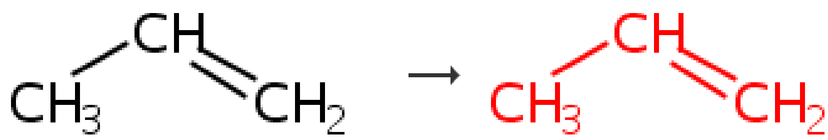
1. Single Step



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Overview

Steps/Stages

1.1 C:1847455-70-2, S:CH_2Cl_2, S:PhMe, 12 h, -20°C, 0.05 MPa

Notes

methylaluminoxane used, optimization study, optimized on time and temperature, low pressure, regioselective, Reactants: 1, Catalysts: 1, Solvents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

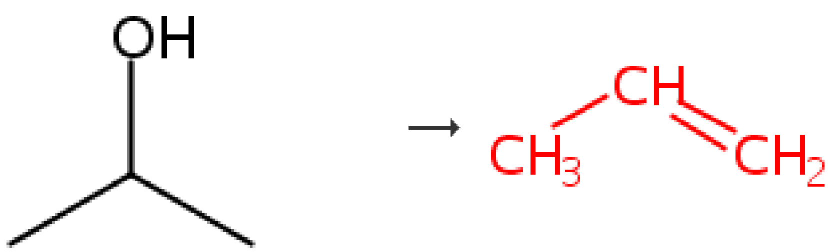
References

Regioselective Polymerizations of α-Olefins with an α-Diamine Nickel Catalyst

By Liao, Heng et al

From Chinese Journal of Polymer Science, 37(10), 959-965; 2019

2. Single Step



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Overview

Steps/Stages

1.1 C:13454-70-1, C:14808-79-8, 275°C

Notes

catalyst prepared and used, optimization study, optimized on stoichiometry of catalyst, solid-supported catalyst (Ce2(MoO4)3 supported on SiO2 gel used as catalyst), Reactants: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Synthesis, Characterization and Catalytic Activity of Nanocrystalline Ce2(MoO4)3/SiO2 as a Novel Catalyst for the Selective Production of Anhydrous Formaldehyde from Methanol

By Said, Abd El-Aziz A. and Goda, Mohamed N.

From Catalysis Letters, 149(2), 419-430; 2019

Reaction Protocol

Procedure

1. Carry out the dehydration of IPA in a conventional fixed-bed flow type reactor at atmospheric pressure using nitrogen as a carrier gas.
2. Perform a 500 mg catalyst, 2% reactant of IPA in the gas feed, 50 ml min^{-1} total flow rate and a 275 °C reaction temperature.

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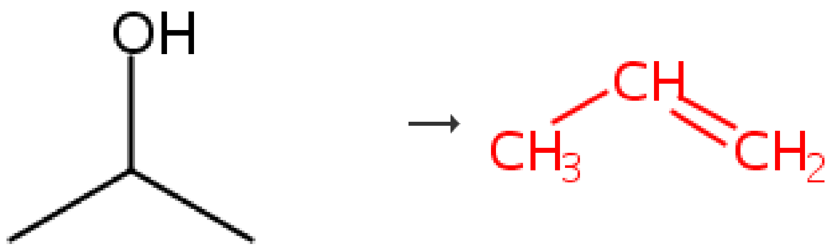
3. Single Step



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Overview

Steps/Stages

1.1 1008 h, 205°C, 0.1 MPa

Notes

zeolite ZSM-12 used as catalyst, conversion 99.6%, low pressure, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

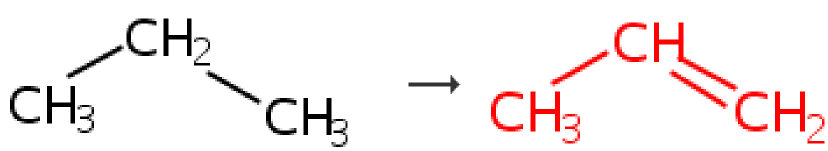
References

Process for producing olefins from alcohols by catalytic dehydration

By Fois, Giovanni Antonio and Buzzoni, Roberto

From PCT Int. Appl., 2019008499, 10 Jan 2019

4. Single Step



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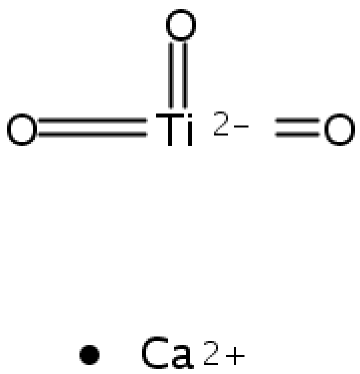
Overview

Steps/Stages

Notes

1.1 R:Pt, R:Cr, R:Al_2O_3

R:



R:

R:

550°C

selectivity, 10.6%, Reactants: 1, Reagents: 6, Steps: 1, Stages: 1, Most stages in any one step: 1

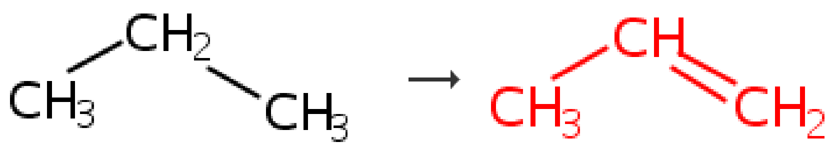
References

Catalytic alkane dehydrogenation

By Washburn, Seth M. et al

From U.S. Pat. Appl. Publ., 20160318828, 03 Nov 2016

5. Single Step



99%

Overview

Steps/Stages

1.1 R:H_2, C:Pt, C:Sn, C:Na, 50 h, 610°C, 0.1 MPa

Notes

mesoporous composite material supported catalyst prepared and used, optimization study, optimized on catalyst support, low pressure, solid-supported catalyst, Reactants: 1, Reagents: 1, Catalysts: 3, Steps: 1, Stages: 1, Most stages in any one step: 1

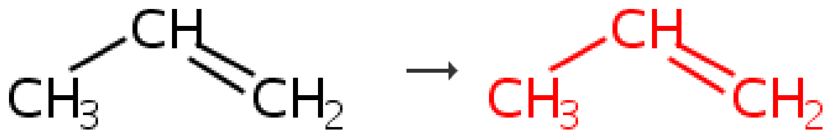
References

Supported catalyst and preparation method and application and method for preparing propylene by propane dehydrogenation

By Liu, Hongmei et al

From Faming Zhuanli Shenqing, 108786897, 13 Nov 2018

6. Single Step



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Overview

Steps/Stages

1.1 C:207728-92-5, S:PhMe, 40 min, 0°C, 1 atm

1.2 R:HCl, S:MeOH

Notes

alternative reaction conditions shown, optimization study, optimized on time, optimized on catalyst, incremental addition of propylene (stage 1), inverse addition (stage 2), solid-supported catalyst (silica supported trialkyl aluminum depleted modified methylaluminoxane catalyst prepared and used), Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

References

An Alternative Method for the Preparation of Trialkylaluminum-Depleted Modified Methylaluminoxane (dMMAO)

By Tanaka, Ryo et al

From Macromolecules (Washington, DC, United States), 50(15), 5989-5993; 2017

Reaction Protocol

Procedure

1. Charge dMMAO in toluene (Al content: 1.24 mol/L, 3.2 mL) to a 100 mL two-necked flask and dilute with toluene (20.8 mL).
2. Remove nitrogen in the head space of the flask and 224 mL (421 mg, 10 mmol) of propylene.

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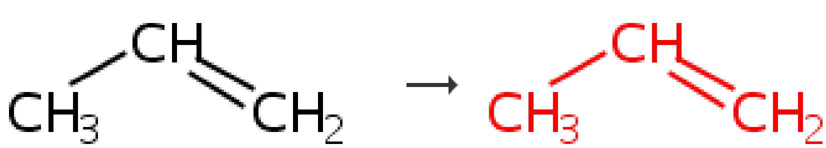
7. Single Step



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Overview

Steps/Stages

Notes

1.1 C:$MgCl_2$, C:(S)-Epichlorohydrin, C:PBu_3, S:PhMe, 2.5 h, rt → 50°C
1.2 C:81-84-5, 1 h, 50°C; 50°C → -25°C
1.3 C:$TiCl_4$, 1 h, -25°C; -25°C → 80°C
1.4 C:1939847-85-4, 1 h, 80°C
1.5 C:$TiCl_4$, S:PhMe, 2 h, 80°C → 110°C
1.6 R:H_2, C:$AlEt_3$, C:17865-32-6, 1 h, 70°C

autoclave used, catalyst prepared and used, Reactants: 1, Reagents: 1, Catalysts: 8, Solvents: 1, Steps: 1, Stages: 6, Most stages in any one step: 6

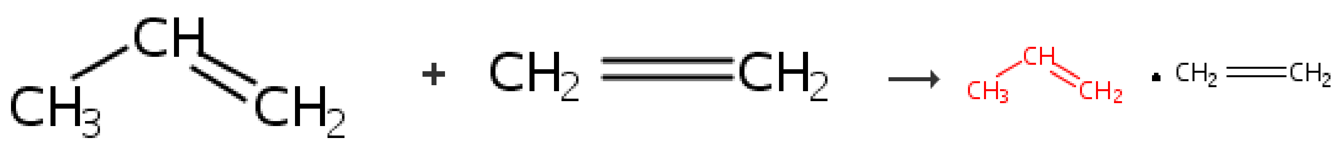
References

Solid catalyst component for olefin polymerization, catalyst, and application thereof

By Hu, Jianjun et al

From Faming Zhuanli Shenqing, 105622797, 01 Jun 2016

8. Single Step



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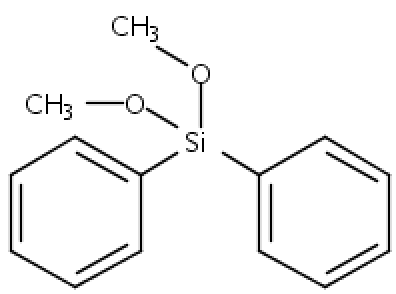
Overview

Steps/Stages

1.1 R:



R:H_2, C:Montmorillonite, C:$AlEt_3$, S:$Me(CH_2)_5Me$, 10 min
1.2 30 min

Notes

alternative reaction conditions shown, Reactants: 2, Reagents: 2, Catalysts: 2, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

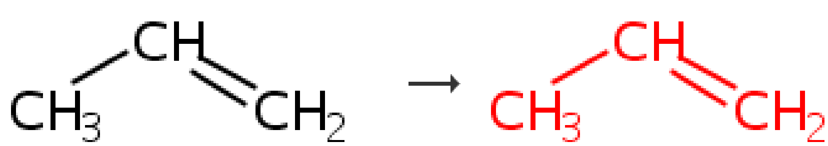
References

Montmorillonite-Reinforced impact polypropylene copolymer resins

By Qin, Yawei et al

From Shiyou Huagong, 43(7), 748-753; 2014

9. Single Step



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Overview

Steps/Stages

Notes

1.1 C:1808939-90-3, C:118612-00-3, C:1070-00-4, S:107-83-5, S:PhMe, 41 s, 70°C, 120 psi

1.2 R:O_2

glass vial used, optimization study, optimized on catalyst, optimized on time, optimized on temperature, optimized on pressure, catalyst prepared and used, aerobic (stage 2), Reactants: 1, Reagents: 1, Catalysts: 3, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

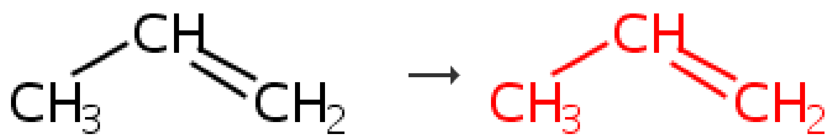
References

Pyridyldiamido transition metal complexes, production and use thereof

By Hagadorn, John R. and Palafox, Patrick J.

