

WINNERS of CHEMISTRY NOBEL PRIZE

2005: Yves Chauvin, Robert Grubbs e Richard Schrock

for the development of the metathesis method in organic synthesis.

2001: WILLIAM S. KNOWLES, and RYOJI NOYORI,

for their work on chirally catalysed hydrogenation reactions

K. BARRY SHARPLESS for his work on chirally catalysed oxidation reactions

1996: ROBERT F. CURL, Jr. , SIR HAROLD W. KROTO , and RICHARD E. SMALLEY

for their discovery of fullerenes

1987: DONALD J. CRAM , JEAN-MARIE LEHN and CHARLES J. PEDERSEN

for their development and use of molecules with structure-specific interactions of high selectivity

1981: KENICHI FUKUI and ROALD HOFFMANN

for their theories, developed independently, concerning the course of chemical reactions

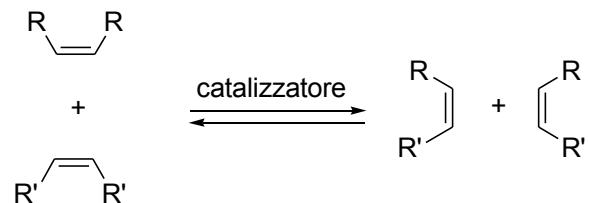
1965: ROBERT BURNS WOODWARD for his outstanding achievements in the art of organic synthesis

1950: OTTO PAUL HERMANN DIELS and KURT ALDER

for their discovery and development of the diene synthesis

REAZIONE DI METATESI

Principio generale di metatesi di olefine sostituite in modo simmetrico.

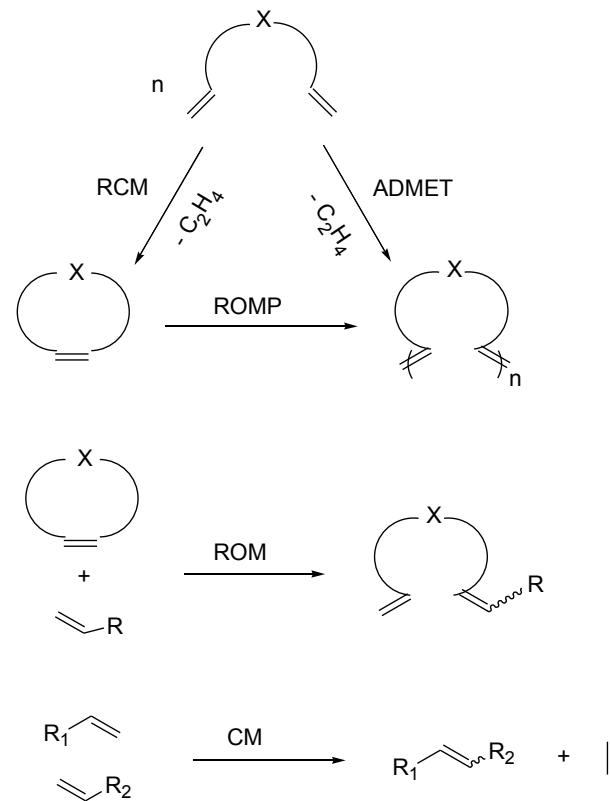


Yves Chauvin, Robert Grubbs e Richard Schrock

Nobel per la Chimica 2005

- K. C. Nicolau, P. G. Bulger, D. Sarlah, Metathesis Reactions in Total Synthesis, *Angew. Chem. Int. Ed.*, 44, 4490-4527 (2005).
- F. Amblard, S. P. Nolan, L. A. Agrofoglio, Methatesis strategy in nucleoside chemistry, *Tetrahedron*, 61, 7067-7080 (2005).
- R. H. Grubbs, Olefin methatesis, *Tetrahedron*, 60, 7117-7140 (2004).
- A. Deiters, S. F. Martin, Synthesis of oxygen- and nitrogen-containing heterocycles by ring-closing methatesis, *Chem. Rev.*, 104, 2199-2238 (2004).
- A. D. Piscopio, J. E. Robinson, Recent applications of olefin methatesis to combinatorial chemistry, *Curr. Opin. Chem. Biol.*, 8, 245-254 (2004).
- S. J. Connolly, S. Blechert, Recent developments in olefin cross-methatesis, *Angew. Chem. Int. Ed.*, 42, 1900-1923 (2003).

