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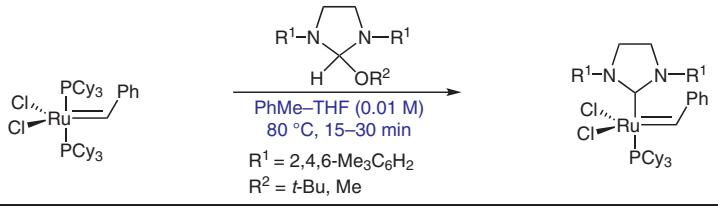
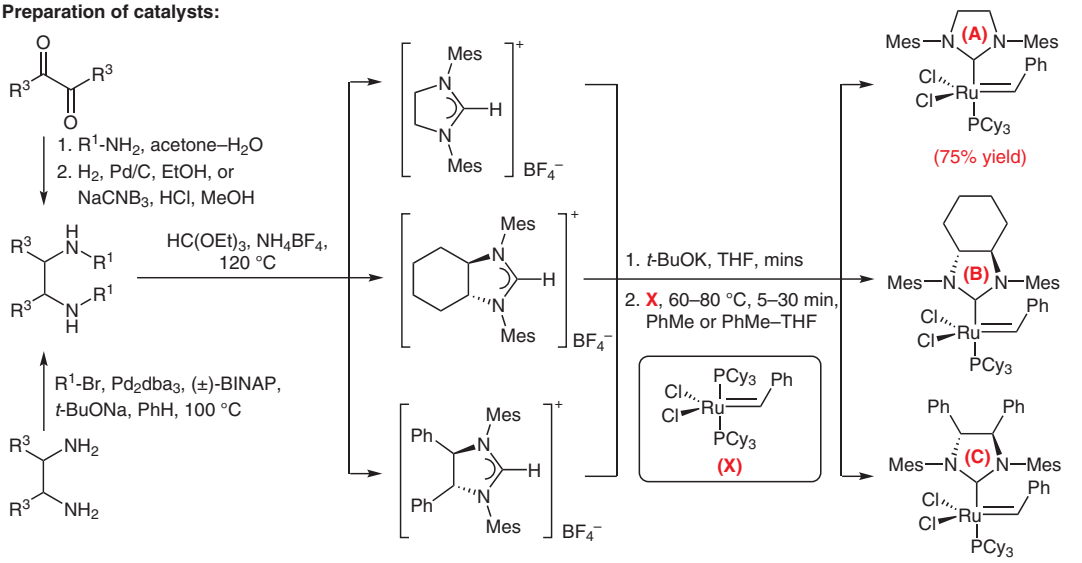
Synthesis and Activity of a New Generation of Ruthenium-Based Olefin Metathesis Catalysts Coordinated with 1,3-Dimesityl-4,5-dihydroimidazol-2-ylidene Ligands

Org. Lett. **1999**, *1*, 953–956.

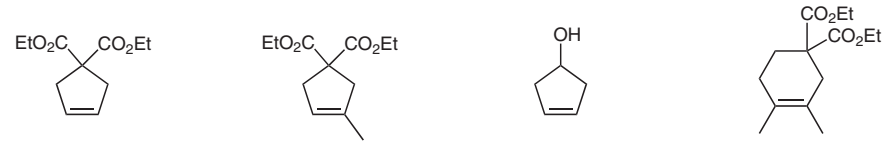
Grubbs Catalyst 2nd Generation: Synthesis and Activity of Ruthenium-Based Olefin Metathesis Catalysts



Preparation of catalysts:



Selected examples of RCM products:



yield (X) = quant.
(A) = quant.
(B) = quant.

yield (X) = 20%
(A) = quant.
(B) = quant.

yield (X) = 0%
(A) = quant.
(B) = quant.

yield (X) = 0%
(A) = 90%
(B) = 87%

Significance: Grubbs and co-workers reported a direct approach towards the preparation of the 4,5-dihydroimidazol-2-ylidene-substituted ruthenium-based catalysts. Compared to their predecessor, these 2nd generation catalysts display higher reactivity, better stability, and improved functional group tolerance.

Comment: Conveniently, these 2nd generation catalysts are air- and water-tolerant and can be handled without great loss in activity. Given the increased RCM activities observed with (**A**) and (**B**), the authors studied RCM at lower catalyst loadings and found 0.05 mol% to be an optimal lower limit in both cases.

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Category

Metals in Synthesis

Key words

Grubbs catalysts

olefin metathesis

ruthenium catalysis

ring-closing metathesis