From PCT Int. Appl., 2015134213, 11 Sep 2015

10. Single Step



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Overview

Steps/Stages

1.1 C:1807889-93-5, C:118612-00-3, C:1070-00-4, S:107-83-5, S:PhMe, 46 s, 70°C, 120 psi

1.2 R:O_2

Notes

glass vial used, optimization study, optimized on catalyst, optimized on time, optimized on temperature, optimized on pressure, catalyst prepared and used, aerobic (stage 2), Reactants: 1, Reagents: 1, Catalysts: 3, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

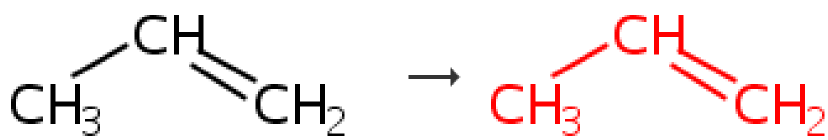
References

Pyridyldiamido transition metal complexes, production and use thereof

By Hagadorn, John R. and Palafox, Patrick J.

From PCT Int. Appl., 2015134213, 11 Sep 2015

11. Single Step



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Overview

Steps/Stages

Notes

1.1 C:1807889-95-7, C:118612-00-3, C:1070-00-4, S:107-83-5, S:PhMe, 52 s, 70°C, 120 psi

1.2 R:O_2

glass vial used, optimization study, optimized on catalyst, optimized on time, optimized on temperature, optimized on pressure, catalyst prepared and used, aerobic (stage 2), Reactants: 1, Reagents: 1, Catalysts: 3, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

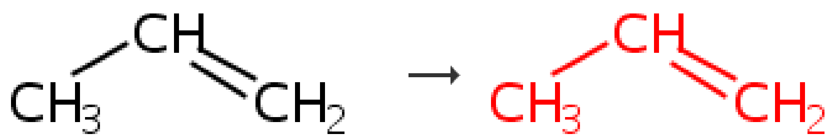
References

Pyridyldiamido transition metal complexes, production and use thereof

By Hagadorn, John R. and Palafox, Patrick J.

From PCT Int. Appl., 2015134213, 11 Sep 2015

12. Single Step



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Overview

Steps/Stages

1.1 C:133445-49-5, rt

Notes

alternative preparation shown, Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

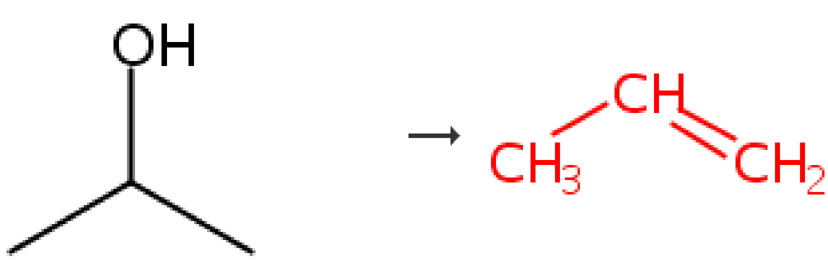
References

Observation of zirconium allyl species formed during zirconocene-catalyzed propene polymerization and mechanistic insights

By Vatamanu, Mihaela

From Journal of Catalysis, 323, 112-120; 2015

13. Single Step



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Overview

Steps/Stages

Notes

1.1 C:13778-59-1, 300°C

catalyst prepared and used, fixed-bed down-flow reactor used, Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

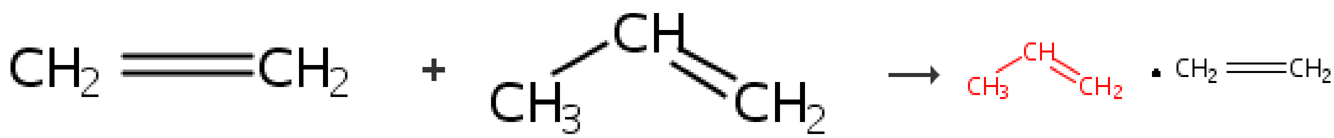
References

Synthesis, characterization and study of lanthanum phosphates as light alcohols dehydration catalysts

By Nguyen, T. T. N. et al

From Applied Catalysis, B: Environmental, 166-167, 432-444; 2015

14. Single Step



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Overview

Steps/Stages

1.1 C:BHT, S:PhMe, 30 min, rt
1.2 C:182166-91-2, S:PhMe, 30 min, 0°C

Notes

polymer with various molecular weight prepared, optimization study in stage 1, modified methylaluminoxane used in stage 1, optimized on catalyst and its ratio in stage 1, Reactants: 2, Catalysts: 2, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Ethylene-propylene copolymerization behavior of ansa-dimethylsilylene(fluorenyl)(amido)dimethyltitanium complex: Application to ethylene-propylene-diene or ethylene-propylene-norbornene terpolymers

By Tanaka, Ryo et al

From Journal of Polymer Science, Part A: Polymer Chemistry, 53(5), 685-691; 2015

Reaction Protocol

Procedure 1. Charge MMAO (6.5 wt % Al in toluene, 1.84 mL, 4.0 mmol), BHT (0.5 M in toluene, 0.60 mL, 0.30 mmol) and toluene (26.6 mL) under nitrogen to a 100 mL two-necked flask.
2. Stir the mixture for 30 minutes at room temperature.

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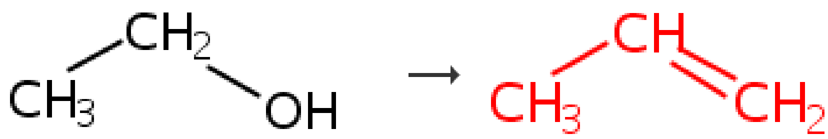
15. Single Step



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Overview

Steps/Stages

1.1 4.5 h, 500°C, 0.12 atm

Notes

green chemistry, thermal, solid-supported catalyst, HZSM-5and HMCM-22 zeolite used, other products also detected, no experimental detail, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

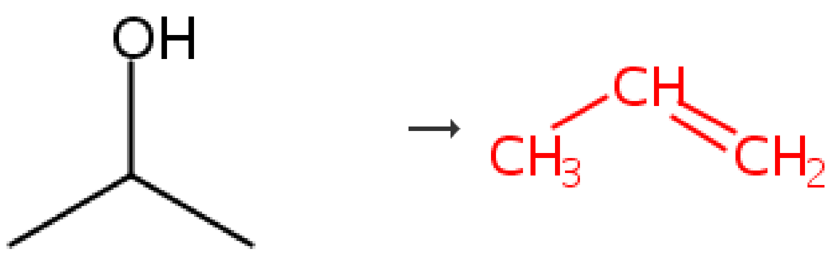
References

Bioethanol conversion into hydrocarbons on HZSM-5 and HMCM-22 zeolites: Use of in situ DRIFTS to elucidate the role of the acidity and of the pore structure over the coke formation and product distribution

By Sousa, Zilacleide S. B. et al

From Catalysis Today, 234, 182-191; 2014

16. Single Step



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Overview

Steps/Stages

Notes

1.1 R:H_2, 200°C

gas phase, continuous flow reactor used, H-beta zeolite catalyst used, space time (W/F) dependent product formation, Reactants: 1, Reagents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

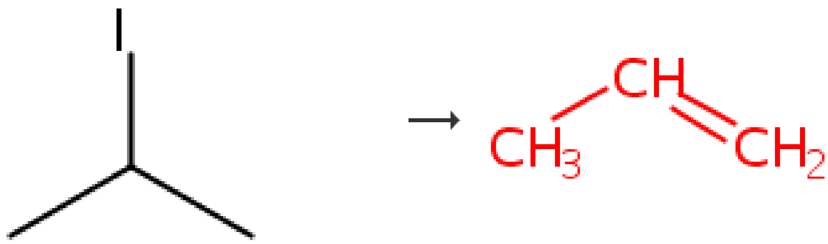
References

Improving carbon retention in biomass conversion by alkylation of phenolics with small oxygenates

By Nie, Lei and Resasco, Daniel E.

From Applied Catalysis, A: General, 447-448, 14-21; 2012

17. Single Step



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Overview

Steps/Stages

1.1 3 h, 200°C

Notes

thermal, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

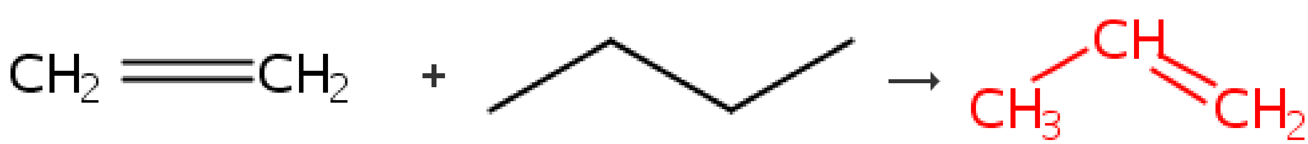
References

Hydroiodic acid catalyzed selective transformation of biomass

By Yang, Weiran et al

From Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry, 57(1), 119-120; 2012

18. Single Step



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Overview

Steps/Stages

Notes

1.1 C:Mo, 45°C, 5 bar

alumina supported catalyst prepared and used, solid-supported catalyst, Reactants: 2, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

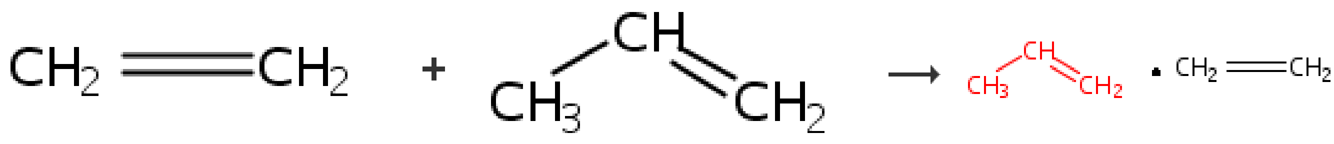
References

Process of propylene synthesis from ethylene by dimerization and metathesis

By Touchais, Natacha et al

From Fr. Demande, 3071832, 05 Apr 2019

19. Single Step



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Overview

Steps/Stages

1.1 R:Et_3N, R:HCl, C:*p*-$MeC_6H_4SO_3H$, C:92390-26-6, C:92361-49-4, C:4162-45-2, S:PhMe, S:EtOH, rt → 60°C, 3 MPa; 80 min, 60°C

Notes

methylaluminoxane used, high pressure, Reactants: 2, Reagents: 2, Catalysts: 4, Solvents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

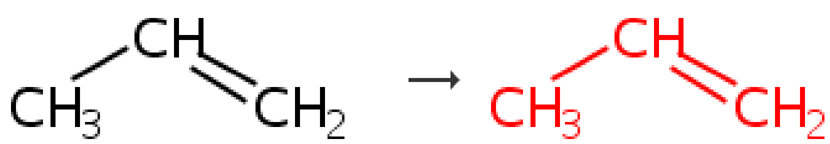
References

Method for preparing polar ethylene propylene rubber using olefin polymerization catalyst

By Wang, Qiyu and Wang, Xin

From Faming Zhuanli Shenqing, 108976323, 11 Dec 2018

20. Single Step



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Overview

Steps/Stages

Notes

1.1 C:4403-68-3, C:Et_3N, 1 h, 70°C

optimization study, optimized on catalysts, Reactants: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

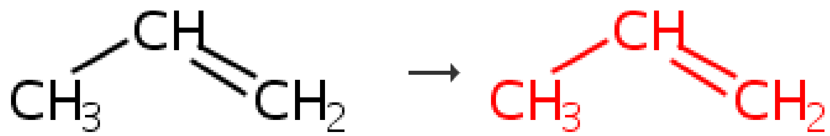
References

Propylene polymerization using TiCln(OR)(4-n) catalysts: Theoretical analysis and experimental investigation

By Xie, Kefeng et al

From Journal of Organometallic Chemistry, 872, 144-152; 2018

21. Single Step



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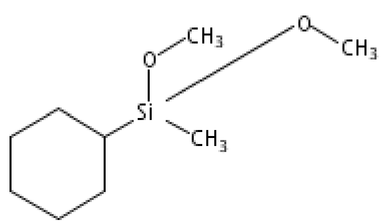
Overview

