Robert V. Stevens

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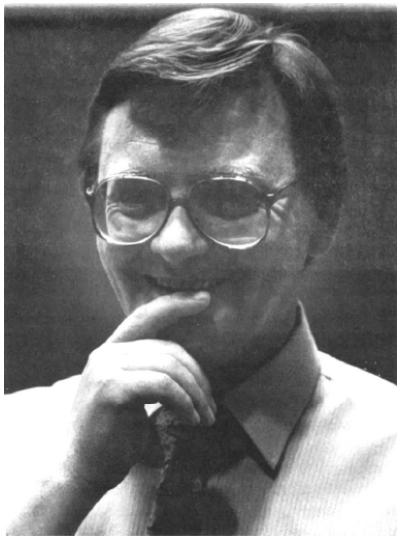


Robert V. Stevens

Biographical Information:

-Born on March 24, 1941 in Mason City, Iowa
-Received B.S. degree in 1963 in Iowa State University
-Ph. D at Indiana University with Professor Ernest Wenkert (1963-1966)
-Appointed to the faculty of Rice University (1966-1977)
-Professor of Chemistry in UCLA (1977-1984)
-Deceased on March 9, 1984

"Professor Stevens was a special kind of teacher. He would shuffle into an undergraduate class, clear his throat, and say, "Unhuh." The metamorphosis came when he picked up the chalk. No one who saw Professor Stevens work with chalk and the elegant structures he drew will forget the simple beauty of his lectures. He was a transformed man with chalk in his hands. His dry wit and diffident charm cane through with clarity, and his sense of style and art pervaded the room"

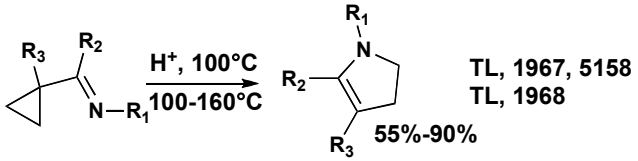
-Professor Orville L. Chapman of UCLA

Summary of research interests throughout Professor Stevens's career:

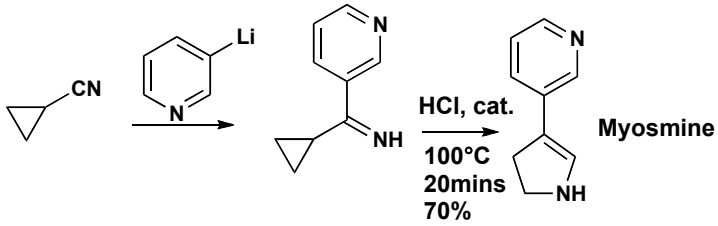
-Total synthesis of natural products
  -alkaloids
  -steroids
  -vitamins
-Development of chemical methods in synthesis
  -rearrangement of cycloproplyimines
  -stereocontrolled nucleophilic attack on immonium ions
  -nitrone addtions

Studies on total Syntheses of Alkaloids

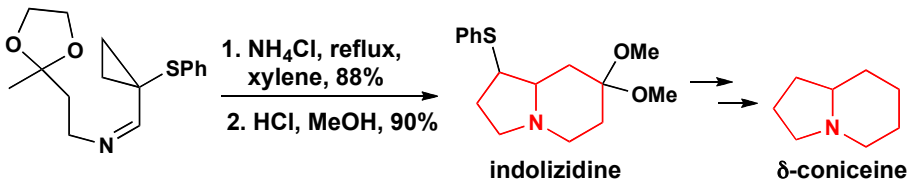
Alkaloids synthsis by rearrangement of cyclopropyl imines

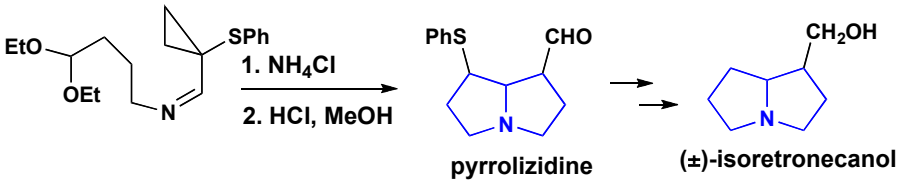


TL, 1967, 5158
TL, 1968



Synthesis of pyrrolizidine and indolizidine necleus **TL, 1976, 3799**





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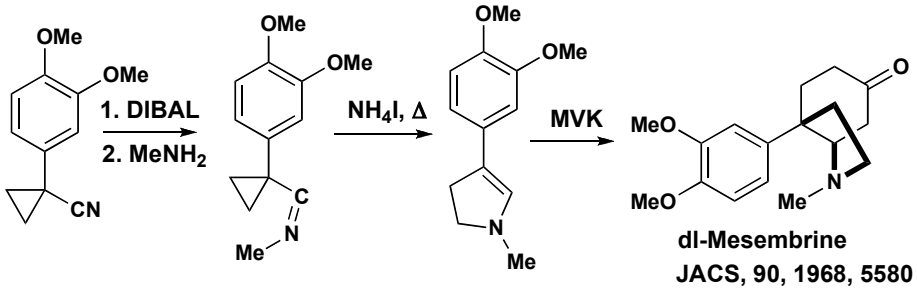
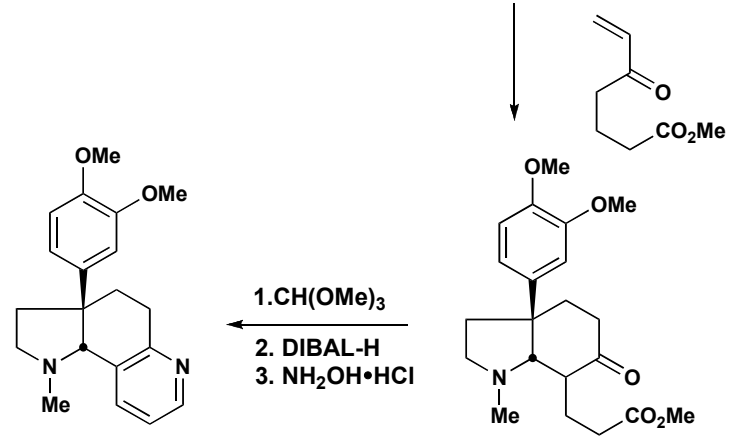
Applications to complex nature product



