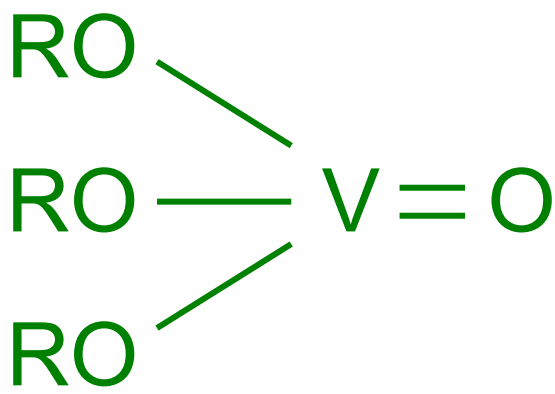
Vanadiumoxyalkoxide



Technical data

NICHIA CORPORATION

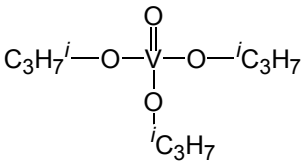
Vanadiumoxytriisopropoxide (Commercial product)

① Physical and Chemical Properties

Chemical Name: Vanadiumoxytriisopropoxide

CAS#. 5588-84-1

Structural Formula:



Molecular Formula: $C_9H_{21}O_4V$

Molecular Weight: 244.20

Appearance: Pale yellow liquid.

Boiling Point: 80～82 ℃/2 mmHg

Solubility: Freely soluble in almost organic solvents.

Stability: Air and moisture-sensitive.
Slowly decompose at high temperature.

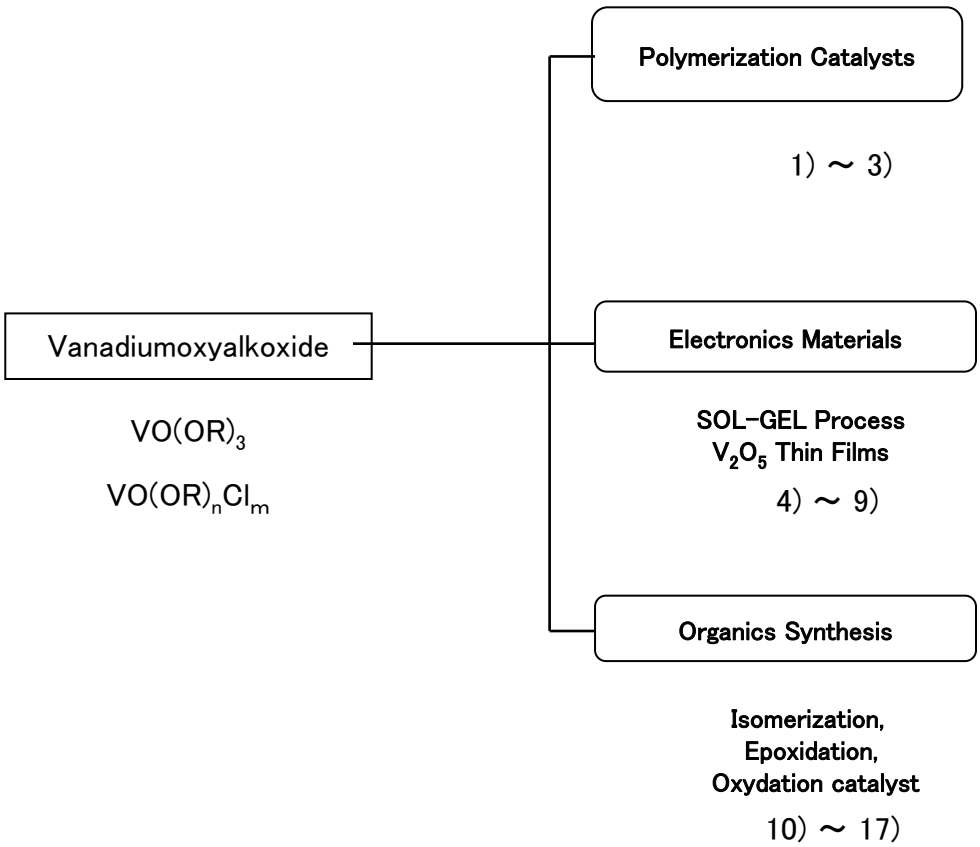
② Quality

		Specification	Typical data	Theoretical value
V^{5+}	:	≧ 20.50%	20.83%	20.86%
V^{3+}, V^{4+}	:	≦ 0.50%	0.21%	
Fe	:	≦ 0.01%	0.001%	