Steps/Stages

1.1 R:$AlEt_3$

R:



R:H_2, C:$MgCl_2$, C:Epichlorohydrin, C:126-73-8, C:Phthalic anhydride, rt → 70°C; 1 h, 70°C

Notes

stainless steel autoclave used, catalyst prepared and used, Reactants: 1, Reagents: 3, Catalysts: 4, Steps: 1, Stages: 1, Most stages in any one step: 1

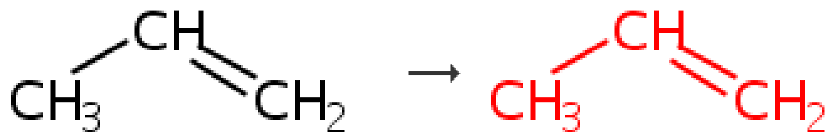
References

Method for preparing compound coupled with fluorene group and carboxylate

By Hu, Jianjun et al

From Faming Zhuanli Shenqing, 105622416, 01 Jun 2016

22. Single Step



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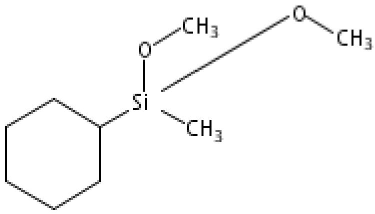
Overview

Steps/Stages

Notes

1.1 C:$MgCl_2$, C:Epichlorohydrin, C:126-73-8, S:PhMe, rt → 50°C; 2.5 h, 50°C
1.2 C:Phthalic anhydride, 1 h, 50°C; 50°C → -25°C
1.3 C:$TiCl_4$, 1 h, -25°C; -25°C → 80°C
1.4 C:129228-11-1, 1 h, 80°C
1.5 C:210882-24-9, S:$Me(CH_2)_4Me$, 30 min, 110°C

1.6 R:



R:H_2, C:$AlEt_3$, rt → 70°C; 1 h, 70°C

stainless steel autoclave used, optimization study, optimized on catalyst, thermal (stage 5), Reactants: 1, Reagents: 2, Catalysts: 8, Solvents: 2, Steps: 1, Stages: 6, Most stages in any one step: 6

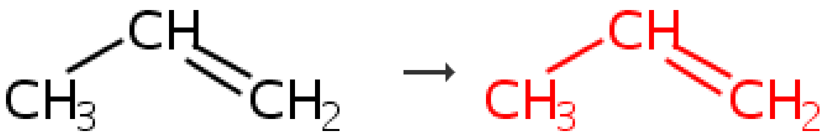
References

Catalyst component and stable and highly active Ziegler-Natta catalyst for olefin polymerization

By Wang, Jun et al

From Faming Zhuanli Shenqing, 105085729, 25 Nov 2015

23. Single Step



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Overview

Steps/Stages

1.1 C:$MgCl_2$, C:(S)-Epichlorohydrin, C:PBu_3, S:PhMe, 2.5 h, rt → 50°C
1.2 C:81-84-5, 1 h, 50°C; 50°C → -25°C
1.3 C:$TiCl_4$, 1 h, -25°C; -25°C → 80°C
1.4 C:1939847-97-8, 1 h, 80°C
1.5 C:$TiCl_4$, S:PhMe, 2 h, 80°C → 110°C

1.6 R:H_2, C:$AlEt_3$, C:17865-32-6, 1 h, 70°C

Notes

autoclave used, catalyst prepared and used, Reactants: 1, Reagents: 1, Catalysts: 8, Solvents: 1, Steps: 1, Stages: 6, Most stages in any one step: 6

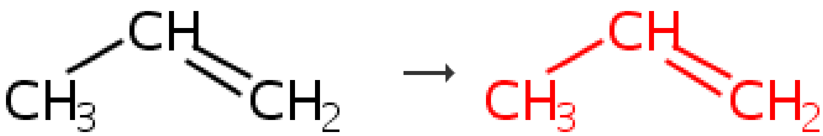
References

Solid catalyst component for olefin polymerization, catalyst, and application thereof

By Hu, Jianjun et al

From Faming Zhuanli Shenqing, 105622797, 01 Jun 2016

24. Single Step



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Overview

Steps/Stages

Notes

1.1 C:$MgCl_2$, C:(S)-Epichlorohydrin, C:PBu_3, S:PhMe, 2.5 h, rt → 50°C
1.2 C:81-84-5, 1 h, 50°C; 50°C → -25°C
1.3 C:$TiCl_4$, 1 h, -25°C; -25°C → 80°C
1.4 C:1939847-91-2, 1 h, 80°C
1.5 C:$TiCl_4$, S:PhMe, 2 h, 80°C → 110°C

1.6 R:H_2, C:$AlEt_3$, C:17865-32-6, 1 h, 70°C

autoclave used, catalyst prepared and used, Reactants: 1, Reagents: 1, Catalysts: 8, Solvents: 1, Steps: 1, Stages: 6, Most stages in any one step: 6

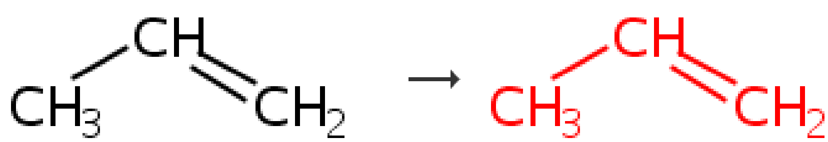
References

Solid catalyst component for olefin polymerization, catalyst, and application thereof

By Hu, Jianjun et al

From Faming Zhuanli Shenqing, 105622797, 01 Jun 2016

25. Single Step



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Overview

Steps/Stages

1.1 C:$MgCl_2$, C:(S)-Epichlorohydrin, C:PBu_3, S:PhMe, 2.5 h, rt → 50°C
1.2 C:81-84-5, 1 h, 50°C; 50°C → -25°C
1.3 C:$TiCl_4$, 1 h, -25°C; -25°C → 80°C
1.4 C:1939847-79-6, 1 h, 80°C
1.5 C:$TiCl_4$, S:PhMe, 2 h, 80°C → 110°C

1.6 R:H_2, C:$AlEt_3$, C:17865-32-6, 1 h, 70°C

Notes

autoclave used, catalyst prepared and used, Reactants: 1, Reagents: 1, Catalysts: 8, Solvents: 1, Steps: 1, Stages: 6, Most stages in any one step: 6

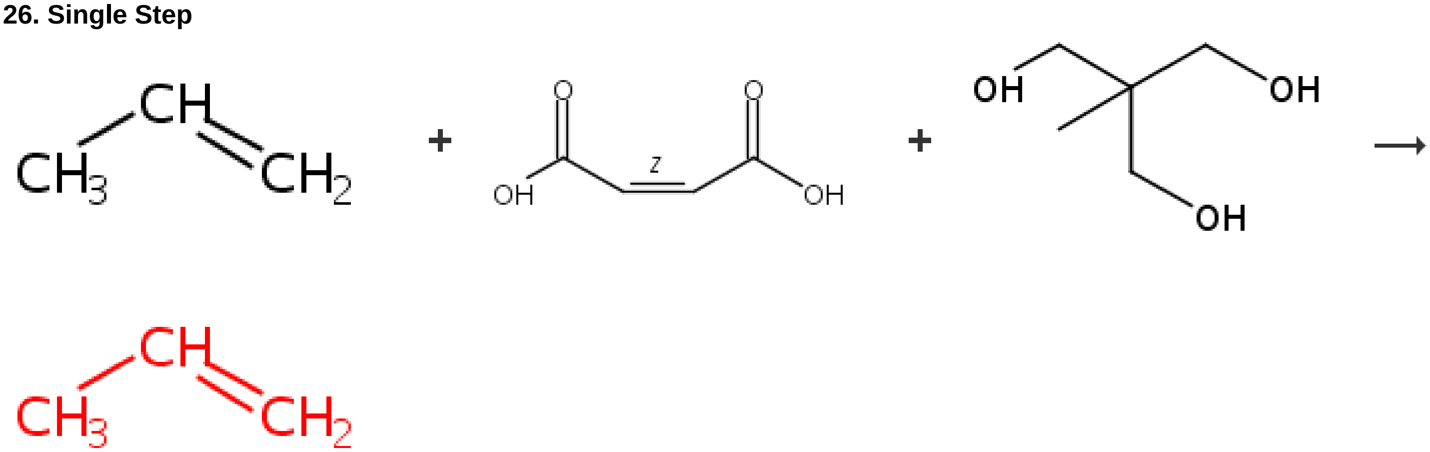
References

Solid catalyst component for olefin polymerization, catalyst, and application thereof

By Hu, Jianjun et al

From Faming Zhuanli Shenqing, 105622797, 01 Jun 2016

26. Single Step



maleated, ester with trimethylolethane, re

96%

Overview

Steps/Stages

1.1 rt → 240°C; 3 h, 240°C
1.2 4 h, 160°C

1.3 R:N_2H_4, 1 h, 90°C

Notes

Reactants: 3, Reagents: 1, Steps: 1, Stages: 3, Most stages in any one step: 3

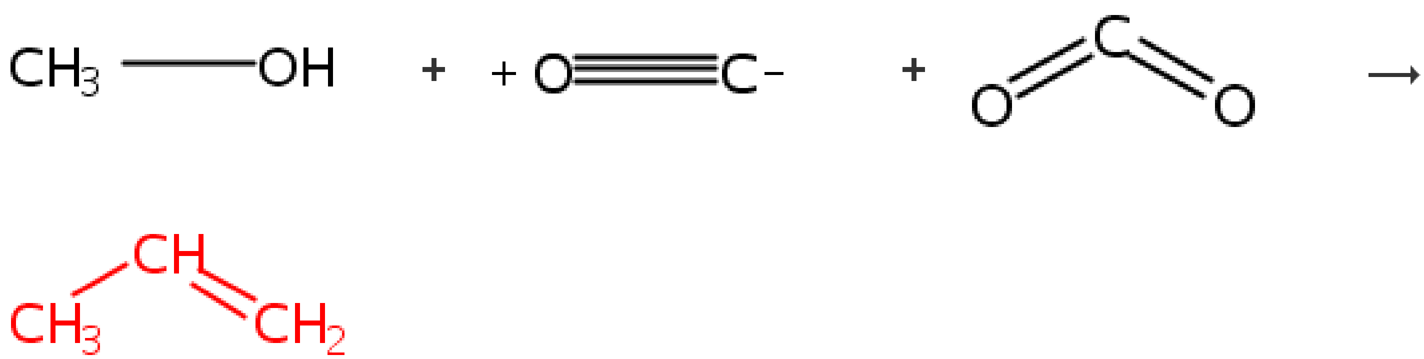
References

Polymer emulsifier for emulsion explosive and its preparation method

By Zhao, Huaping et al

From Faming Zhuanli Shenqing, 105348416, 24 Feb 2016

27. Single Step



99%

Overview

Steps/Stages

1.1 R:H_2

Notes

Reactants: 3, Reagents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

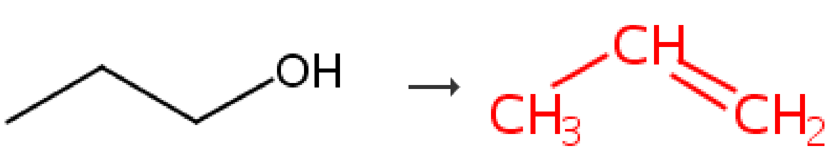
References

A process for preparing propylene from methanol

By Xie, Shengbin et al

From Faming Zhuanli Shenqing, 103880577, 25 Jun 2014

28. Single Step



99%

Overview

Steps/Stages

1.1 S:H_2O, 2 h, 250°C

Notes

thermal, optimization study, optimized on catalyst, optimized on temperature, HZSM-5-30 catalyst used, Reactants: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Propylene from Renewable Resources: Catalytic Conversion of Glycerol into Propylene

By Yu, Lei et al

From ChemSusChem, 7(3), 743-747; 2014

Reaction Protocol

Procedure

1. Perform the dehydration of 1-PO in a vertical fixed-bed reactor (inner diameter 10 mm, length 500 mm) under atmospheric pressure at 250°C.
2. Place the catalyst (2.0 g) in the middle of a stainless reactor.