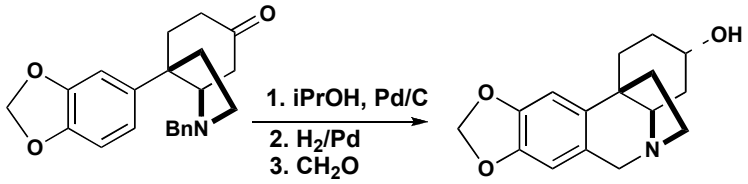
dl-Mesembrine

JACS, 90, 1968, 5580



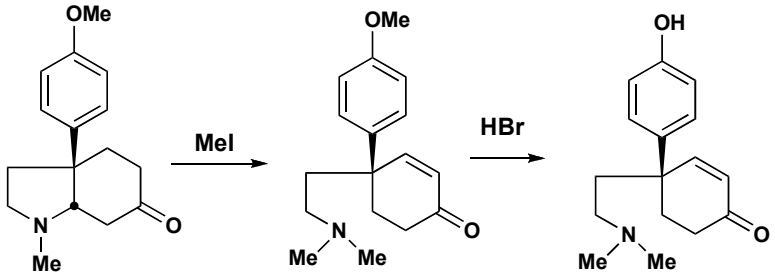
Sceletium A-4

JOC, 1975, 3495



dl-Elwesine

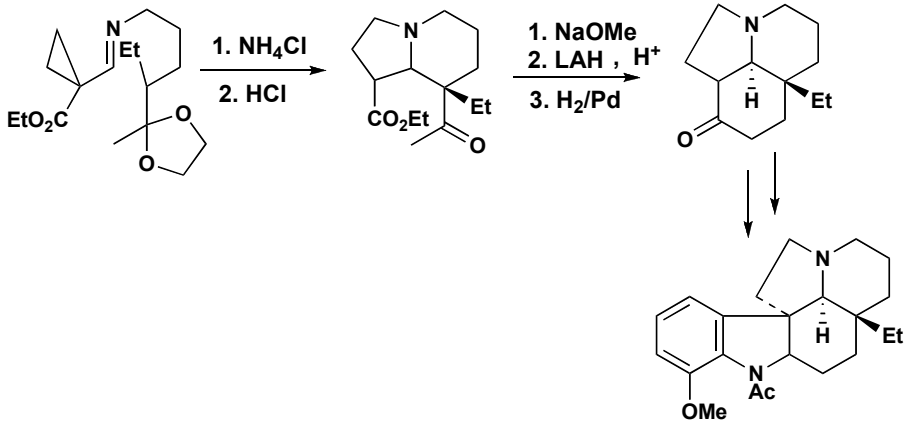
JOC, 1972, 977



(±)-Joubertiamine

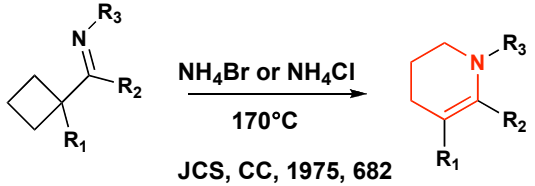
JOC, 1972, 2138

A formal synthesis of (±)-Aspidospermine



CC, 1971, 857 (±)-Aspidospermine

Acid catalysed rearrangement of cyclobutylimines synthesis of tetrahydropyridines



JCS, CC, 1975, 682 30%-66%

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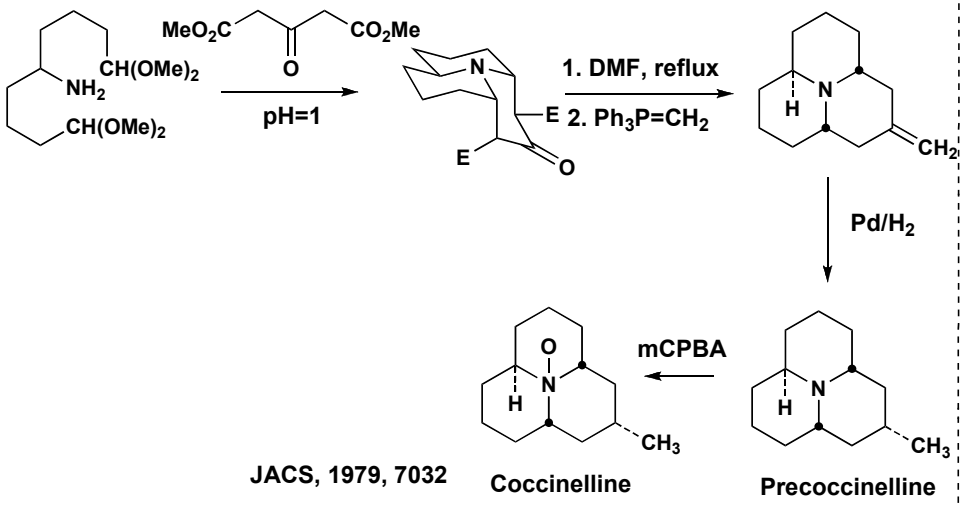
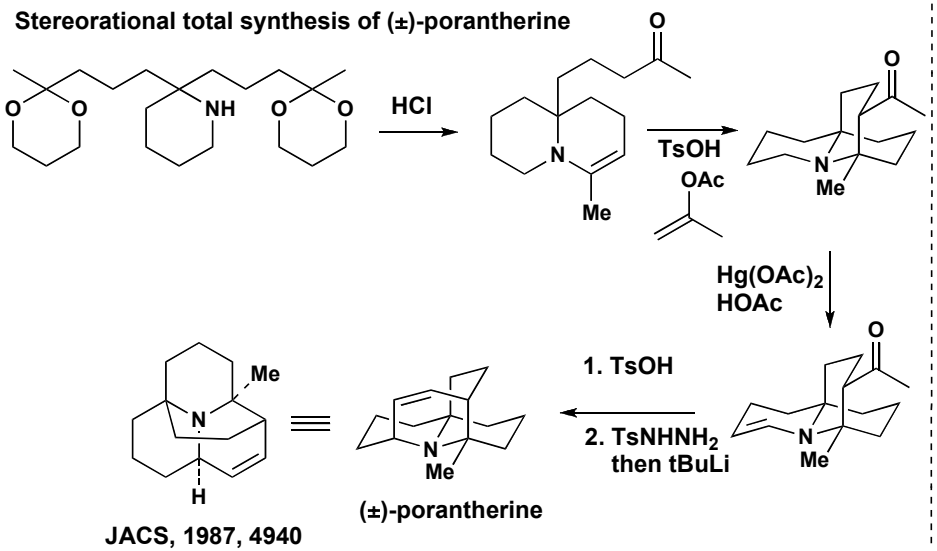
Total synthesis of precoccinelline and coccinelline with Robinson-Schopf reaction as the key step



