

## Asymmetric Transfer Hydrogenation Catalysts

In addition to simple experimental procedures, asymmetric transfer hydrogenation has the advantage of avoiding the use of high pressure hydrogen gas by using 2-propanol or formic acid as a hydrogen source.

Ruthenium complexes bearing a chiral bidentate nitrogen ligand and an arene ligand are highly efficient catalysts for the reduction of a broad range of ketones and imines to chiral alcohols and amines, respectively.

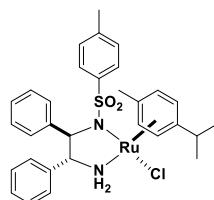
### Asymmetric Transfer Hydrogenation Catalysts

#### **RuCl[(R,R)-Tsdpen](p-cymene)**

CAS No. 192139-92-7

Formula C<sub>31</sub>H<sub>35</sub>CIN<sub>2</sub>O<sub>2</sub>SRu

M.W. 636.22

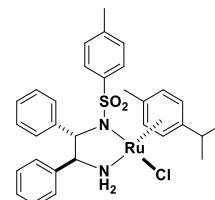


#### **RuCl[(S,S)-Tsdpen](p-cymene)**

CAS No. 192139-90-5

Formula C<sub>31</sub>H<sub>35</sub>CIN<sub>2</sub>O<sub>2</sub>SRu

M.W. 636.22

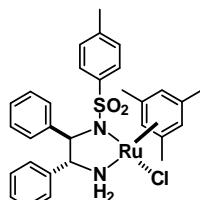


#### **RuCl[(R,R)-Tsdpen](mesitylene)**

CAS No. 174813-82-2

Formula C<sub>30</sub>H<sub>33</sub>CIN<sub>2</sub>O<sub>2</sub>RuS

M.W. 622.18

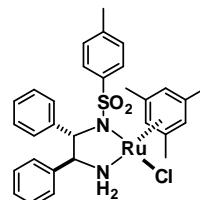


#### **RuCl[(S,S)-Tsdpen](mesitylene)**

CAS No. 174813-81-1

Formula C<sub>30</sub>H<sub>33</sub>CIN<sub>2</sub>O<sub>2</sub>RuS

M.W. 622.18

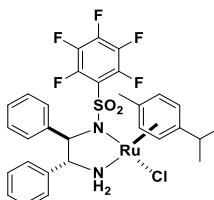


#### **RuCl[(R,R)-Fsdpen](p-cymene)**

CAS No. 1026995-71-0

Formula C<sub>30</sub>H<sub>28</sub>CIN<sub>2</sub>O<sub>2</sub>F<sub>5</sub>RuS

M.W. 712.14

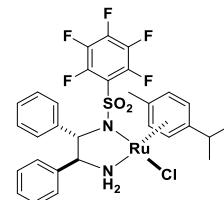


#### **RuCl[(S,S)-Fsdpen](p-cymene)**

CAS No. 1026995-72-1

Formula C<sub>30</sub>H<sub>28</sub>CIN<sub>2</sub>O<sub>2</sub>F<sub>5</sub>RuS

M.W. 712.14

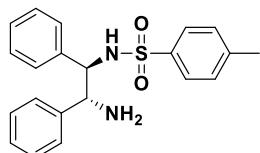


## Asymmetric Transfer Hydrogenation Ligands

---

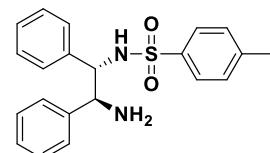
### **(R,R)-TsDPEN**

<b>CAS No.</b>	144222-34-4
<b>Formula</b>	C <sub>21</sub> H <sub>22</sub> N <sub>2</sub> O <sub>2</sub> S
<b>M.W.</b>	366.48



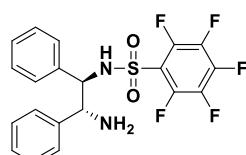
### **(S,S)-TsDPEN**

<b>CAS No.</b>	167316-27-0
<b>Formula</b>	C <sub>21</sub> H <sub>22</sub> N <sub>2</sub> O <sub>2</sub> S
<b>M.W.</b>	366.48



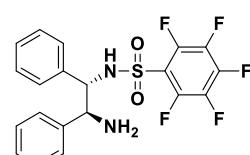
### **(R,R)-FsDPEN**

<b>CAS No.</b>	1026785-12-5
<b>Formula</b>	C <sub>20</sub> H <sub>15</sub> N <sub>2</sub> O <sub>2</sub> F <sub>5</sub> S
<b>M.W.</b>	442.40



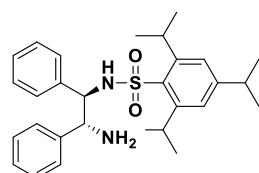
### **(S,S)-FsDPEN**

<b>CAS No.</b>	313342-24-4
<b>Formula</b>	C <sub>20</sub> H <sub>15</sub> N <sub>2</sub> O <sub>2</sub> F <sub>5</sub> S
<b>M.W.</b>	442.40



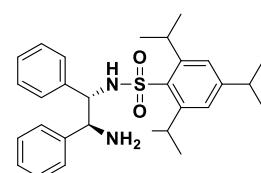
### **(R,R)-TipsDPEN**

<b>CAS No.</b>	852212-92-1
<b>Formula</b>	C <sub>29</sub> H <sub>38</sub> N <sub>2</sub> O <sub>2</sub> S
<b>M.W.</b>	478.69