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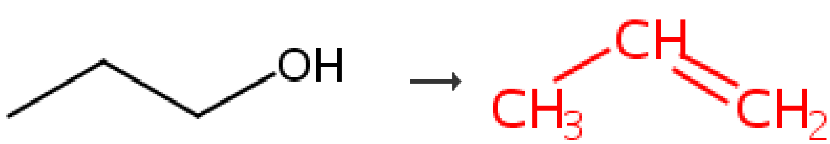
29. Single Step



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Overview

Steps/Stages

1.1 50 h, 623K

Notes

solid-supported catalyst, fixed bed flow reactor used, aluminum containing mesoporous silica MCM-41 used as catalyst, space velocity=6400 per hour, mechanism studied, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

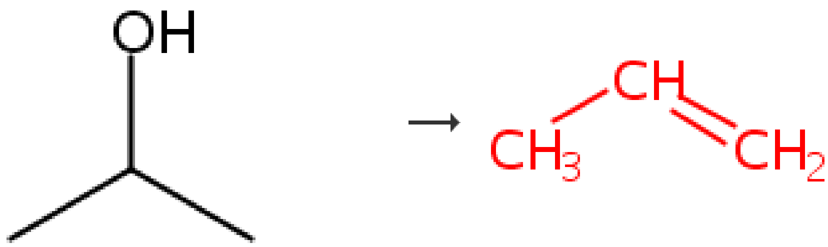
References

Fast and quantitative dehydration of lower alcohols to corresponding olefins on mesoporous silica catalyst

By Haishi, Teruki et al

From Chemistry Letters, 40(6), 614-616; 2011

30. Single Step



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Overview

Steps/Stages

1.1 C:Carbon, 330°C

Notes

gas phase, thermal, optimized on temperature, flow system used, optimization study, phosphorylated mesoporous carbon used as catalyst, solid acid catalyst prepared and used, selective for dehydration of isopropanol, Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Phosphorylated mesoporous carbon as a solid acid catalyst

By Mayes, Richard T. et al

From Physical Chemistry Chemical Physics, 13(7), 2492-2494; 2011

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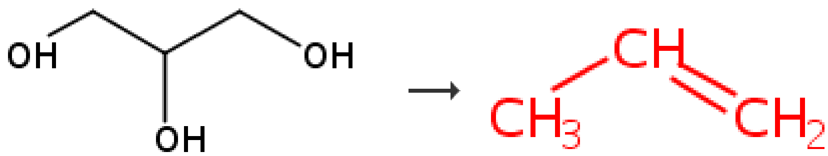
31. Single Step



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Overview

Steps/Stages

Notes

1.1 R:Triflic acid, R:H_2, C:1198348-03-6, S:Sulfolane, 24 h, 250°C, 800 psi

chemoselective, optimized on solvent, catalyst and reaction temperature, high pressure, optimization study, Reactants: 1, Reagents: 2, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Stainless Steel As a Catalyst for the Total Deoxygenation of Glycerol and Levulinic Acid in Aqueous Acidic Medium

By Di Mondo, Domenico et al

From ACS Catalysis, 1(4), 355-364; 2011

Experimental Procedure

Hydrogenation Experiments. In a typical deoxygenation experiment 25 mL of solution of substrates (500 mmol/L of glycerol or levulinic acid) and internal standard (dimethyl sulfone; 100 mmol/L) in water were dispensed into the 50 mL Autoclave Engineers minireactor. The appropriate amounts of catalyst and/or HOTf were added (the latter using a microliter syringe) and the reactor sealed. Using a manifold, the reactor was then evacuated using an aspirator pump (p_{min} = 16 Torr). The reactor was then pressurized to 800 psi with H_2(g) and vented three times followed by a final pressurization to 800 psi. The reaction was started by switching on the heating mantle (defining t = 0 min.). The maximum reaction temperature of 250°C was reached within 30 min for all reactors employed. For some reactions the reaction pressure was monitored as a function of time using a Setra C206 pressure transducer fitted to the reactor. At the end of the reaction (24 h), the reactors was cooled to room-temperature and then with an ice-bath (0 °C).While venting the reactor to ambient pressure, a gas sample from the head a space of the reactor was captured using a balloon and analyzed by GC-MS and micro-GC-TCD. Liquid samples obtained from the reaction solution were analyzed by GC and GC-MS as indicated above. Precipitates formed in the reaction mixtures were isolated by centrifugation and then dried at 110°C before SEM-XRF and ICP-MS analysis. propene, yield 100%

Reaction Protocol

Procedure 1. Dispense 25 mL of solution of substrate (500 mmol/L of glycerol or levulinic acid) and internal standard (dimethyl sulfone; 100 mmol/L) in water into the 50 mL Autoclave Engineers minireactor in a typical deoxygenation experiment.
2. Add the appropriate amounts of catalyst and/or HOTf (the latter using a microliter syringe) and the reactor sealed.

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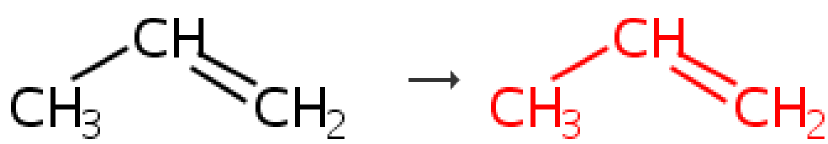
32. Single Step



100%

Overview

Steps/Stages

Notes

1.1 C:868074-63-9, S:PhMe, 30 min, -20°C; 30 min, 25°C

1.2 R:HCl, S:MeOH

stereoselective, [t-BuNSiMe2(3,6-t-Bu2Flu)]TiMe2 combined with trialkylaluminum-free modified methylaluminoxane used as catalyst, incremental addition of 1-propene in stage 1, optimization study, optimized on stoichiometry of propene and reaction temperature, Batch method used, Schlenk technique used, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Synthesis of stereoblock polypropylene by change of temperature in living polymerization

By Cai, Zhengguo et al

From Macromolecular Research, 18(8), 737-741; 2010

Experimental Procedure

Polymerization Procedure. Polymerization was performed in a 100 mL glass reactor equipped with a magnetic stirrer and carried out by the following batch method. After the reactor was charged with prescribed amounts of dMMAO, solvent (toluene) and propylene, polymerization was started by the addition of 1 mL solution of catalyst (20 µmol) in toluene and conducted for 30 min and terminated with acidic methanol. The polymers obtained were adequately washed with methanol and dried under vacuum at 60 °C for 6 h. After the propylene polymerization with 0.63 g of propylene at -20 °C for 30 min, 0.63 g of propylene was added at 25 °C, and the polymerization was conducted for further 30 min. product: Polymer of propylene, Entry: 10, Yield (%): 100. $M_n(\times10^4)$: 10.1, M_w/M_n: 1.32, N (µmol): 12.

Reaction Protocol

Procedure

1. Perform the polymerization in a 100 mL glass reactor equipped with a magnetic stirrer.
2. Charge the reactor with trialkylaluminum-free modified methylaluminoxane, toluene and 0.63 g of propylene at -20 °C for 30 minutes.

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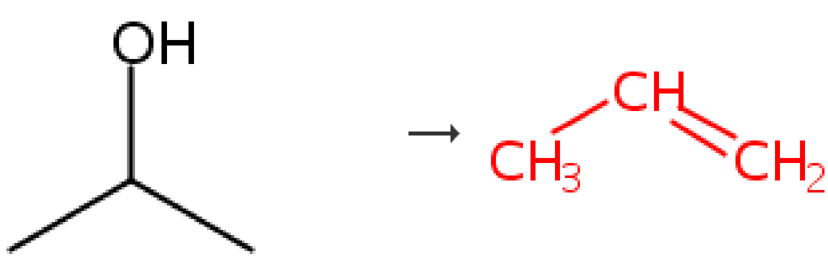
33. Single Step



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Overview

Steps/Stages

Notes

1.1 gas phase, catalyst prepared and used, optimized on nature of acidic centers of KAU, PMS-SO3/KAU catalyst used, optimization study, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

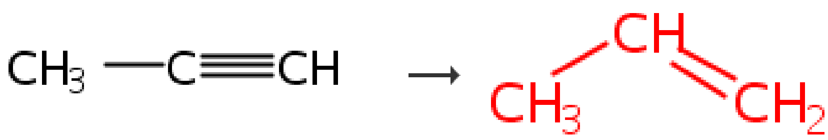
References

New low-temperature heterogeneous-catalytic systems based on modified activated carbon

By Diyuk, V. E. et al

From Ukrainskii Khimicheskii Zhurnal (Russian Edition), 76(1-2), 95-100; 2010

34. Single Step



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Overview

Steps/Stages

1.1 R:H_2, C:Cu, C:Ni, C:Fe, 523K, 1 bar

Notes

thermal, gas phase, quartz fixed-bed microreactor used, heterogeneous Cu-Ni-Fe prepared and used as catalyst, optimization study, optimized on catalyst, reaction time, temperature and stoichiometry of reactant and reagent, alternatively reaction carried out in heterogeneous Cu-Ni-Al catalyst decreased propene selectivity, Reactants: 1, Reagents: 1, Catalysts: 3, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Cooperative Effects in Ternary Cu-Ni-Fe Catalysts Lead to Enhanced Alkene Selectivity in Alkyne Hydrogenation

By Bridier, Blaise and Perez-Ramirez, Javier

From Journal of the American Chemical Society, 132(12), 4321-4327; 2010

Experimental Procedure

General/Typical Procedure: The gas-phase hydrogenation of alkynes was studied at ambient pressure in a quartz fixed-bed microreactor (12 mm i.d.) using a catalyst mass of 0.15 g (sieve fraction 200-400 µm) and a total gas flow of 42 cm^3 min^{-1} (space velocity (*SV*) 16 800 cm^3 g^{-1} h^{-1}). The samples were pretreated in He at 573 K and reduced in 5 vol % H_2/He at 773 K for 30 min. Isothermal tests were carried out at 423-523 K using the following feed mixtures: 2.5/7.5/90 $C_3H_4(C_2H_2)$/ H_2/He and 1.5/8.1/4.5/85.9 $C_3H_4(C_2H_2)/C_3H_6(C_2H_4)/H_2$/He. Each temperature was typically held for a period of 5 h. Heating and cooling ramps of 5 K min^{-1} were used in all the steps. The stability of the optimal catalyst was evaluated in the above alkyne + alkene mixtures at 523 K during 30 h. The influence of the hydrogen-toalkyne ratio (H_2/alkyne) 1-12) was studied at 523 K. In these tests, the inlet alkyne concentration was kept at 2.5 vol % and the H2 concentration was progressively decreased from 30 to 2.5 vol % by balancing the mixture with He in order to keep the total flow constant. Propyne, ethyne, propene, ethene, propane, and ethane were analyzed online using an Agilent GC6890N gas chromatograph equipped with a GS-GasPro column and a thermal conductivity detector. The selectivity to the alkene (alkane) was determined as the amount of alkene (alkane) formed divided by the amount of reacted alkyne. The selectivity to oligomers was obtained as: *S*(oligomers) = 1 - *S*(alkene) - *S*(alkane).

Reaction Protocol

Procedure 1. Study the gas-phase hydrogenation of alkyne at ambient pressure in a quartz fixed-bed microreactor (12 mm i.d.) using a catalyst mass of 0.15 g (sieve fraction 200-400 µm) and a total gas flow of 42 cm^3 min^{-1} (space velocity (*SV*) 16 800 cm^3 $g^{-1}h^{-1}$).
2. Pretreat the samples in He at 573 K.