Diverse reazioni di metatesi di olefine



RCM = ring-closing metathesis

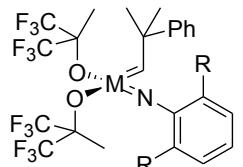
ROM = ring-opening metathesis

ROMP = ring-opening metathesis polymerization

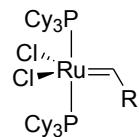
ADMET = acyclic diene methatasis polymerization

CM = cross-metathesis

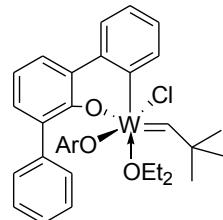
Alcuni catalizzatori e precatalizzatori usati nelle reazioni di metatesi



1 ($M = Mo, W$)

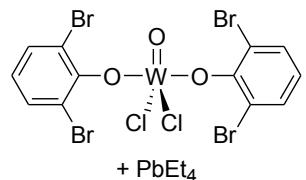


2

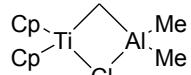


3

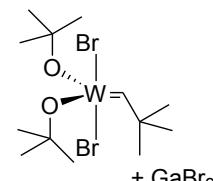
$R = Ph, CH=CPH_2, \text{ecc.}$



4



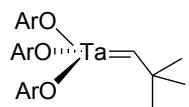
5



6

$[\text{MeReO}_3] / \text{Al}_2\text{O}_3$

7



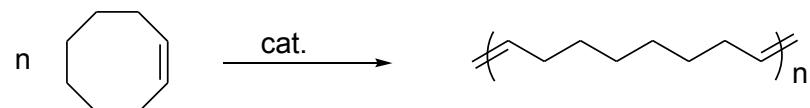
8 ($\text{Ar} = 2,6-iPr_2C_6H_3$)

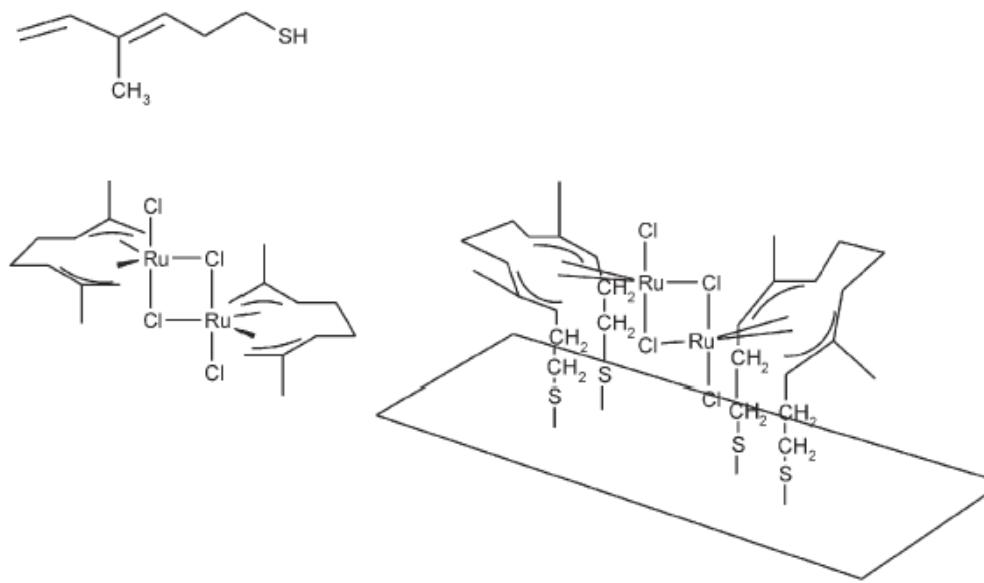
Reazione di metatesi applicata ad alcuni processi industriali