Vanadiumoxyalkoxide (Trial product)

Compositional Formula	Chemical name	CAS No	Physical State
$VO(OC_2H_5)_3$	Vanadium oxytriethoxide	1686-22-2	Orange-Yellow Liquid Vapour Pressure : 72 ℃(400 Pa)
$VO(OC_2H_5)Cl_2$	Vanadium oxyethoxide dichloride	1801-77-0	Pale Yellow Liquid Vapour Pressure : 63 ℃(600 Pa)
$VO(OC_2H_5)_2Cl$	Vanadium oxydiethoxide chloride	-	Orange-Yellow Liquid Vapour Pressure : 68 ℃(400 Pa)
$VO(O^nC_3H_7)_3$	Vanadium oxytri-n-propoxide	1686-23-3	Yellow Liquid Vapour Pressure : 72 ℃(20 Pa)
$VO(O^nC_4H_9)_3$	Vanadium oxytri-n-butoxide	1801-76-9	Yellow Liquid Vapour Pressure : 115 ℃(133 Pa)
$VO(O^iC_4H_9)_3$	Vanadium oxytri-i-butoxide	19120-62-8	Yellow Liquid Vapour Pressure : 80 ℃(40 Pa)
$VO(O^sC_4H_9)_3$	Vanadium oxytri-sec-butoxide	-	Yellow Liquid Vapour Pressure : 80 ℃(50 Pa)

1. Applications (Examples)

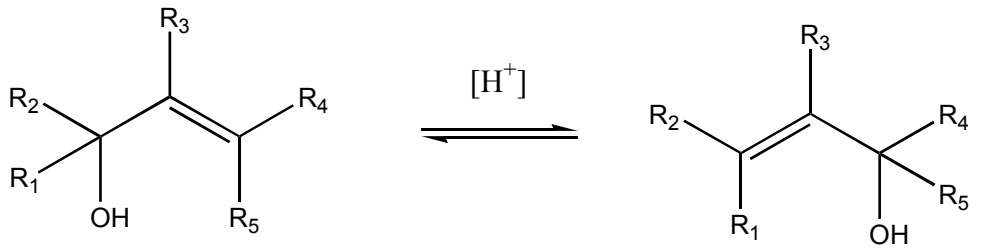


References of Applications

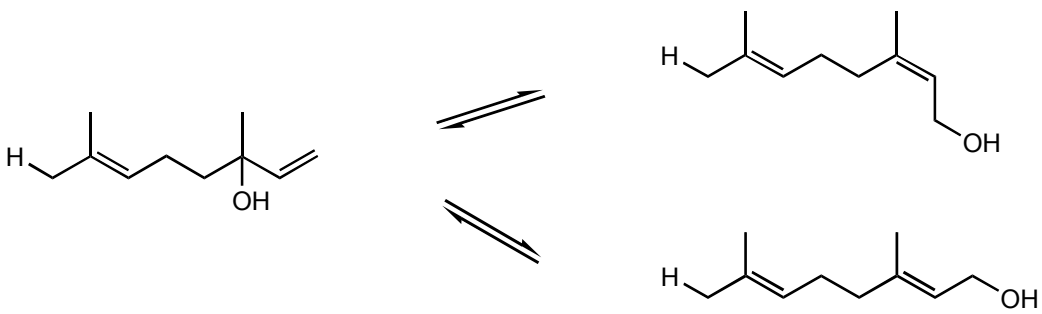
1) J. Polym. Sci., Macromol., (A) 3, 2047-2054 (1965)
2) J. Polym. Sci., Macromol. Rev., 10, 1 (1975)
3) Macromolecules, 4, 482 (1971)
4) Chemical Physics Letters, 445, 293 (2007)
5) Chem, Mater., 21, 1618 (2009)
6) J. Mater. Chem., 4, (10), 1581 (1994)
7) J. Mater. Chem., 6, (1), 49 (1996)
8) Chem, Mater., 5, (11), 1591 (1993)
9) J. Non-Crystalline Solids, 121, 68 (1990)
10) Tetrahedron, 57, 5073 (2001)
11) Chemistry Letters, 357 (1982)
12) JP S 51-48608
13) JP S 52-131506
14) USP 6566564 B1
15) J.Am.Chem.Soc.,95, 6136 (1973)
16) J.Am.Chem.Soc.,122, 10452 (2000)
17) JP S 61-236737