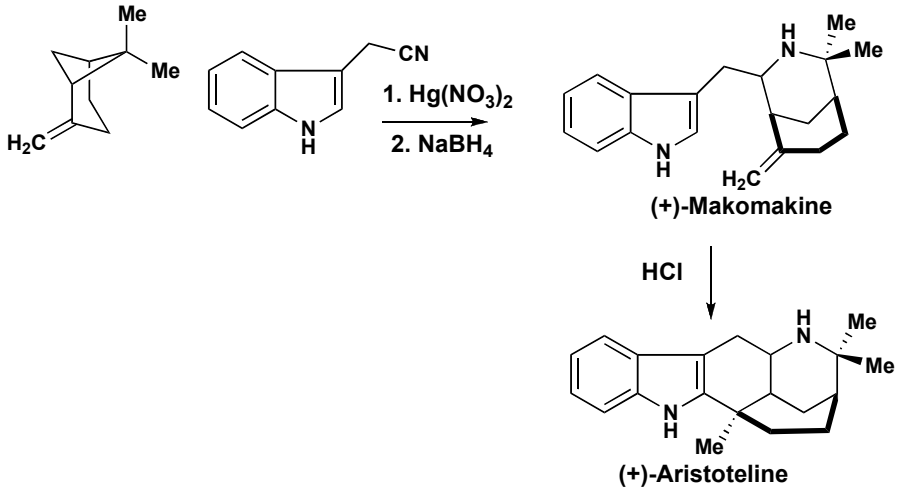
JACS, 1979, 7032

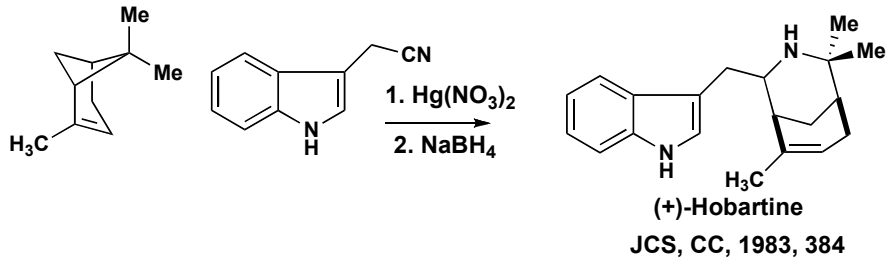
Stereorational total synthesis of (±)-porantherine



JACS, 1987, 4940

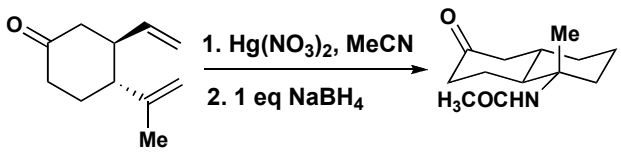
Expeditious stereospecific total syntheses of (+)-Makomakine, (+)-Aristoteline and (+)-Hobartine





JCS, CC, 1983, 384

Use of nitriles as terminatiors of carbacation-olefin cyclization



JOC, 1985, 632

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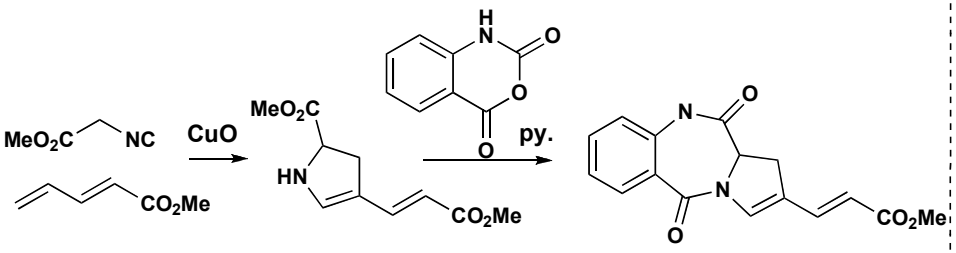
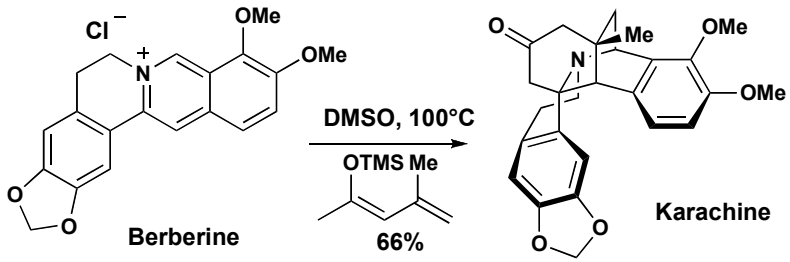
Synthesis of pyrrolobenzodiazepine nucleus of anthramycin