Processo Norsorex

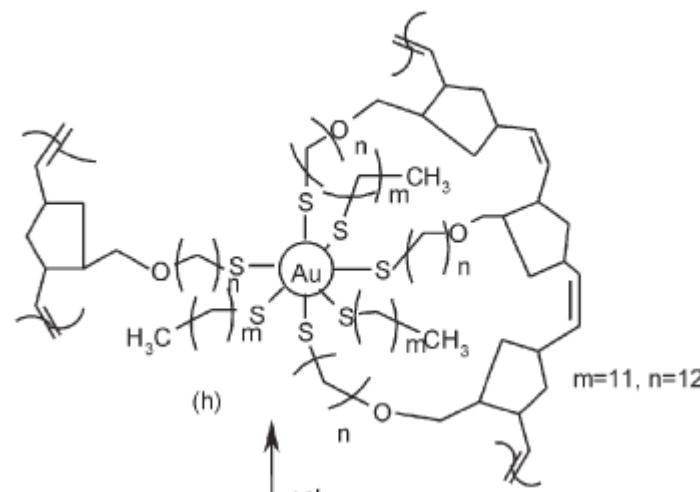


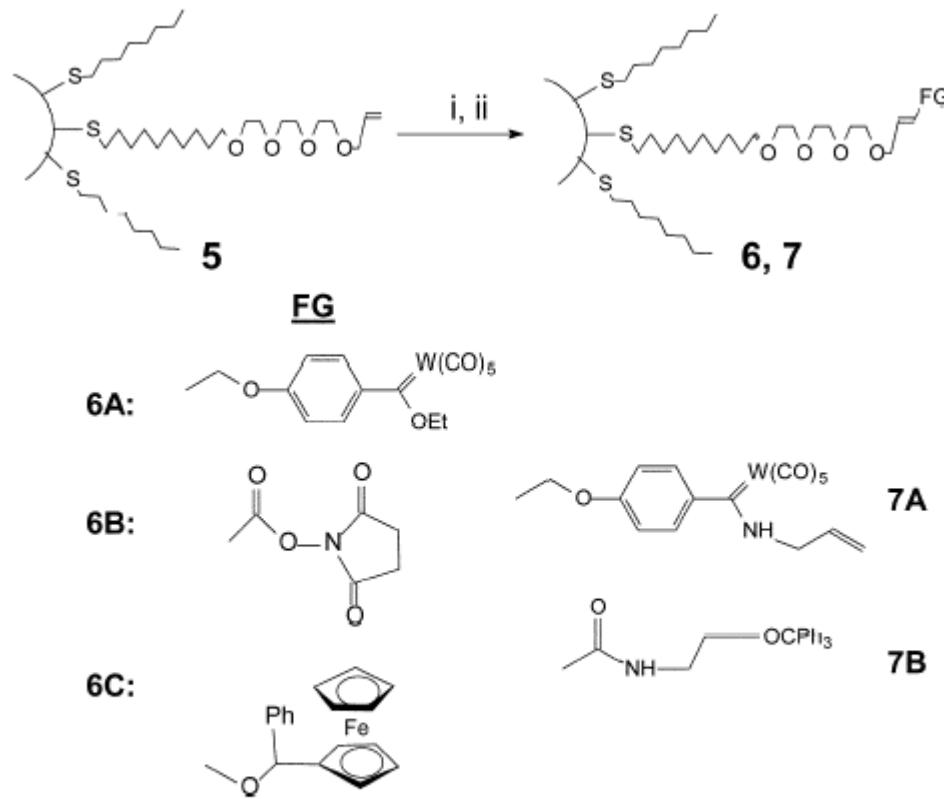
Processo Hüls-Vestenamer





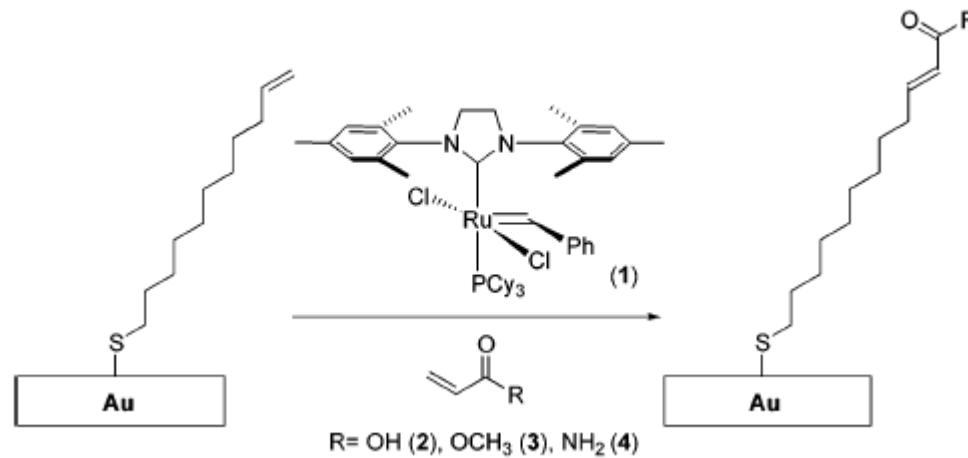
Scheme 19 A colloid-bound catalyst for olefin metathesis polymerization: the ligand used for colloid preparation, the homogeneous catalyst, and the surface-bound catalyst.¹³⁴