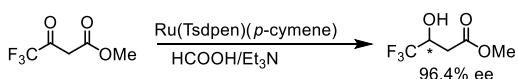
### **(S,S)-TipsDPEN**

<b>CAS No.</b>	247923-41-7
<b>Formula</b>	C <sub>29</sub> H <sub>38</sub> N <sub>2</sub> O <sub>2</sub> S
<b>M.W.</b>	478.69



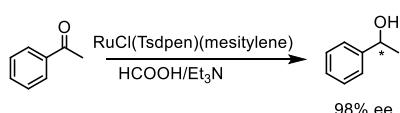
## Tech Note

### 1 Asymmetric Transfer Hydrogenation of $\beta$ -Keto Ester



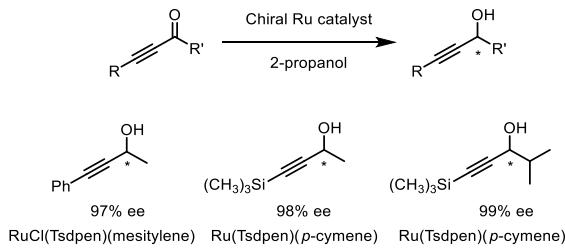
JP4015450B, US6723871B (Takasago).

### 2 Asymmetric Transfer Hydrogenation Acetophenone



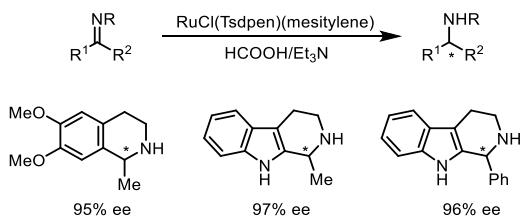
Noyori, R. *J. Am. Chem. Soc.* **1996**, *118*, 2521.  
doi: [10.1021/ja954126l](https://doi.org/10.1021/ja954126l)

### 3 Asymmetric Transfer Hydrogenation of $\alpha,\beta$ -Acetylenic Ketones



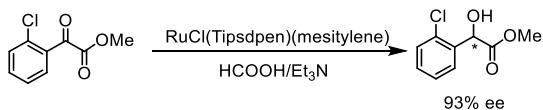
Matsumura, K. *J. Am. Chem. Soc.* **1997**, *119*, 8738.  
doi: [10.1021/ja971570a](https://doi.org/10.1021/ja971570a)

### 4 Asymmetric Transfer Hydrogenation of Imines



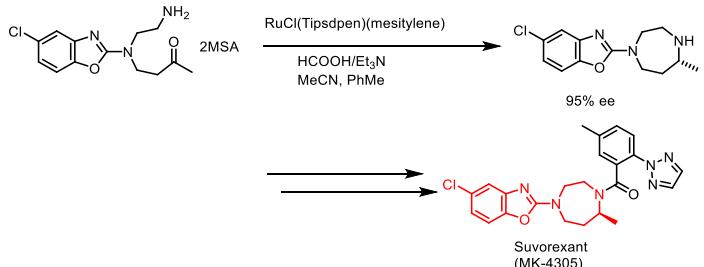
Noyori, R. *J. Am. Chem. Soc.* **1996**, *118*, 4916.  
doi: [10.1021/ja960364k](https://doi.org/10.1021/ja960364k)

### 5 Asymmetric Transfer Hydrogenation of $\alpha$ -Keto Ester



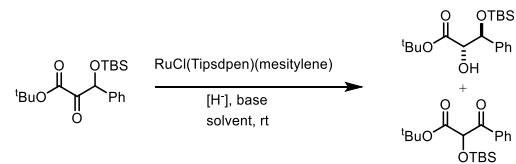
Yin, L. *J. Organomet. Chem.* **2009**, *694*, 2092.  
doi: [10.1016/j.jorgchem.2009.02.008](https://doi.org/10.1016/j.jorgchem.2009.02.008)

### 6 Asymmetric Reductive Amination



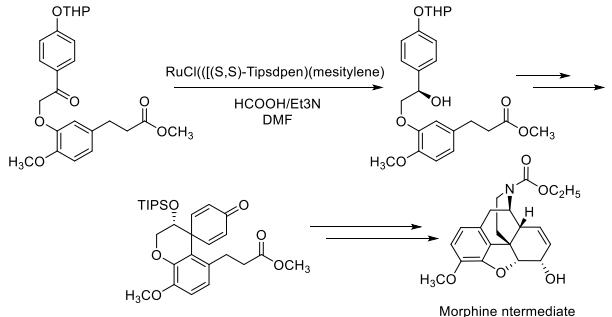
Strotman, N. A. *J. Am. Chem. Soc.* **2011**, *133*, 8362-8371.  
doi: [10.1021/ja202358f](https://doi.org/10.1021/ja202358f)

### 7 Dynamic Kinetic Resolution



Kimberly, M. *Organic Lett.* **2010**, *12*, 2864.  
doi: [10.1021/ol100996w](https://doi.org/10.1021/ol100996w)

### 8 Application



Gaunt, M.J. *Angew Chem Int Ed* **2014**, *53*, 13498.  
doi: [10.1002/anie.201408435](https://doi.org/10.1002/anie.201408435)