



SONEAS

Formerly known as
ubichem
PHARMA GROUP

SONEAS enters strategic partnership with XiMo AG to produce metathesis catalysts

Swiss-based XiMo AG focuses on the development and application of proprietary metathesis catalysts for use in the specialty chemical, agro chemical, renewables, pharmaceutical, polymers and advanced materials sectors (<http://www.ximo-inc.com>).

The molybdenum and tungsten catalysts that represent a new generation of metathesis catalysts are based on the breakthrough scientific research of the two founders, Amir H. Hoveyda (Boston College), Richard R. Schrock (Massachusetts Institute of Technology), co-winner of the 2005 Nobel Prize in Chemistry. XiMo exclusively licenses the relevant Mo/W metathesis patents from MIT, BC and Max-Planck Institute which serves the basis of XiMo's growing proprietary catalyst portfolio.

SONEAS set-up a dedicated process development laboratory to be able to meet the special conditions used during the synthesis of the catalyst where successfully started the catalyst-production in kg-quantities as a result of the joint development of a large-scale process based on the laboratory procedure provided by XiMo. Thus, XiMo clients can benefit by considering SONEAS for the scale-up of their synthetic routes and, similarly, SONEAS' clients benefit from using XiMo's catalyst in their synthetic procedures, assuming they have an agreement with XiMo to access the company's technology.

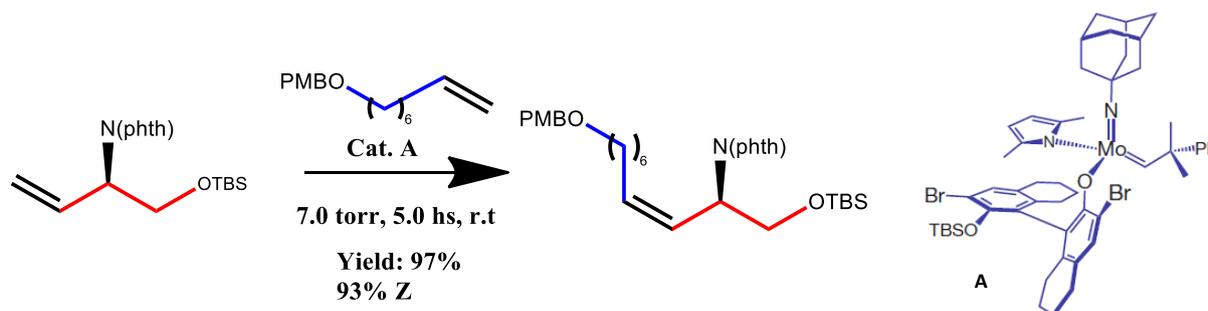
Mo and W catalysts are particularly efficient and valuable catalysts in various selective transformations (including regio-, stereo- and enantioselective/asymmetric metathesis reactions) of industrial interest. From relatively simple intermediates to complex natural products synthesis, those catalysts can be widely used.

The catalyst loading can be reduced down to 25 ppm after necessary optimization.

The following examples will demonstrate the utility of the catalysts:

Z-selective metathesis reactions

Some Mo and W based catalysts have extremely high Z-selectivity (up to 99%), which is a critical asset in certain projects.

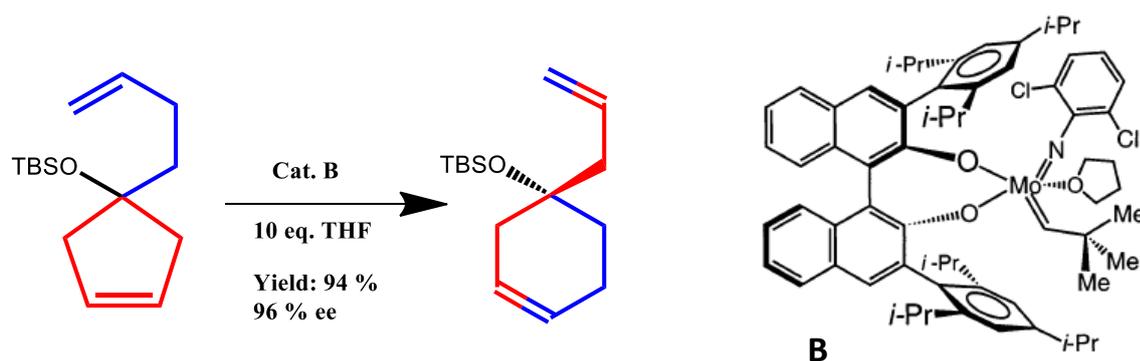


Lit.: Hoveyda, Schrock et al. *Nature* **2011**, 471, 461-465.