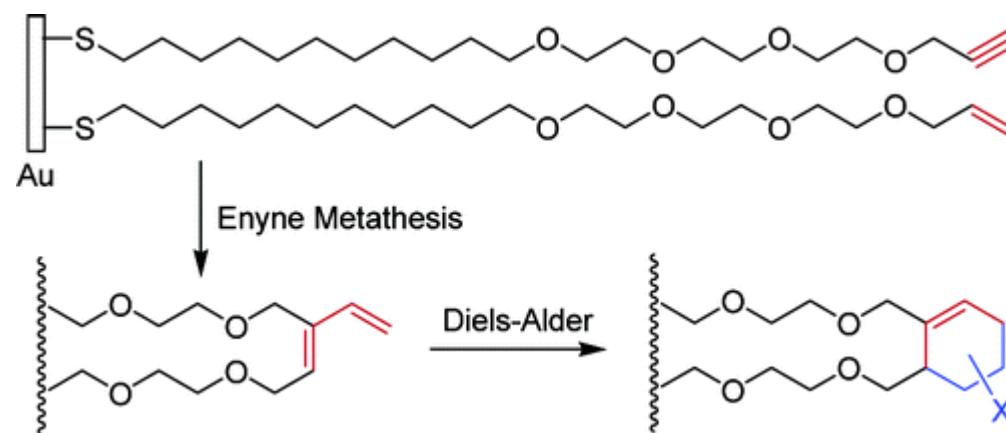


Scheme 2 Cross-metathesis reaction followed by aminolysis on gold colloids. *Reagents and conditions:* i, $\text{CH}_2=\text{CH}-\text{FG}1$, $\text{Cl}_2(\text{Pcy}_3)_2\text{Ru}=\text{CH}-\text{Ph}$ (cat.), CH_2Cl_2 , 12 h; ii, RNH_2 , CH_2Cl_2 , 5 h.

Scheme 1. Schematic Description of the Procedure.