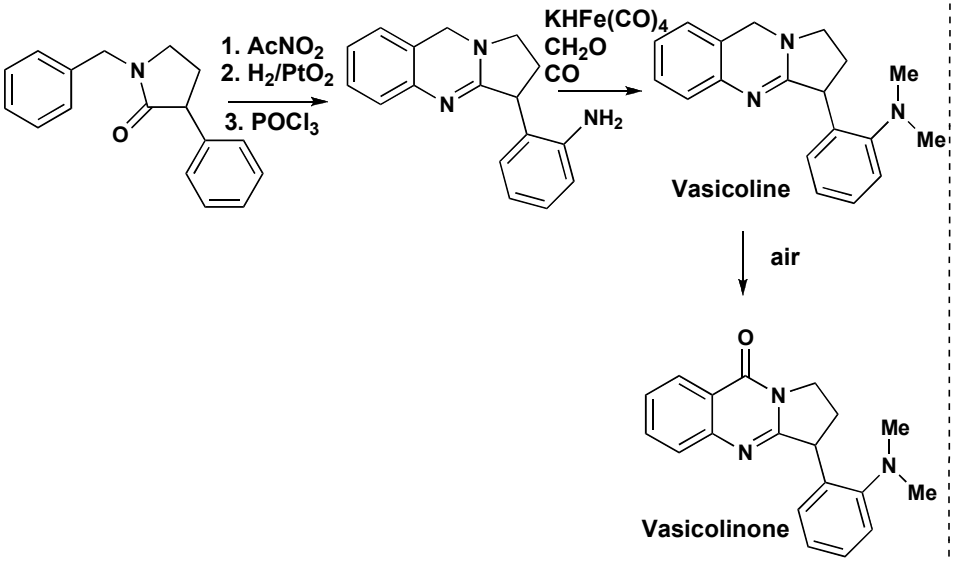
JCS, CC, 1975, 742

Expeditious total synthesis fo karachine



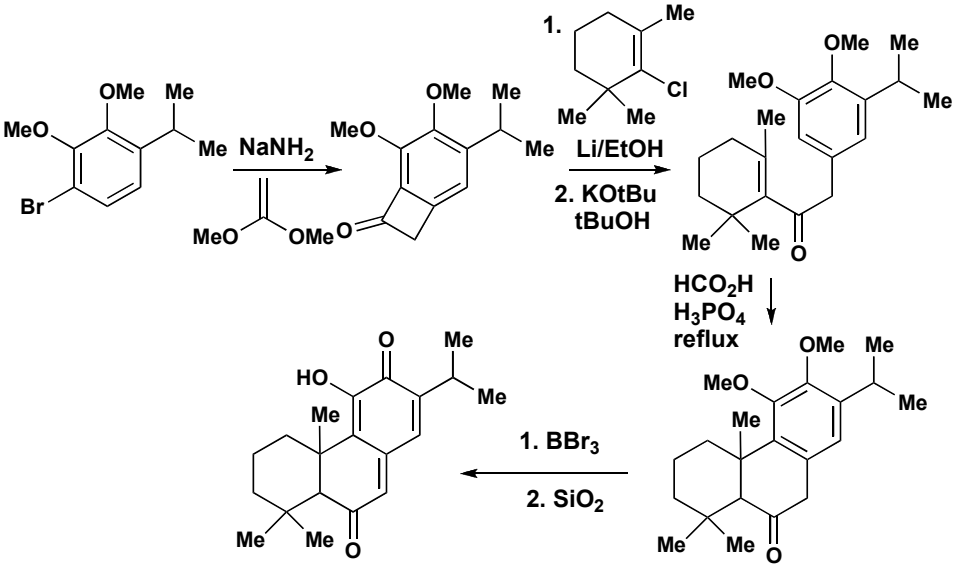
JCS, CC,1983, 1425

Total syntheses of vasicoline and vasicolinone



JOC, 1988, 1873

Studies on benzocyclobutenones and total synthesis of (±)-taxodione



(±)-taxodione

JOC, 1982, 2393
JOC, 1982, 2396

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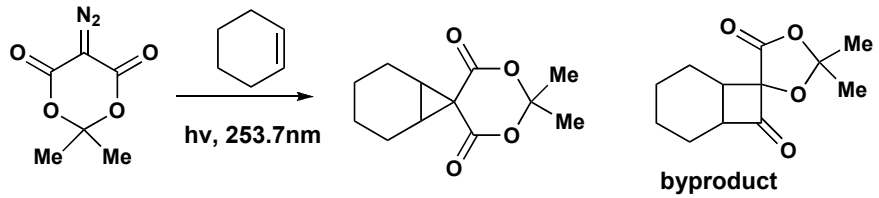
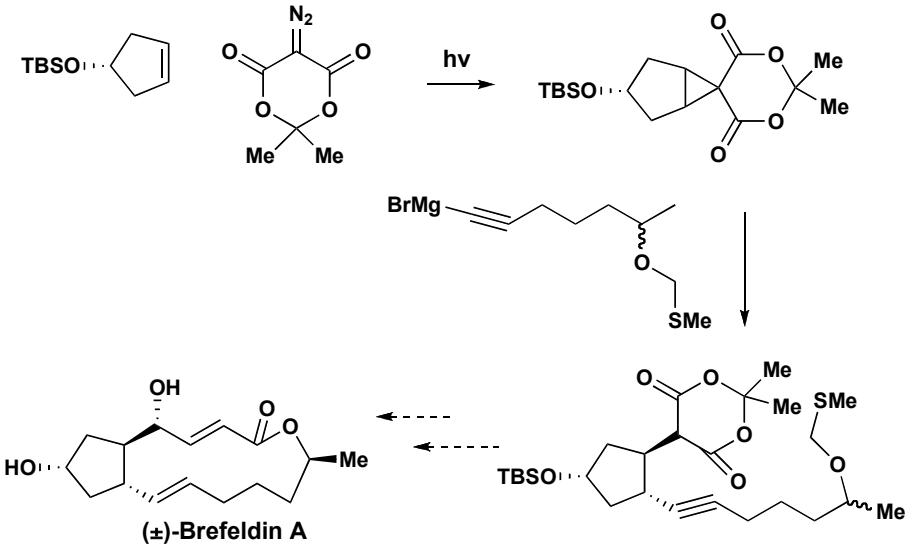
Studies on Spiro-Activated Cyclopropanes