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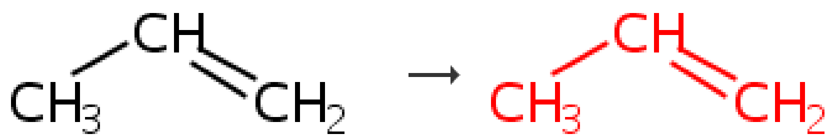
35. Single Step



100%

Overview

Steps/Stages

1.1 C:1198154-18-5, S:$Me(CH_2)_5Me$, 30 min, 0°C

1.2 R:MeOH

Notes

optimization study, optimized on stoichiometry, product formed subjected to post-polymerization for 30 minutes, acidic methanol used, Schlenk technique used, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

References

A Highly Active Catalyst Composed of ansa-Fluorenylamidodimethyltitanium Derivative for Propene Polymerization

By Shiono, Takeshi et al

From Topics in Catalysis, 52(6-7), 675-680; 2009

Experimental Procedure

(ii) Batch-type method: After a certain amount of gaseous propene was dissolved in the heptane solution of dMMAO, polymerization was started by the addition of 1 mL solution of catalyst (20 µmol) in heptane. Polymerization was conducted for 30 min. In the case of postpolymerization, the same amount of propene was added after 30-min polymerization, and the polymerization was successively conducted for another 30 min. The polymerizations were terminated with acidic methanol. The polymers obtained were adequately washed with methanol and dried under vacuum at 60°C for 6 h. Polypropene; Yield 100 %; temperature = 0 °C. M_n (× 10^4): 15.4; M_w/M_n: 3.26.

Reaction Protocol

Procedure 1. Dissolve a certain amount of gaseous propene in the heptane solution of dMMAO.
2. Start polymerization by the addition of 1 mL solution of catalyst (20 µmol) in heptane.

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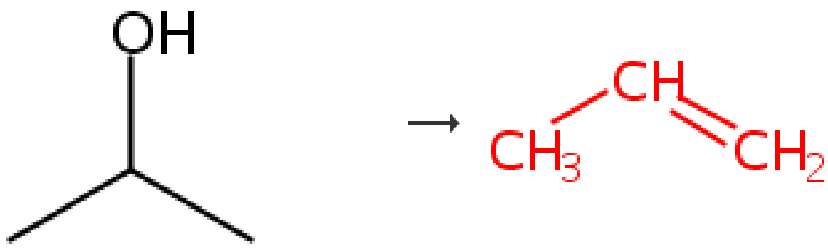
36. Single Step



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Overview

Steps/Stages

1.1 C:MgO, C:Al_2O_3, 523K

Notes

pulse-reaction system used, product depends on temperature and catalyst used, Reactants: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

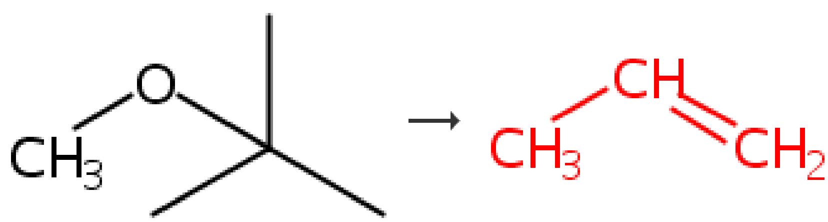
References

Synthesis of Novel Solid Base of MgO Covered with Metal Oxides

By Matsuhashi, Hiromi

From Topics in Catalysis, 52(6-7), 828-833; 2009

37. Single Step



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Overview

Steps/Stages

Notes

1.1 60 min, 550°C

gas phase, H type of aluminosilicate and quartz sand used, fixed bed flow reactor used, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Manufacture of propylene by catalytic MTO process

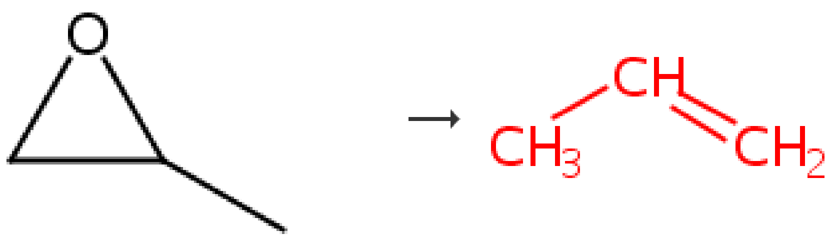
By Hayashi, Mikio et al

From Jpn. Kokai Tokkyo Koho, 2009161444, 23 Jul 2009

Experimental Procedure

The reaction was filled up with 50 mg of the above-mentioned catalyst, and the mixture of the quartz sand 0.45g to the reaction pipe made from quartz 6 mm in inner diameter using atmospheric pressure fixed bed flow reactor. To this reactor, gas prepared by methyl -tert-butyl ether (18 vol%), nitrogen (82% by volume) was fed through the evaporator. Space velocity of methyl-tert-butyl ether was 5.16Hr-1, the reaction temperature (reactor inlet gas concentration) was 550 °C. After the start of the reaction, analysis of the product by gas chromatography was performed after 60 minutes, the results have shown in Table 1. The conversion of methyl-tert-butyl ether has reached 100%, the selectivity of propylene was 34.8%. In addition, the sum of the selectivity of the by-produced aromatic compound was 1.0% low level.

38. Single Step



92%

Overview

Steps/Stages

1.1 R:H_2O_2, C:Ti, C:Si, S:H_2O, S:MeOH, 3-6 h, 140°C, 2.1 MPa

Notes

catalyst prepared and used, recyclable catalyst, selectivity: 95.2%, conversion: 97.1, fixed bed reactor used, optimization study, optimized on various reaction condition, Industrial, alumina support used, green chemistry-catalyst, high pressure, regioselective, solid-supported catalyst, Reactants: 1, Reagents: 1, Catalysts: 2, Solvents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

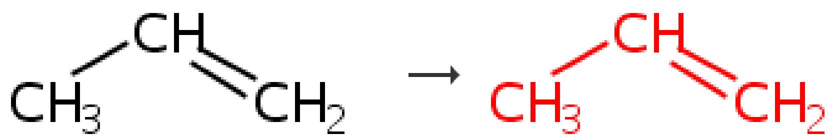
References

Catalyst for preparing propylene oxide by propylene oxidation, its preparation method and application

By Li, Xiangwei and Gao, Zhongmin

From Faming Zhuanli Shenqing, 110252394, 20 Sep 2019

39. Single Step



94%

Overview

Steps/Stages

1.1 C:2028267-70-9, S:PhMe, S:Me(CH_2)$_4$Me, rt → 85°C; 80 min, 85°C, 0.8 MPa

1.2 R:EtOH

Notes

autoclave used, methylaluminoxane used, alternative preparation gave lower yield, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

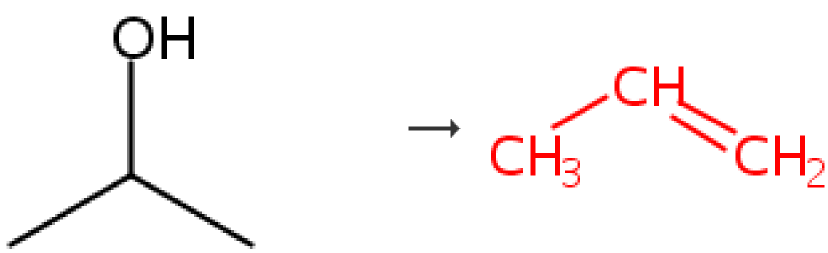
References

Thermoplastic elastomer composition with excellent heat resistance and fluidity

By Ohtaki, Hisashi et al

From Jpn. Kokai Tokkyo Koho, 2016183337, 20 Oct 2016

40. Single Step



95%

Overview

Steps/Stages

1.1 C:MoO_3, C:C_5H_5N, C:2,6-Lutidine, 225°C

Notes

solid-supported catalyst, fixed bed reactor used, optimization study, optimized on catalyst, hydroxyapatite supported used, Reactants: 1, Catalysts: 3, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Selective Oxidation of Methanol to Formaldehyde Over Active Molybdenum Oxide Supported on Hydroxyapatite Catalysts

By Said, Abd El-Aziz A. et al

From Catalysis Letters, 146(1), 82-90; 2016

Experimental Procedure

The effect of reaction temperature on the dehydration of of IPA over 10 wt% MoO_3 supported on HAP previously saturated with PY and DMPY was carried out and the obtained results are cited in Table 2. The results reveal that the adsorption of PY or DMPY retards the conversion activity of IPA more than that of unsaturated catalyst. In addition, the catalyst restored its activity (acidity) after removal of PY or DMPY on increasing the reaction temperature up to 225 °C.

Reaction Protocol

Procedure 1. Carry out the effect of reaction temperature on the dehydration ofIPA over 10 wt% MoO_3 supported on HAP previously saturated with PY and DMPY.
2. Reveal the results that the adsorption of PY or DMPY retards the conversion activity of IPA more than unsaturated catalyst.

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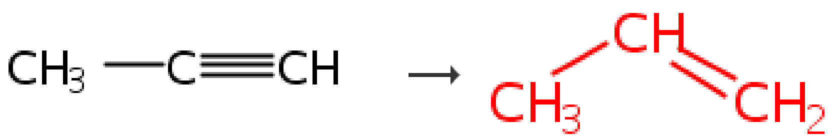
41. Single Step



97%

Overview

Steps/Stages

1.1 R:H_2, C:192575-28-3, 373K, 1 bar

Notes

gallium-containing ceria catalyst prepared and used, continuous fixed-bed flow micro-reactor used, Reactants: 1, Reagents: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

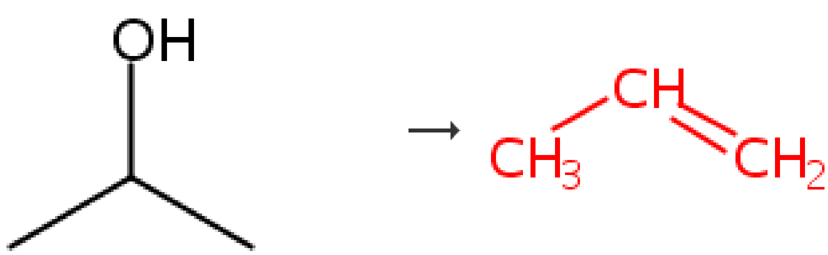
References

Promoted ceria catalysts for alkyne semi-hydrogenation

By Vile, Gianvito et al

From Journal of Catalysis, 324, 69-78; 2015

42. Single Step



100%

Overview

Steps/Stages

1.1 773K

Notes

other product also detected, optimization study, MCM-41 solid support used as catalyst, optimized on catalyst and temperature, gas phase, solid-supported catalyst, thermal, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

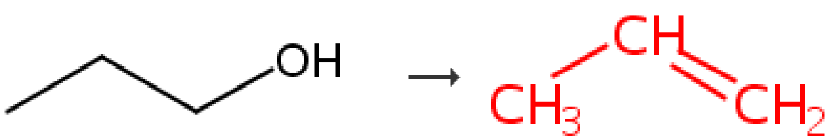
References

Preparation of olefins from alcohols by use of ordered mesoporous catalysts in high yield

By Iwamoto, Masakazu et al

From Jpn. Kokai Tokkyo Koho, 2008255104, 23 Oct 2008

43. Single Step



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Overview

Steps/Stages

1.1 673K

Notes

optimization study, optimized on catalyst, MCM-41 solid support used as catalyst, temperature dependent product formation, gas phase, solid-supported catalyst, thermal, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

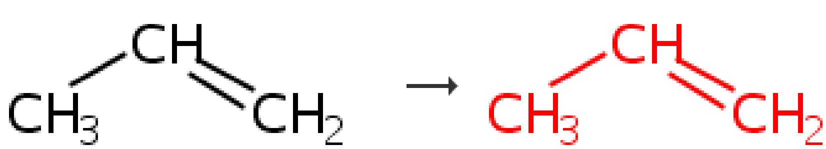
References

Preparation of olefins from alcohols by use of ordered mesoporous catalysts in high yield

By Iwamoto, Masakazu et al

From Jpn. Kokai Tokkyo Koho, 2008255104, 23 Oct 2008

44. Single Step



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Overview

Steps/Stages

1.1 C:868074-63-9, S:Me(CH_2)$_5$Me, 1 h, 0°C

1.2 R:MeOH, 0°C

Notes

optimized on solvent/solvent systems (PhCl,heptane) on polymer structure, modified methylaluminoxane used as cocatalyst, optimization study, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