Enantioselective Metathesis Reaction

Synthesis of Cyclic Tertiary Ethers through a Mo-Catalyzed Enantioselective Rearrangement of Protected Achiral Cyclopentenol

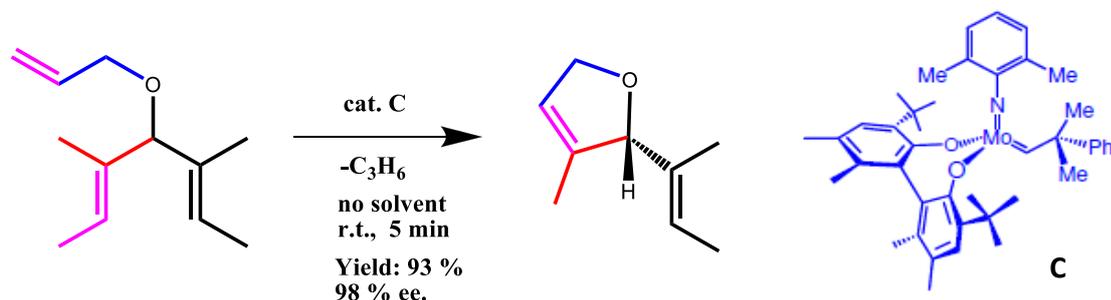
Mo and W based catalysts that are chiral at metal, could achieve high enantiomeric excesses in typical reaction, e.g. from prochiral starting materials.



Lit.: Schrock and Hoveyda et al *J. Am. Chem. Soc.* **2002**, 124, 10779-10784.

Asymmetric Ring-Closing Metathesis (RCM)

Catalytic Enantioselective Desymmetrization

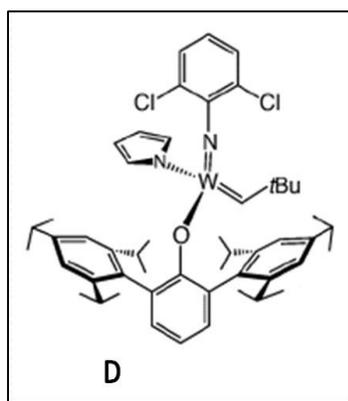
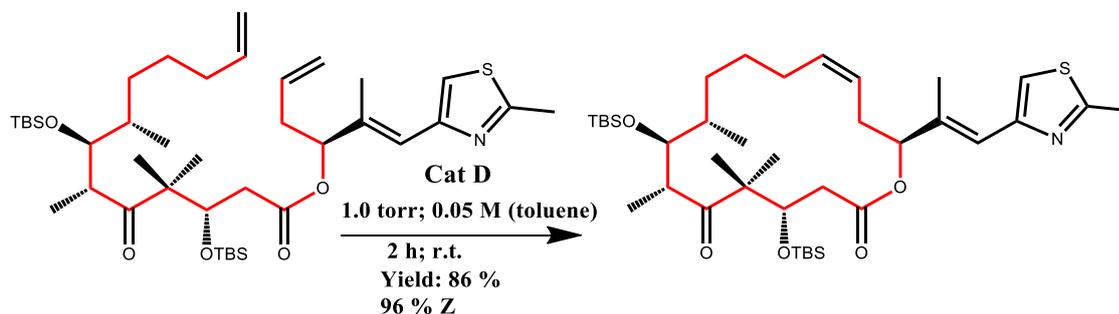


Lit.: Hoveyda and Schrock et al *J. Am. Chem. Soc.* **1998**, *120*, 9720-9721.

Further examples: Hoveyda et al. *Angew. Chem. Int. Ed.* **2010**, *49*, 34-44.

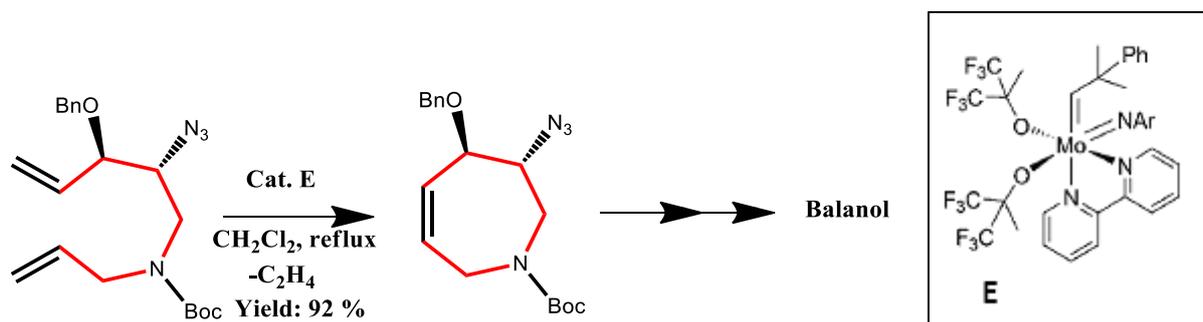
Z-selective catalytic ring-closing metathesis (RCM) reactions:

Synthesis of macrocyclic natural products (such as Epothilon)



Lit.: Hoveyda, Schrock et al. *Chem. Eur. J.* **2013**, *19*, 2726-2740; Hoveyda, Schrock et al. *Nature* **2011**, *471*, 461-465 and *Nature* **2011**, *479*, 88-93.

Synthesis of an important intermediate of Balanol, a potent inhibitor of Protein kinase C (PKC):



Air-stable stable variant of the Schrock's pro-catalyst is used that can be activated by adding ZnCl_2 (in toluene at $100\text{ }^\circ\text{C}$ for 30 min).

Lit.: Fürstner et al *J. Org. Chem.*, **2000**, 65 (6), 1738–1742; Fürstner et al *Angew. Chem. Int. Ed.* **2011**, 50, 7829-7832.

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