1. synthesis of cyclopropane



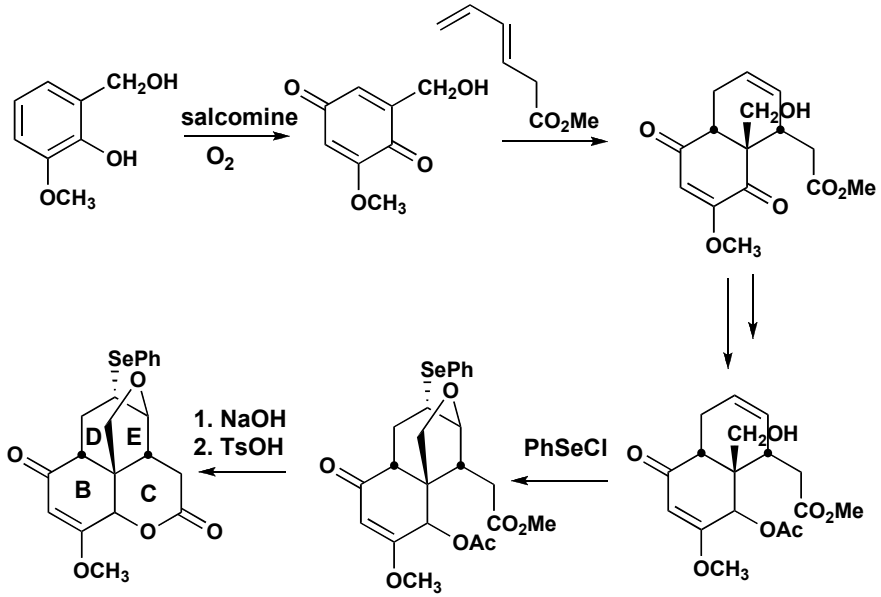
2. Homoconjugated addtion of Grignard

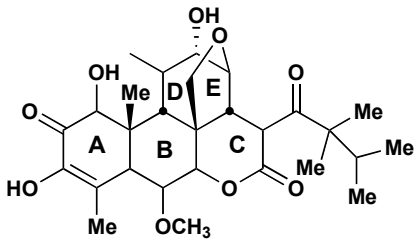


(±)-Brefeldin A

JCS, CC, 1978, 754
JACS, 1978, 6479
JOC, 1980, 2780

Studies on Quassinoids





Bruceantin

JOC, 1985, 4056
JOC, 1986, 4347

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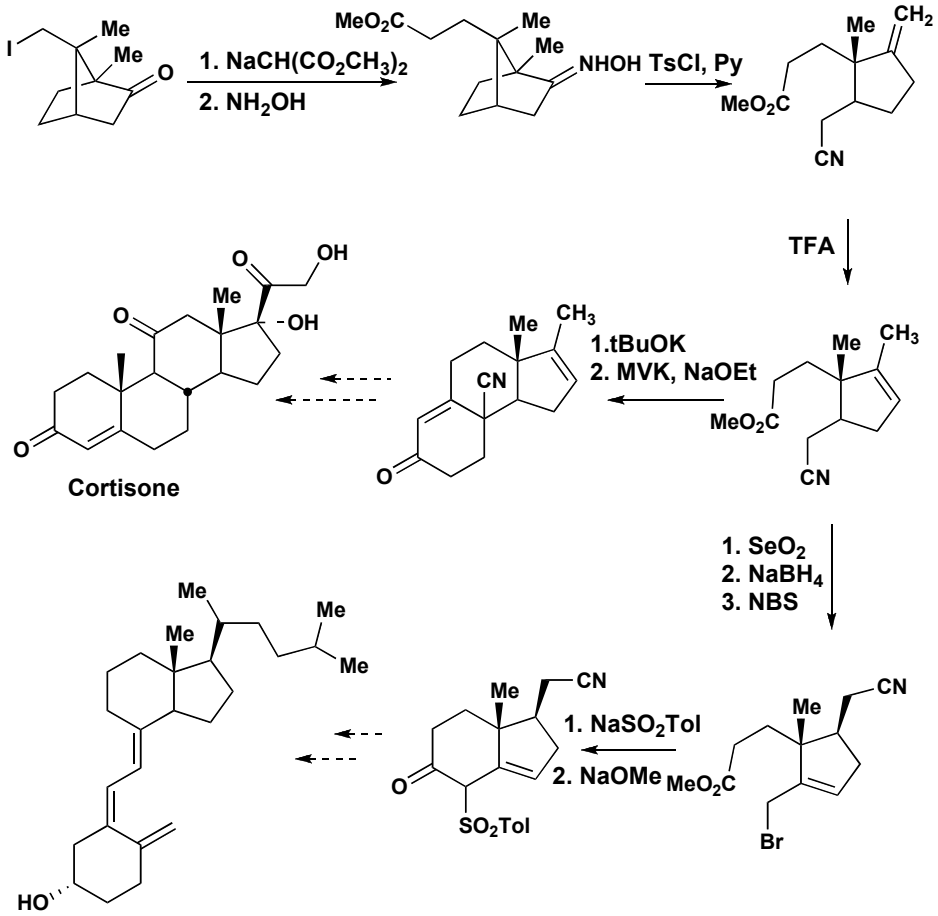
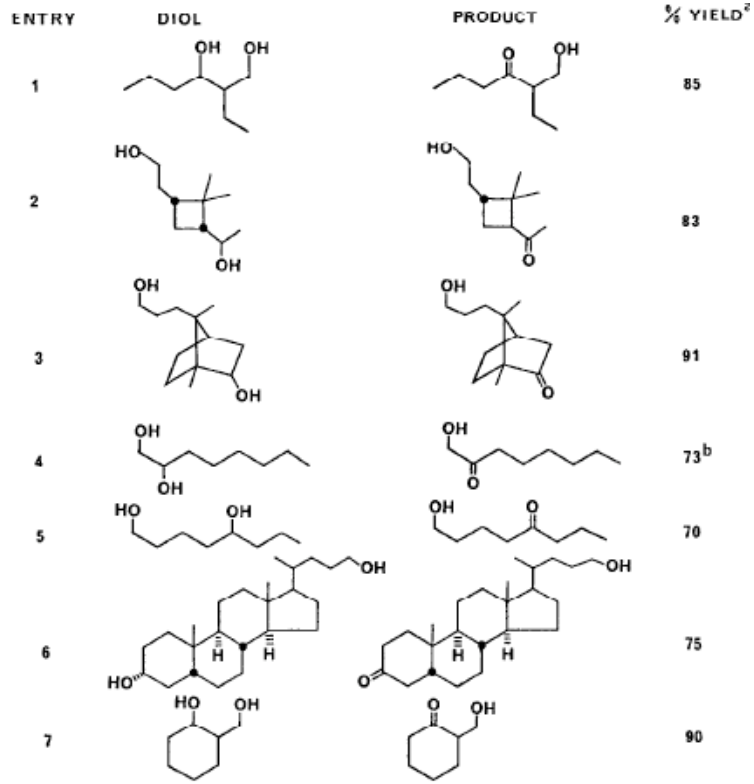
Total synthesis of steroids and vitamine D_3 using camphorae as chiral intermediate