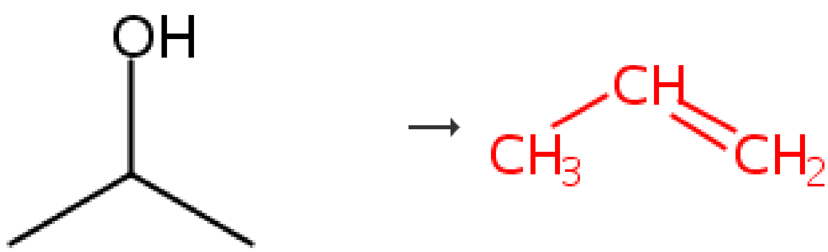
References

Effects of solvents in living polymerization of propene with [t-BuNSiMe2(3,6-t-Bu2Flu)]TiMe2-MMAO catalyst

By Shiono, Takeshi et al

From Studies in Surface Science and Catalysis, 161(Progress in Olefin Polymerization Catalysts and Polyolefin Materials), 47-52; 2006

45. Single Step



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Overview

Steps/Stages

1.1 C:12766-39-1, 1 h, 300°C, 1 atm

1.2 5 h, 300°C, 1 atm

Notes

reaction monitored every 15m, in-situ generated catalyst, optimized on catalyst, flow system used, alternative preparation shown, optimization study, Reactants: 1, Catalysts: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Thermal Activation of Molecular Tungsten Halide Clusters with the Retention of an Octahedral Metal Framework and the Catalytic Dehydration of Alcohols to Olefins as a Solid Acid Catalyst

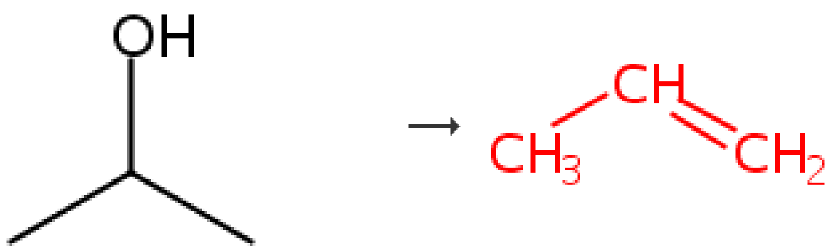
By Kamiguchi, Satoshi et al

From Journal of Cluster Science, 18(2), 414-430; 2007

Experimental Procedure

Catalytic Measurements Alcohol dehydration was performed using a conventional continuous-flow microreactor operated at atmospheric pressure [27]. In a typical experiment, a weighed cluster sample (30 mg) was placed in a borosilicate glass tube (i.d. = 3 mm) surrounded by a close-fitting copper tube, and then placed in the center of an electric furnace. The cluster sample was initially treated from ambient temperature to 300 °C for 1 h in flowing helium gas (1.2 L/h). The temperature reached the set point within a period of 10 min. The reaction was initiated by feeding ethanol (0.24 mL/h, 4.2 mmol/h) into the helium using a micro feeder at the same temperature as the gas. The reaction was monitored every 15 min by sampling the reaction gas (1 mL) using a six-way valve maintained at 60 °C, followed by analysis using the online GLC. The reactor effluent was frozen in a dry-ice trap for subsequent analysis. Conversion (%)[b] 100.0

46. Single Step



100%

Overview

Steps/Stages

1.1 R:Benzene, C:ZrO_2, C:TiO_2, 210°C, 1 atm; 1 h, 210°C, 1 atm

Notes

10:1 molar ratio benzene:2-propanol, catalyst was not loaded with sulphate, reaction was carried in gas phase using nitrogen as the carrier gas, Reactants: 1, Reagents: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

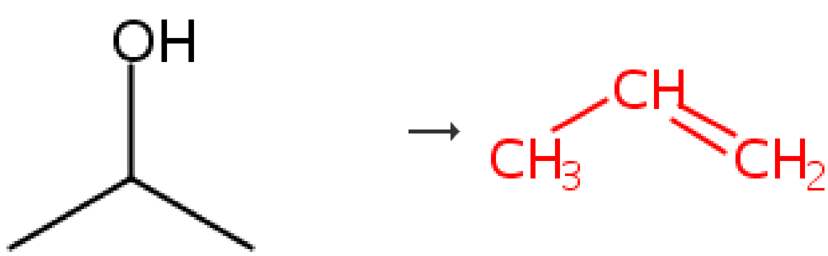
References

Studies on structural properties, surface acidity and benzene isopropylation activity of sulphated ZrO2-TiO2 mixed oxide catalysts

By Das, D. et al

From Microporous and Mesoporous Materials, 80(1-3), 327-336; 2005

47. Single Step



100%

Overview

Steps/Stages

1.1 R:Benzene, C:ZrO_2, C:TiO_2, 210°C, 1 atm; 1 h, 210°C, 1 atm

Notes

10:1 molar ratio benzene:2-propanol, catalyst was loaded with 5 wt% of sulphate, reaction was carried in gas phase using nitrogen as the carrier gas, Reactants: 1, Reagents: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

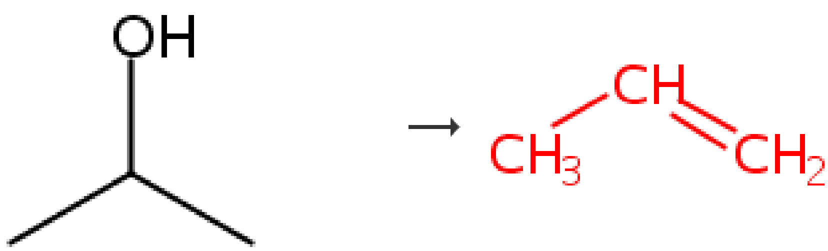
References

Studies on structural properties, surface acidity and benzene isopropylation activity of sulphated ZrO2-TiO2 mixed oxide catalysts

By Das, D. et al

From Microporous and Mesoporous Materials, 80(1-3), 327-336; 2005

48. Single Step



100%

Overview

Steps/Stages

1.1 R:Benzene, C:ZrO_2, C:TiO_2, 210°C, 1 atm; 1 h, 210°C, 1 atm

Notes

10:1 molar ratio benzene:2-propanol, catalyst was loaded with 2 wt% of sulphate, reaction was carried in gas phase using nitrogen as the carrier gas, Reactants: 1, Reagents: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

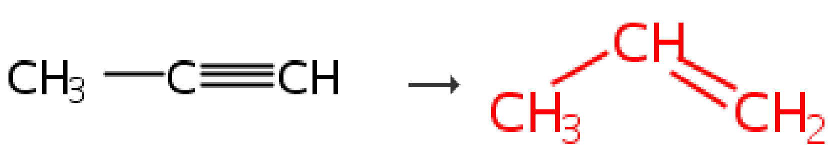
References

Studies on structural properties, surface acidity and benzene isopropylation activity of sulphated ZrO2-TiO2 mixed oxide catalysts

By Das, D. et al

From Microporous and Mesoporous Materials, 80(1-3), 327-336; 2005

49. Single Step



90%

Overview

Steps/Stages

1.1 R:H_2, C:Pd, 35°C, 0.1 MPa

Notes

product depend on reaction conditions,alternate reaction conditions also shown,conversion =94.1 %,SIRAL supported palladium octahedron nanocrystal catalyst prepared and used,catalyst activated before use, Reactants: 1, Reagents: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

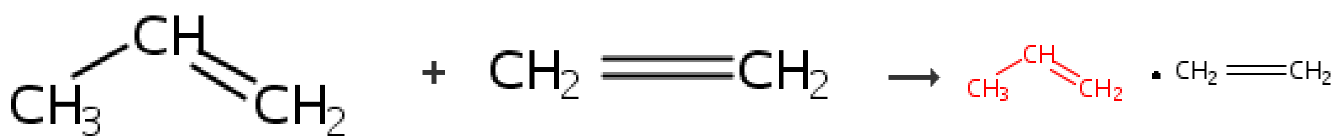
References

Revealing the Active Sites of Pd Nanocrystals for Propyne Semihydrogenation: From Theory to Experiment

By Xu, Yong et al

From ACS Catalysis, 9(9), 8471-8480; 2019

50. Single Step



93%

Overview

Steps/Stages

1.1 C:2121530-27-4, C:120144-90-3, C:BHT, S:$Me(CH_2)_5Me$, 30 min, 25°C

1.2 R:$MeCH=CH_2$, 30 min, 25°C, 1 atm

1.3 S:MeOH, acidify

Notes

Toluene solvent may also be used, unspecified acid used (stage 3), Reactants: 2, Reagents: 1, Catalysts: 3, Solvents: 2, Steps: 1, Stages: 3, Most stages in any one step: 3

References

Highly Active ansa-(Fluorenyl)(amido)titanium-Based Catalysts with Low Load of Methylaluminoxane for Syndiotactic-Specific Living Polymerization of Propylene

By Sun, Yanjie et al

From Organometallics, 36(16), 3009-3012; 2017

Reaction Protocol

Procedure

1. Dissolve a certain amount of gaseouspropylene in the heptane solution of MMAO/BHT, start polymerization by the addition of 1 ml solution of catalyst (10 µmol) in heptanes.
2. Add a prescribed amount of propylene of ethylene after the thirty-minute homopolymerization of propylene.

View more...

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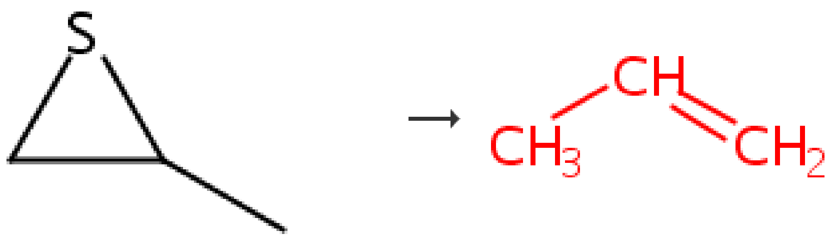
51. Single Step



95%

Overview

Steps/Stages

1.1 C:120666-13-9, rt

Notes

Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

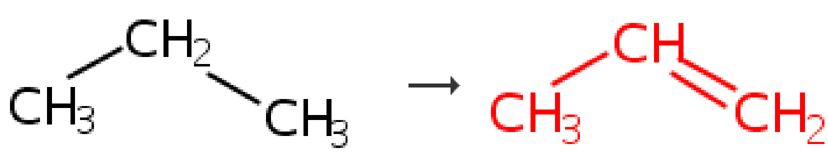
References

Proazaphosphatrane

By Verkade, John G. and Urgaonkar, Sameer

From e-EROS Encyclopedia of Reagents for Organic Synthesis, , 1-13; 2012

52. Single Step



95%

Overview

Steps/Stages

1.1 C:Ca, 575°C

Notes

solid-supported catalyst, optimization study, optimized on catalyst, alumina support used, Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

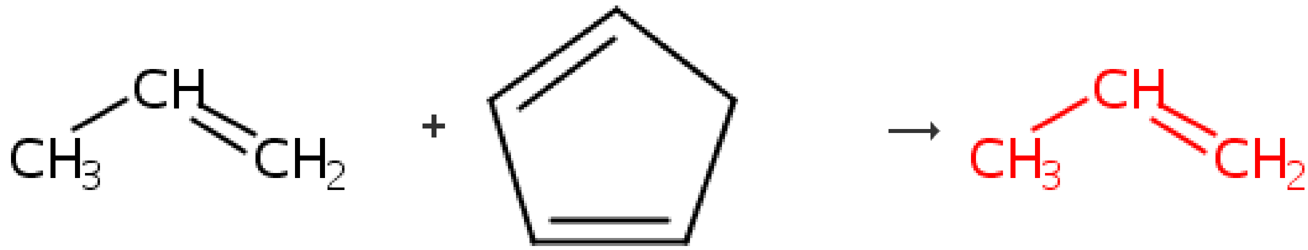
References

Correlation between melting temperatures of alkaline earth elements and their effect as promoters of Pt-Sn/γ-Al2O3 catalyst in propane dehydrogenation reaction

By Alhamed, Yahia et al

From Comptes Rendus de l'Academie Bulgare des Sciences, 66(7), 997-1004; 2013

53. Single Step



butenone-terminated

hexadecylbicycloheptenyl ethanone-function

95%

Overview

Steps/Stages

1.1 C:(*i*-PrO)$_2$TiCl$_2$, S:PhMe, 36 h, rt

Notes

Diels-Alder reaction, glovebox used, scintillation vial used, capped flask used, product obtained with 1,3-Cyclopentadiene, DCM solvent may also be used, Reactants: 2, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

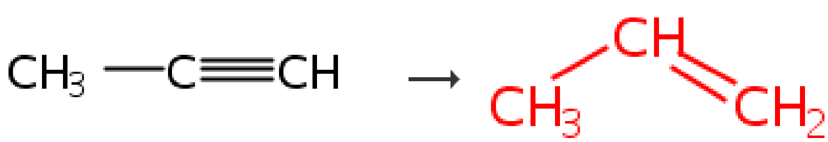
References

Preparation of bottlebrush polymers via ring-opening metathesis polymerization

By Stewart, Ian C. and Harris, David T.