2. Application in Organic Synthesis

Isomerization



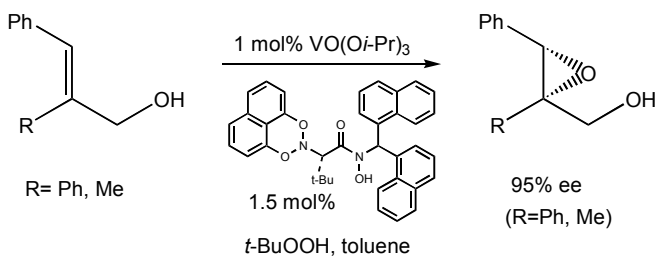
Tetrahedron, 33, 14, 1775 (1977)



cat. $VO(O^nBu)_3$: $54x10^{-3}$ mol%
200 °C , 2.5 hr
Conversion : 38%

Chemistry Letters, 357 (1982)

Epoxidation

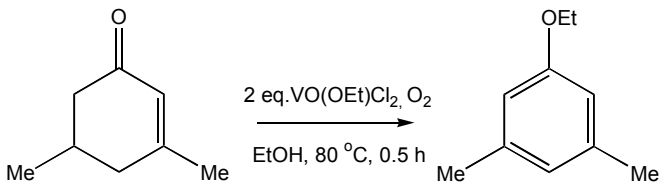


J. Am. Chem. Soc., 130, 5410 (2000)

J. Am. Chem. Soc., 122, 10452 (2000)

Oxidative transformation reaction of carbonyl compound

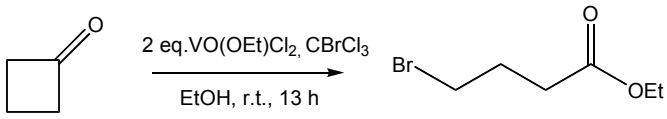
Dehydrogenation–oxidation



Yield: 91%

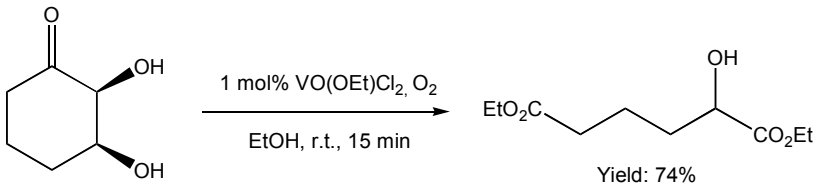
J. Org. Chem., 55, 358 (1990)

Oxidative cleavage



Yield: 60%

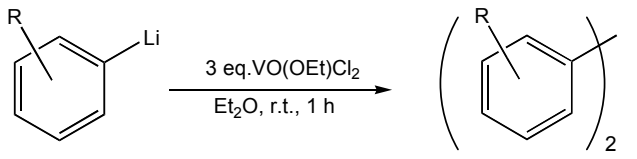
J. Org. Chem., 56, 2264 (1991)