JACS, 1977, 6105
JACS, 1983, 7713
T, 1985, 93

Studies on Sodium Hypochlorite "swimming pool chlorine"

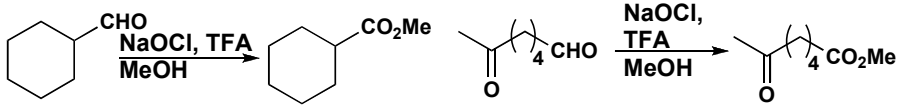
1. selective oxidation of secondary alcohol in the presence of primary alcohol



[a] All yields represent isolated pure products

[b] Isolated as the benzoate ester

2. conversion of aldehyde to ester



JOC, 1980, 2030, TL, 1982, 4647

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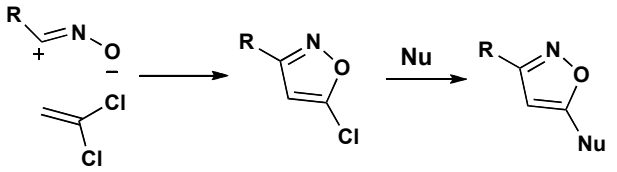
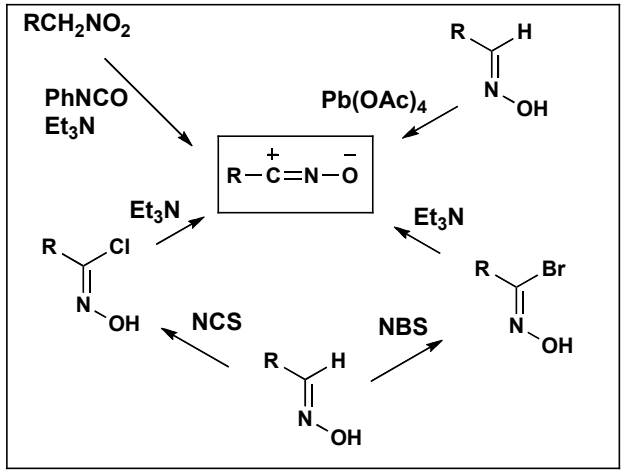
Isoxazole synthesis and nucleophilic substitutions of 5-choloroisoxazoles



General Method for the nitrile oxide



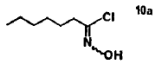
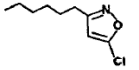
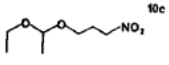
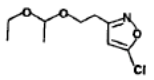
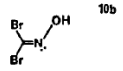
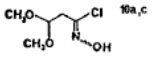
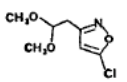
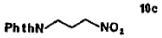
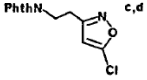
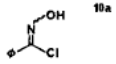
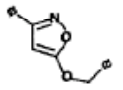
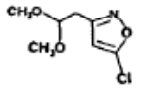
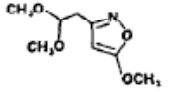
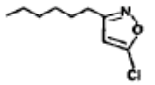
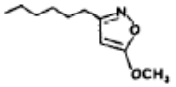
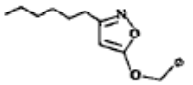
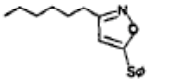
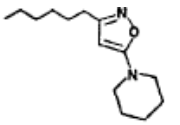
Nitrile oxide precursor	5-Chloroisoxazole	% Yield [b]	Nitrile oxide precursor	5-Chloroisoxazole	% Yield [b]
 10a		82	 10c		36
 10b		60	 10a,c		73
 10c	 c,d	30	 10a	e	78

Table II. Nucleophilic Substitution of 5-Chloroisoxazoles [a]

Substrate	Nucleophile, Conditions [c]	Product	% Yield [b]
	$NaOCH_2\phi$ 3h/60 °C		85
	$NaOCH_3$ 6 h/65 °C		70
	$NaOCH_3$ 18h/65 °C		88
"	$NaOCH_2\phi$ 5h/60 °C		72
"	ϕSLi 10 h/50 °C		48
"	LiN 24/25 °C		53

[a] All isoxazoles were fully characterized spectroscopically; [b] Yields represent chromatographically pure products; [c] The alkoxides were generated from the alcohol and sodium metal, thiophenol and piperidine were deprotonated with n-BuLi at 0°C.