From U.S. Pat. Appl. Publ., 20140213732, 31 Jul 2014

54. Single Step



97%

Overview

Steps/Stages

Notes

1.1 R:H_2, C:124386-44-3, 523K, 1 bar

gas phase, other product also detected, Reactants: 1, Reagents: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

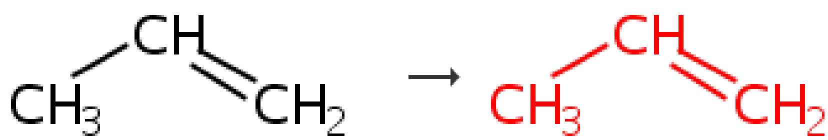
References

Surface state during activation and reaction of high-performing multi-metallic alkyne hydrogenation catalysts

By Bridier, Blaise et al

From Chemical Science, 2(7), 1379-1383; 2011

55. Single Step



100%

Overview

Steps/Stages

1.1 C:154755-39-2, C:137390-08-0, S:PhMe
1.2 S:Me$(CH_2)_4$Me, 100°C

Notes

autoclave and methylalumoxane used, inverse addition (stage 2), thermal (stage 2), Reactants: 1, Catalysts: 2, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

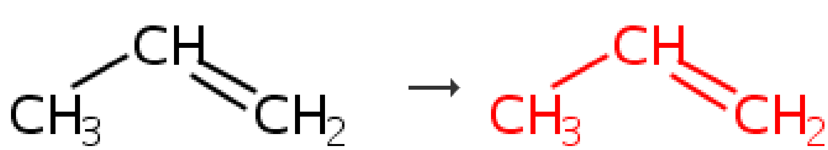
References

Mixed metallocene catalyst system for olefin polymerization, polymers produced using the catalysts, and adhesive use

By Jiang, Peijun et al

From PCT Int. Appl., 2004046214, 03 Jun 2004

56. Single Step



styrene deriv.-terminated

100%

Overview

Steps/Stages

Notes

1.1 R:HCl, S:MeOH, S:THF, 50°C; 4 h, 50°C

1.2 R:NaOH, S:MeOH

alternative preparation shown, Reactants: 1, Reagents: 2, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Synthesis of isotactic polypropylene containing a terminal Cl, OH, or NH2 group via metallocene-mediated polymerization/chain transfer reaction

By Dong, J. Y. et al

From Macromolecules, 35(25), 9352-9359; 2002

Reaction Protocol

Procedure 1. Suspend the isolated PP-t-St-NSi_2 (2 g) in 50 mL of THF at 50 °C.
2. Add 2N methanolic hydrogen chloride solution dropwise to the reaction mixture.

View more...

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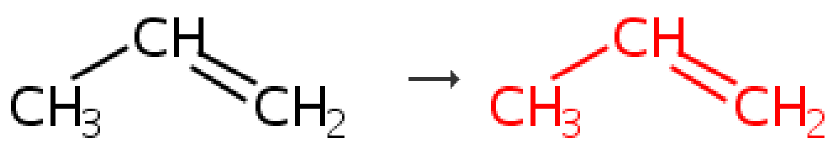
57. Single Step



styrene deriv.-terminated

100%

Overview

Steps/Stages

1.1 R:AcOH, R:$Bu_4N^+ \cdot F^-$, S:THF, 4 h, 50°C

Notes

alternative preparation shown, Reactants: 1, Reagents: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Synthesis of isotactic polypropylene containing a terminal Cl, OH, or NH2 group via metallocene-mediated polymerization/chain transfer reaction

By Dong, J. Y. et al

From Macromolecules, 35(25), 9352-9359; 2002

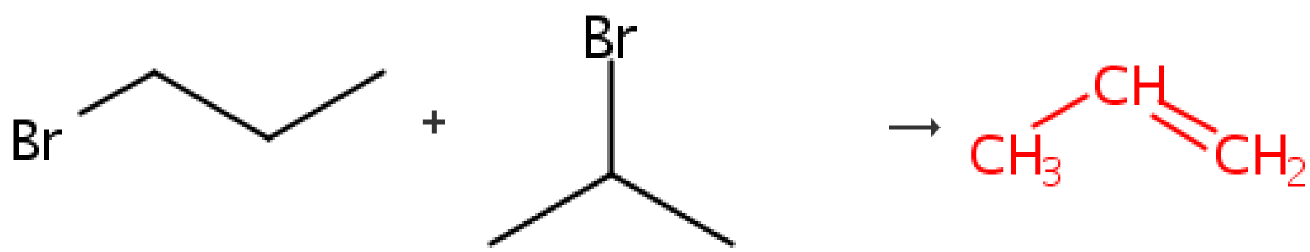
Reaction Protocol

Procedure 1. Suspend the isolated PP-t-St-OSi polymer (2 g) in 50 mL of THF.
2. Add 5 mL of acetic acid and tetrabutylammonium fluoride (2 mol per tert-butyldimethylsilys group) to the reaction mixture.

View more...

View with MethodsNow

58. Single Step



100%

Overview

Steps/Stages

1.1 R:ZrO_2, R:CuO, rt → 220°C; 40 min, 220°C

Notes

selectivity, 95%, alternative reaction conditions shown, CuO/ZrO2 metal oxide prepared and used, alternative preparation shown, Reactants: 2, Reagents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

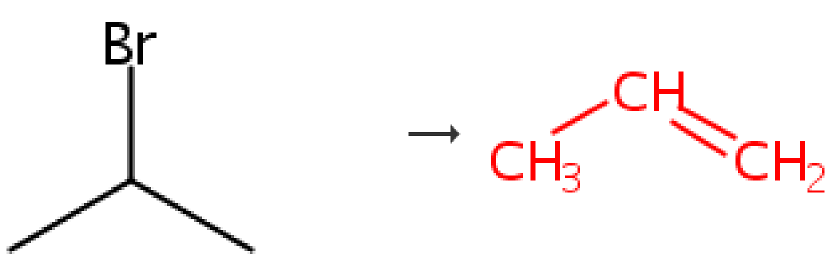
References

Integrated process for synthesizing alcohols, ethers, and olefins from brominated alkanes

By Grosso, Phil

From U.S., 6465699, 15 Oct 2002

59. Single Step



100%

Overview

Steps/Stages

Notes

1.1 R:ZrO_2, R:CuO, rt → 200°C; 40 min, 200°C

selectivity, >95%, alternative reaction conditions shown, CuO/ZrO2 metal oxide prepared and used, alternative preparation shown, Reactants: 1, Reagents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

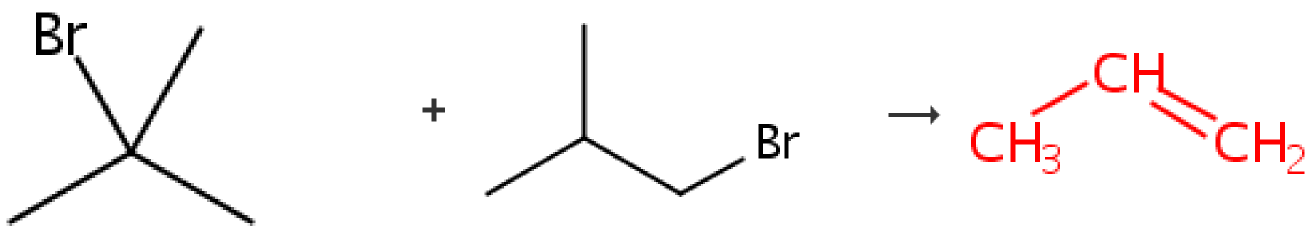
References

Integrated process for synthesizing alcohols, ethers, and olefins from brominated alkanes

By Grosso, Phil

From U.S., 6465699, 15 Oct 2002

60. Single Step



100%

Overview

Steps/Stages

1.1 R:CuO, R:ZrO_2, 40 min, rt → 220°C

Notes

selectivity, 95%, alternative preparation shown, CuO/ZrO2 metal oxide prepared and used, alternative reaction conditions shown, Reactants: 2, Reagents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

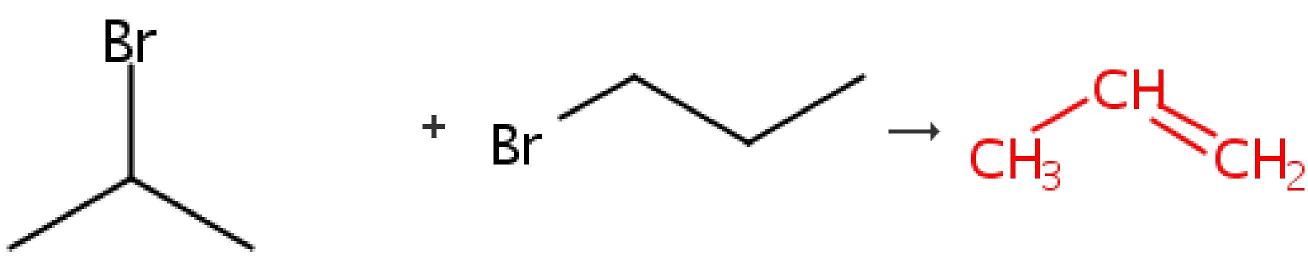
References

Integrated process for synthesizing alcohols, ethers, and esters from brominated alkanes

By Zhou, Xiao Ping et al

From U.S., 6465696, 15 Oct 2002

61. Single Step



100%

Overview

Steps/Stages

Notes

1.1 R:CuO, R:ZrO_2, 10 min, rt → 200°C

selectivity, 90%, alternative preparation shown, CuO/ZrO2 metal oxide prepared and used, Reactants: 2, Reagents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

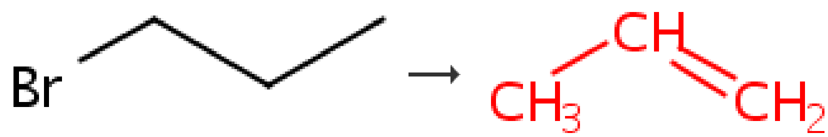
References

Integrated process for synthesizing alcohols, ethers, and esters from brominated alkanes

By Zhou, Xiao Ping et al

From U.S., 6465696, 15 Oct 2002

62. Single Step



100%

Overview

Steps/Stages

1.1 R:CuO, R:ZrO_2, 20 min, rt → 220°C

Notes

selectivity, 90%, alternative preparation shown, CuO/ZrO2 metal oxide prepared and used, Reactants: 1, Reagents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

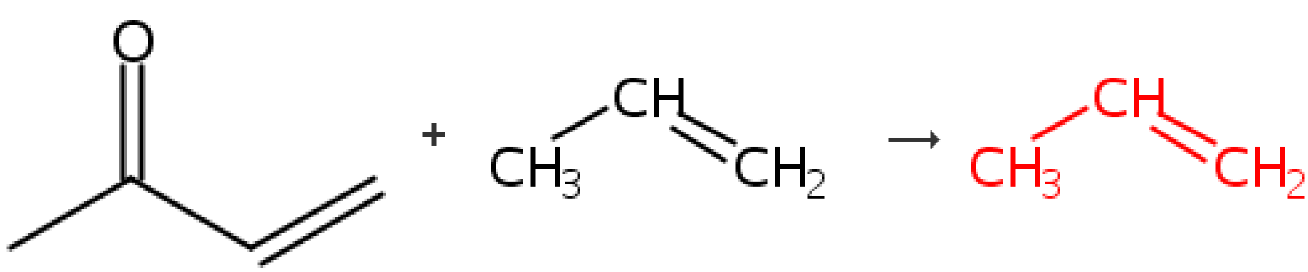
References

Integrated process for synthesizing alcohols, ethers, and esters from brominated alkanes

By Zhou, Xiao Ping et al

From U.S., 6465696, 15 Oct 2002

63. Single Step



vinyl-terminated

butenone-terminated

93%

Overview

Steps/Stages

Notes

1.1 S:PhMe, rt → 60°C
1.2 C:918870-76-5, S:PhMe, 16 h, 60°C

glovebox used, scintillation vial used, product obtained with 3-Buten-2-one, Reactants: 2, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

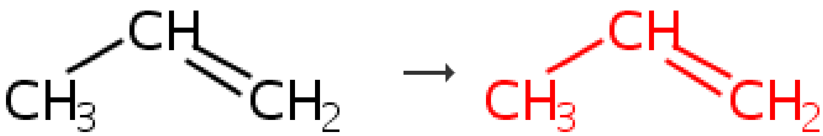
References

Preparation of bottlebrush polymers via ring-opening metathesis polymerization

By Stewart, Ian C. and Harris, David T.