Yield: 74%

J. Chem. Soc., Perkin Trans. 1, 7 (1998)

Oxidative coupling reaction

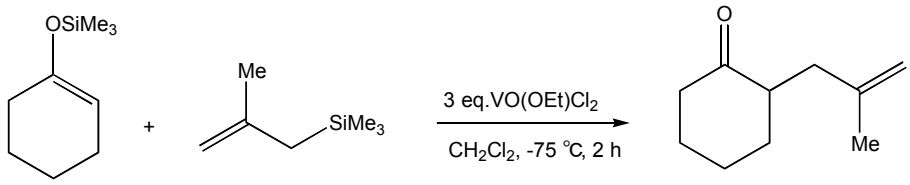


Yield: 90% (R=H)
90% (R=*o*-OMe)
91% (R=*p*-OMe)
80% (R=*o*-Ph)

Organometallics, 17, 5713 (1998)

Oxidative transformation reaction of organometallic compound

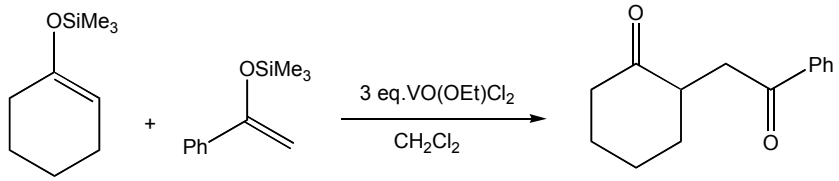
Formation of C–C bond



Yield: 65%

Tetrahedron, 50, 10207 (1994)

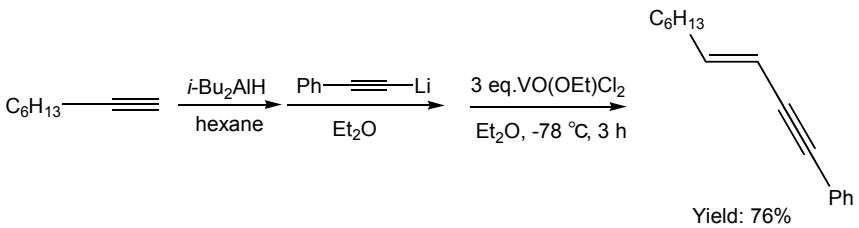
Synthesis of 1,4–diketone



Yield: 65%

Tetrahedron Lett., 33, 5823 (1992)

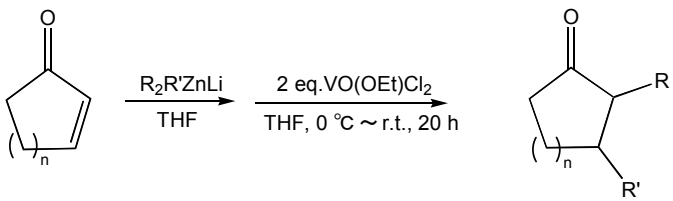
Synthesis of conjugated “Enyne”



Yield: 76%

J. Am. Chem. Soc., 120, 5124 (1998)

Vicinal dialkylation reaction



Yield: 72% (n=2, R=Me, R'=Me)
51% (n=2, R=Me, R'=Bu)
38% (n=1, R=Bu, R'=Bu)

Org. Lett., 2, 3659 (2000)

■ The contents of this brochure are updated as of March, 2010.

■ Reference

(The manufacturer & engineering department)
NICHIA CORPORATION TOKUSHIMA PLANT (V-PLANT)
224 Hiraishi Ebisuno, Kawauchi-Cho, Tokushima-Shi, TOKUSHIMA 771-0132, JAPAN
TEL: +81-88-665-2311
FAX: +81-88-665-5292

(Sales)
NICHIA CORPORATION TOKYO SALES OFFICE
13F Tamachi Center Building 34-7, Shiba 5-Chome, Minato-Ku, TOKYO 108-0014, JAPAN
TEL: +81-3-3456-3784
FAX: +81-3-3453-2369

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