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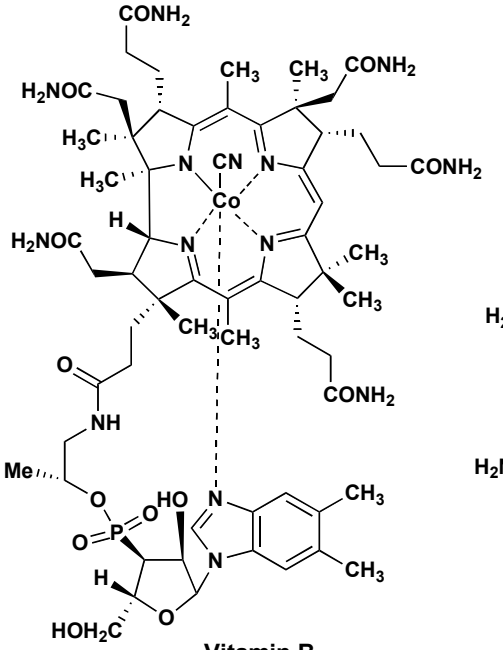
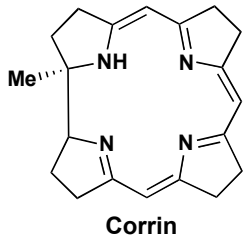
Studies on Vitamine B_{12} and Corrins



Vitamin B_{12}



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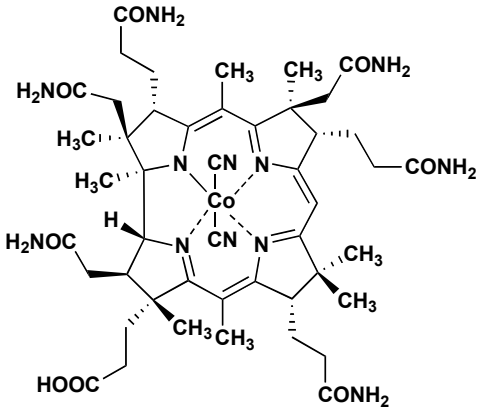
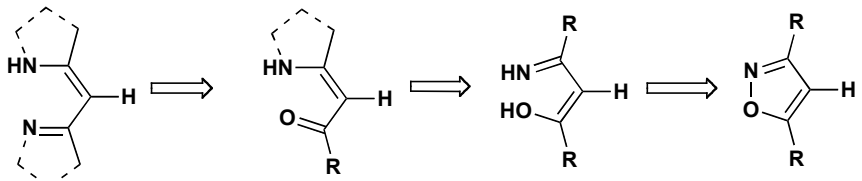
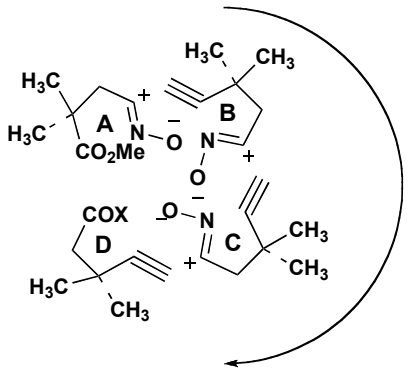


