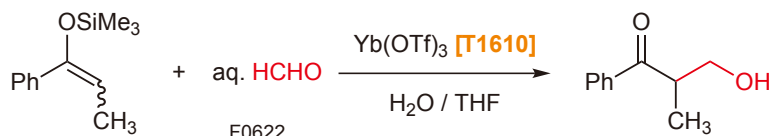


Indium(III)  
Chloride Anhydrous  
5g / 25g  
[I0778]

# Stable Lewis Acids in Aqueous Media

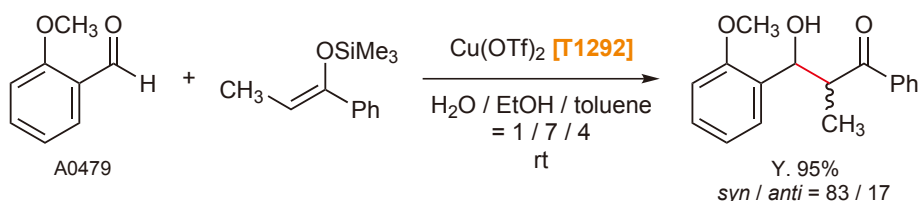
## Applications

### Aldol Reactions



1st use Y. 94%  
2nd use Y. 91%  
3rd use Y. 93%

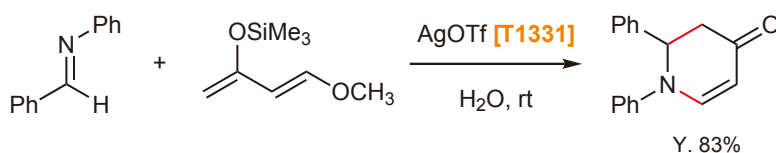
S. Kobayashi, *Chem. Lett.* **1991**, 20, 2187.



Y. 95%  
syn / anti = 83 / 17

S. Kobayashi, S. Nagayama, T. Busujima, *Chem. Lett.* **1997**, 26, 959.

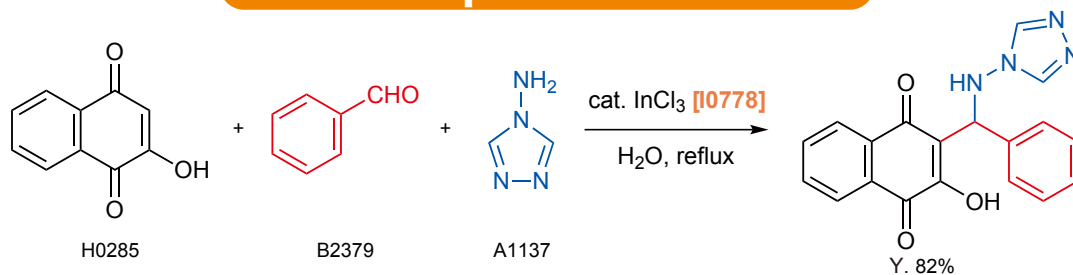
### Diels-Alder Reactions



Y. 83%

C. Loncaric, K. Manabe, S. Kobayashi, *Adv. Synth. Catal.* **2003**, 345, 475.

### Multicomponent Reactions



Y. 82%

M. Dabiri, Z. N. Tisseh, A. Bazgir, *Dyes and Pigments* **2011**, 89, 63.

For further information please refer to our website at [www.TCIchemicals.com](http://www.TCIchemicals.com).

Lewis acid



## Ordering and Customer Service

### TCI AMERICA

Tel : 800-423-8616 / 503-283-1681  
Fax : 888-520-1075 / 503-283-1987  
E-mail : Sales-US@TCIchemicals.com

### East Coast Office

Tel : 503-283-1681  
Fax : 503-283-1987  
E-mail : Sales-US@TCIchemicals.com

### TCI EUROPE N.V.

Tel : +32 (0)3 735 07 00  
Fax : +32 (0)3 735 07 01  
E-mail : Sales-EU@TCIchemicals.com

### TCI Deutschland GmbH

Tel : +49 (0)6196 64053-00  
Fax : +49 (0)6196 64053-01  
E-mail : Sales-DE@TCIchemicals.com

### Tokyo Chemical Industry UK Ltd.

Tel : +44 (0)1865 784560  
Fax : +44 (0)1865 784561  
E-mail : Sales-UK@TCIchemicals.com

### TCI Chemicals (India) Pvt. Ltd.

Tel : 1800 425 7889 / 044-2262 0909  
Fax : 044-2262 8902  
E-mail : Sales-IN@TCIchemicals.com

### 梯希爱(上海)化成工业发展有限公司

Tel : 800-988-0390 / 021-67121386  
Fax : 021-6712-1385  
E-mail : Sales-CN@TCIchemicals.com

### TOKYO CHEMICAL INDUSTRY CO., LTD.

Tel : +81 (0)3-5640-8878  
Fax : +81 (0)3-5640-8902  
E-mail : globalbusiness@TCIchemicals.com

Availability, price or specification of the listed products are subject to change without prior notice. Reproduction forbidden without the prior written consent of Tokyo Chemical Industry Co., Ltd.