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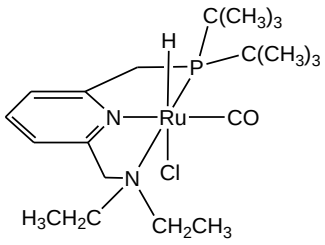
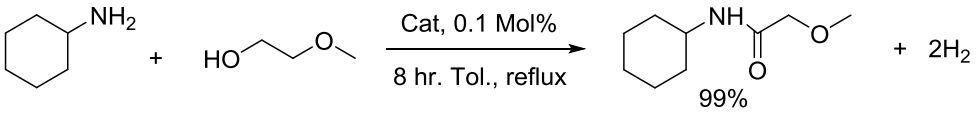
Catalog # 44-0081 Carbonylchlorohydrido[6-(di-t-butylphosphinomethyl)-2-(N,N-diethylaminomethyl)pyridine]ruthenium(II), min. 98% (Milstein Catalyst Precursor)



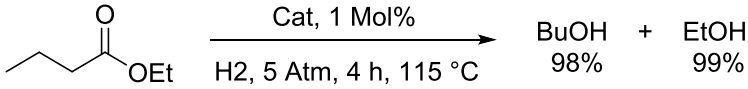
The following technical notes refer to the synthesis and use of the Milstein catalyst (44-0091), which can be generated in situ from the title compound.

Technical Notes:

1. Ruthenium catalyst for the direct synthesis of amides from alcohols and primary amines.
2. Ruthenium catalyst for the hydrogenation of esters in high yields under mild pressure and neutral conditions.
3. Ruthenium catalyst for the dehydrogenative coupling of alcohols to form esters in high yields under neutral conditions.
4. Ruthenium catalyst for the synthesis of amides from esters and amines with liberation of hydrogen gas.
5. Ruthenium catalyst for the hydrogenation of 3-methyl-2-oxalidinone



Tech. Note (1)
Ref. (1)



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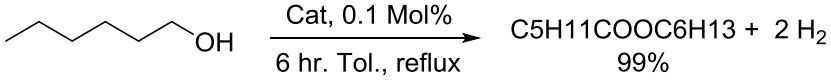
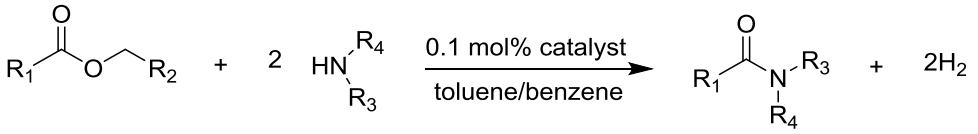


Tech. Note (3)
Ref. (3,4)



Tech. Note (4)
Ref. (5)

Tech. Note (5)
Ref. (6)

References:

1. *Science,* **2007**, *317*, 790.
2. *Angew. Chem. Int. Ed.,* **2006,** *45,* 1113.
3. *J. Am. Chem., Soc,* **2005,** *127,* 12429.
4. *J. Am. Chem., Soc,* **2005,** *127,* 10840.
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6. *ACS Catal.,* **2015**, *5*, 2416.