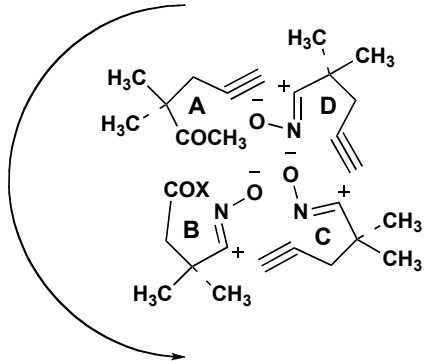
Cobyric Acid

Synthetic Strategy

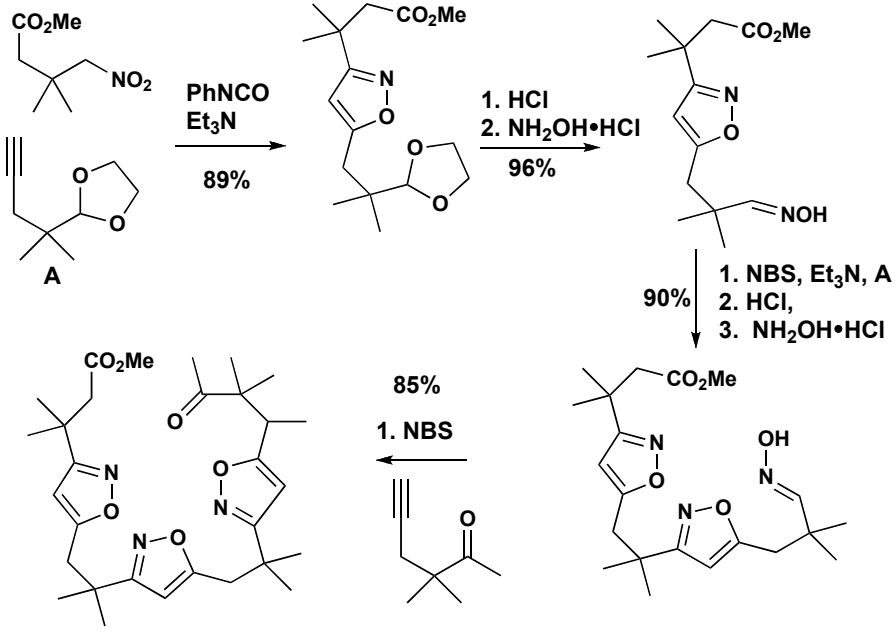


A B C D



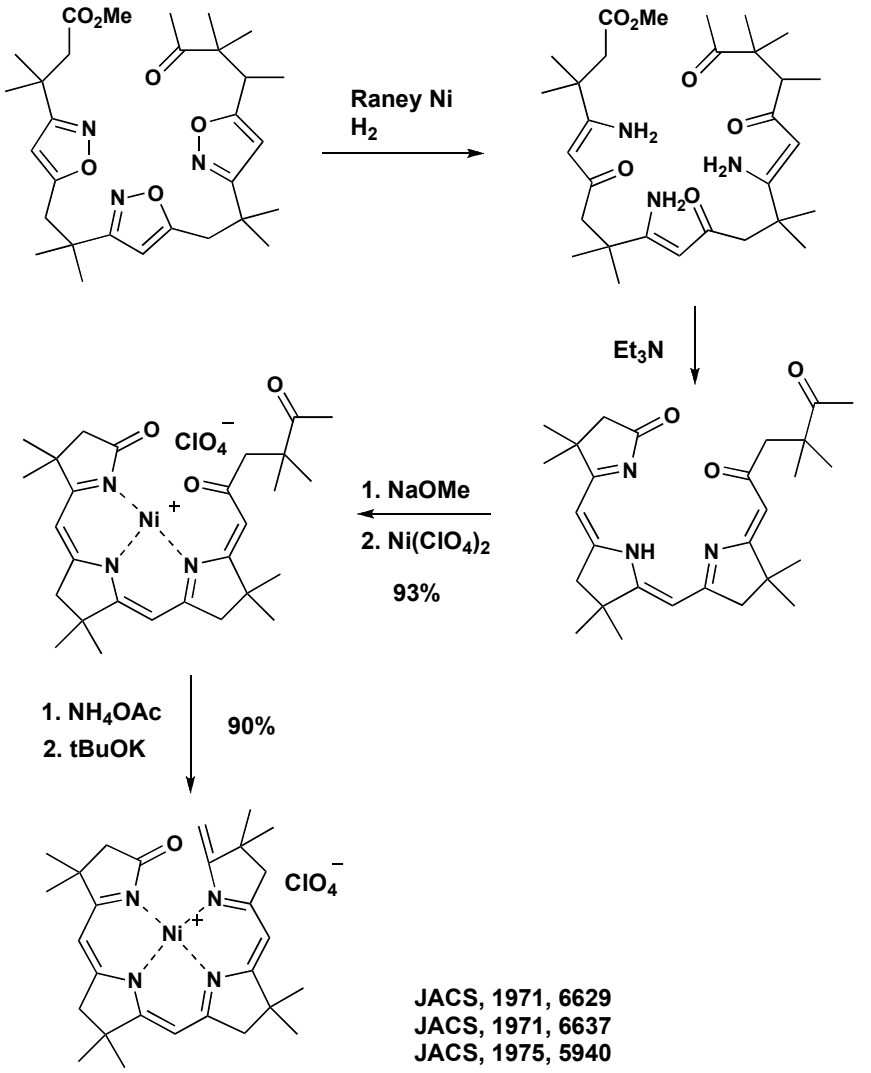


Total synthesis of Ni Octamethylcorphin



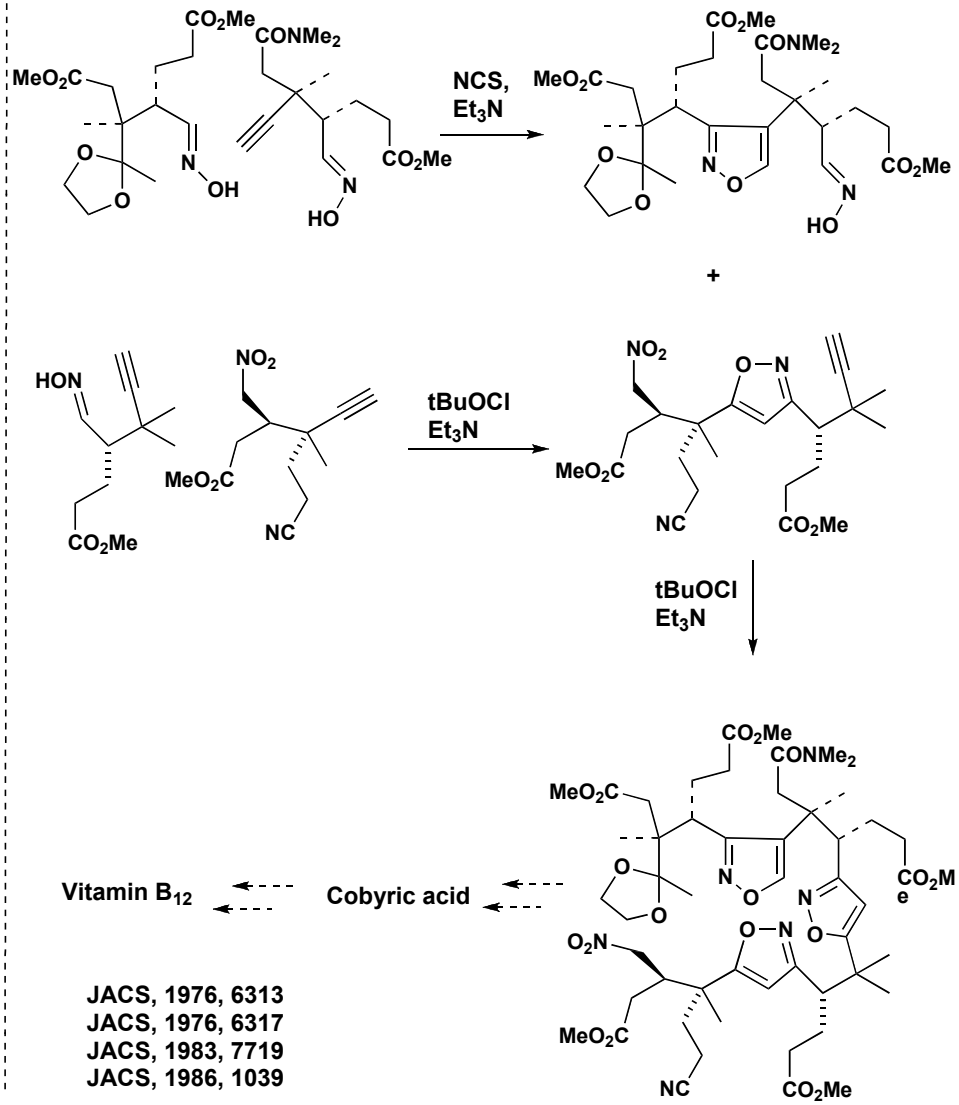
Robert V. Stevens

Jun Shi



JACS, 1971, 6629
JACS, 1971, 6637
JACS, 1975, 5940

Studies towards vitamin B_{12}



Vitamin B_{12} ← Cobyric acid

JACS, 1976, 6313
JACS, 1976, 6317
JACS, 1983, 7719
JACS, 1986, 1039