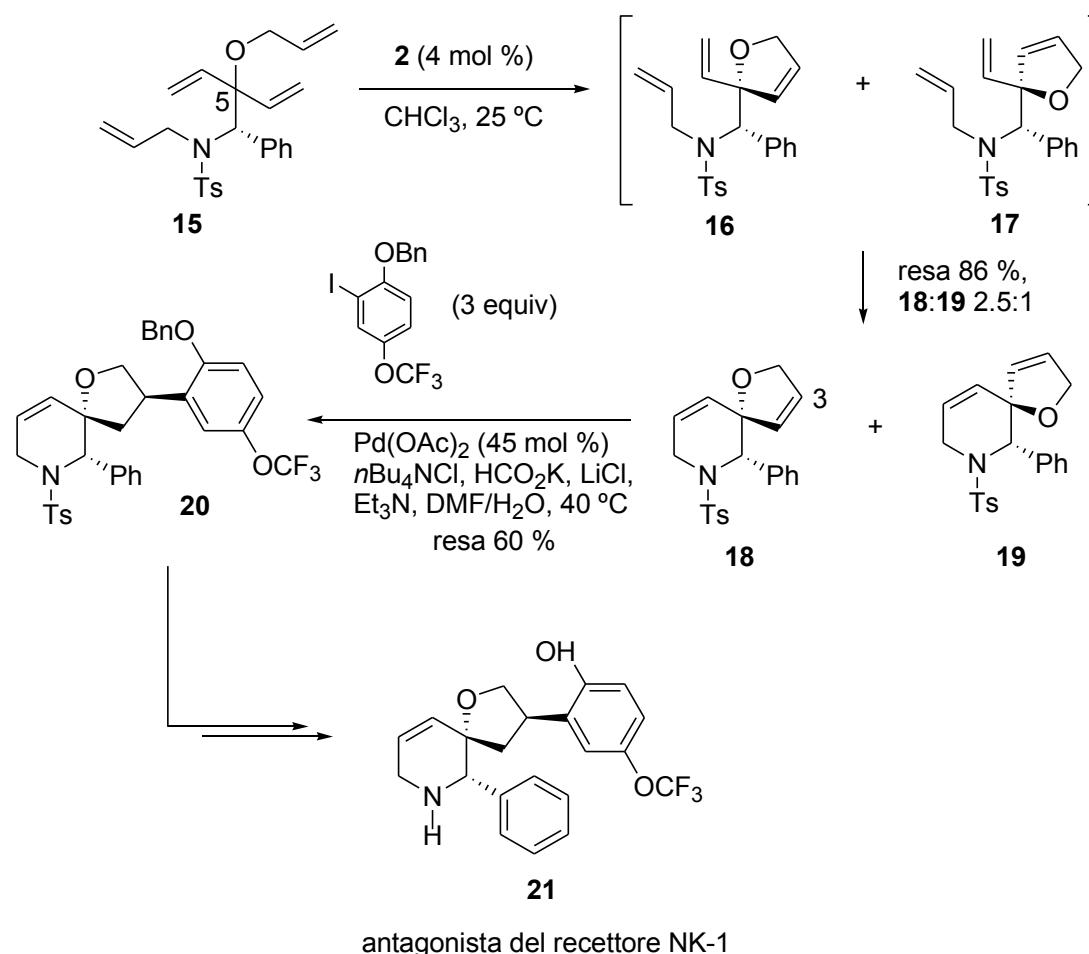


Langmuir 2003, 19, 8141-8143

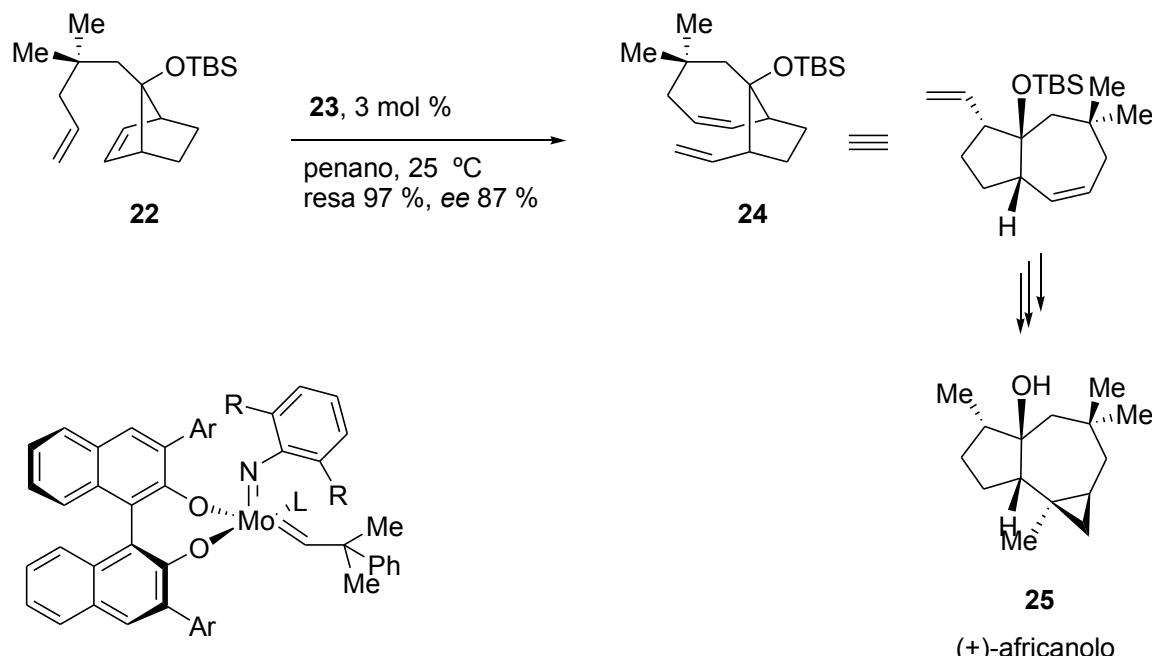


Langmuir 2005, 21, 10311-10315

Sintesi dell'antagonista del recettore NK-1 via doppia RCM diastereoselettiva e reazione di Heck riduttiva (Merck)



Reazioni di metatesi consecutive di chiusura e apertura di anello nella sintesi enantioselettiva del (+)-africanolo



R = *i*Pr, Ar = 2,4,6-*i*Pr₃C₆H₂, L = THF