From U.S. Pat. Appl. Publ., 20140213732, 31 Jul 2014

64. Single Step

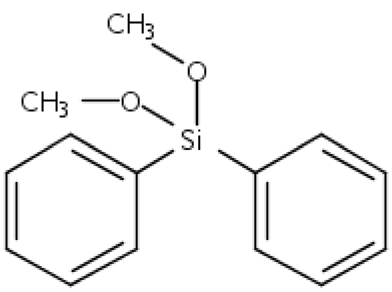


95%

Overview

Steps/Stages

1.1 R:



C:$AlEt_3$, C:84-74-2, C:651349-93-8, C:Montmorillonite sodium exchanged, 1,3-dihexadecyl-1H-imida, C:$MgCl_2$, C:$TiCl_4$, S:PhMe, 1.5 h, 60°C, 0.6 MPa

1.2 R:HCl, S:EtOH

Notes

catalyst prepared and used, optimization study, optimized on stoichiometry of triethyl aluminum and Titanium(IV) chloride, time, temperature, stainless autoclave used, product further converted into poly(propylene)/clay nanocomposites, ionic liquid-catalyst, Montmorillonite-KSF used, Reactants: 1, Reagents: 2, Catalysts: 6, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

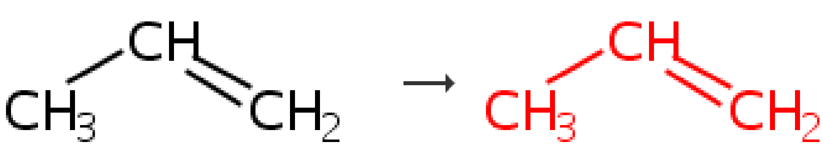
References

Preparation of Ziegler-Natta/ionic liquid modified clay compound catalyst and its catalysis during preparation of poly(propylene)/clay nanocomposites

By Wang, L. M.

From Asian Journal of Chemistry, 23(6), 2791-2794; 2011

65. Single Step



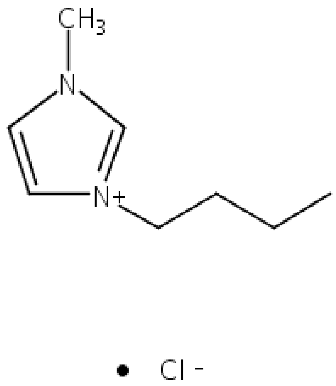
94%

Overview

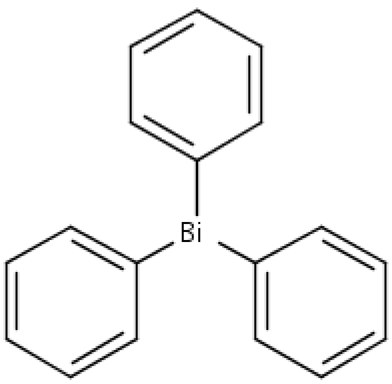
Steps/Stages

1.1 R:$EtAlCl_2$, R:$AlCl_3$

R:



R:



C:1334428-91-9, 45 min, 25°C

Notes

alternative reaction conditions shown, ionic liquid used, buffered solution, Reactants: 1, Reagents: 4, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

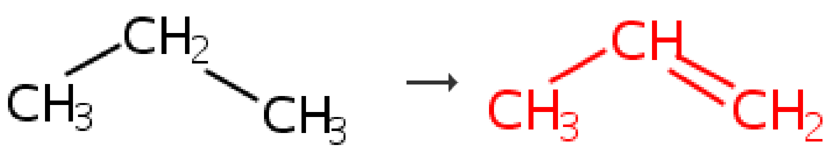
References

Olefin dimerization using buffered ionic liquids and nickel catalysts

By Doetterl, Matthias et al

From PCT Int. Appl., 2011112514, 15 Sep 2011

66. Single Step



94%

Overview

Steps/Stages

Notes

1.1 500°C, 2.3 bar

flow system, a porous catalyst bed was used, hydrogen removed and recycled using a protonic conductivity cell, gas phase, industrial, other products also detected (methane, ethene), water vapor and hydrogen used as diluent gases, hydrogen produced as byproduct, alternative reaction conditions shown, thermal, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

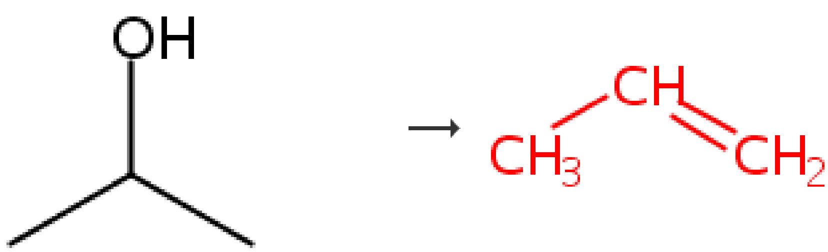
References

Process and unit for catalytic dehydrogenation of saturated hydrocarbons to unsaturated hydrocarbons

By Delahaye, Thibaud and Legendre, Olivier

From Fr. Demande, 2956398, 19 Aug 2011

67. Single Step



98%

Overview

Steps/Stages

1.1 180°C

Notes

Ge-ZSM-5 zeolites used as catalyst, thermal, Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

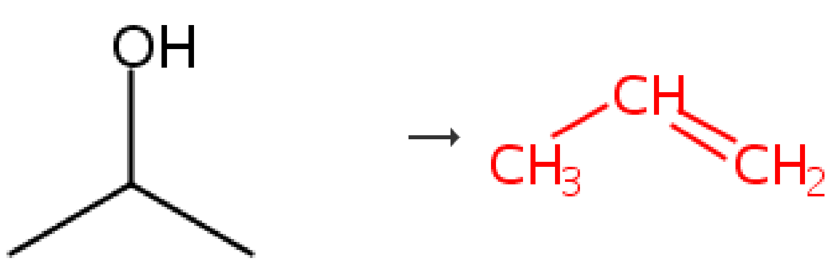
References

Improved catalytic activity upon Ge incorporation into ZSM-5 zeolites

By van de Water, Leon G. A. et al

From Journal of Catalysis, 223(1), 170-178; 2004

68. Single Step



98%

Overview

Steps/Stages

1.1 C:Al_2O_3, 300°C, 1 atm

Notes

thermal, optimization study, optimized on catalyst, Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Hydrogen manufacturing method and hydrogen manufacturing system

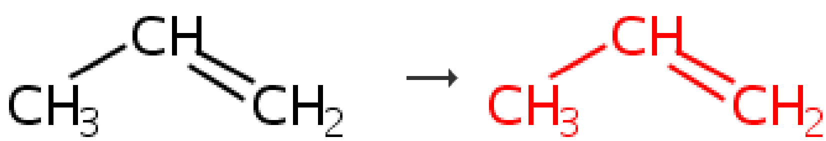
By Sata, Naoaki et al

From U.S. Pat. Appl. Publ., 20020083644, 04 Jul 2002

Experimental Procedure

General/Typical Procedure: Conversion Reaction of 2-Propanol. 2-propanol (99.9% or more purity, available from Tokuyama Co., Ltd.) was supplied from the raw material tank **1** at a speed of 0.23 cm^3/min to the vaporizer **19** by which 2-propanol was vaporized at 180°C., followed by diluting with nitrogen (99.9999% or more of purity) to provide a total flow of 500 cm^3/min (flow of standard state conversion). Subsequently, the raw material gas was passed through a conversion catalyst **12** in the converter **2** under atmospheric pressure at 300°C. Here, as the conversion catalyst **12**, a silica alumina catalyst (the content of alumina: approximately 13%, BET specific surface area of about 430 m^2/g) was used. The main reaction was dehydration reaction of 2-propanol. The yield of propene was about 93%. Conversion Reaction of 2-Propanol. The conversion reaction of 2-propanol was per formed similarly to the Example 1 except for the catalyst. In this example, the catalyst was an aluminum catalyst (an aluminum content of about 94% or more, a BET specific surface area of about 200 m^2/g). The main reaction was the dehydration reaction of 2-propanol. Where the yield of propene was about 98%.

69. Single Step



100%

Overview

Steps/Stages

1.1 R:H_2, C:345306-45-8, C:Al(*i*-Bu)$_3$, C:136040-19-2, S:PhMe, 5-7 min, 15°C → 70°C; 1 h, 70°C

1.2 R:CO_2

Notes

stereoselective, regioselective, optimization study, catalyst prepared and used, autoclave used, optimized on catalyst concentration, Reactants: 1, Reagents: 2, Catalysts: 3, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Chiral Ansa Metallocenes with Cp Ring-Fused to Thiophenes and Pyrroles: Syntheses, Crystal Structures, and Isotactic Polypropylene Catalysts

By Ewen, John A. et al

From Journal of the American Chemical Society, 123(20), 4763-4773; 2001

Experimental Procedure

Liquid Propylene Polymerizations. Polymerizations were conducted in a 1-or 10-gal stainless steel autoclave equipped with an airdriven Magnadrive (Autoclave Engineers Co.) stirrer and a steam/water temperature-controlled jacket. The autoclave was swept with dry argon at 90 °C for 1H prior to polymerization. For MAO-activated catalysts, the zirconocene was dissolved in a 10 wt % toluene solution of MAO, shaken for 10 min, and added to the reactor at 15 °C. Propylene (2.2 L) was added, stirring was initiated (500 rpm), and the reactor and contents were heated to the polymerization temperature within 5-7 min. For $[CPh_3][B(C_6F_5)_4]$-activated catalysts, a toluene solution of the zirconocene and $Al(i\text{-}Bu)_3$ was added to the reactor at 15 °C, followed by propylene (2.2 or 22 L for 1- and 10-gal reactor, respectively). Stirring was initiated (500 rpm), a toluene solution of $[CPh_3][B(C_6F_5)_4]$ was charged to the reactor with 100 mL of propane, and the contents were heated to the polymerization temperature within 5-7 min. In all polymerization tests, carbon monoxide gas was charged to the reactor 1h after reaching polymerization temperature, and the residual monomer was vented while the reactor was cooled to room temperature. The polymer was removed and dried in a vacuum oven at 50 °C for 1h before being weighed. Reported activities were calculated from polymer and zirconocene weights.

Reaction Protocol

Procedure

1. Conduct polymerizations in a 1-or 10-gal stainless steel autoclave equipped with an airdriven Magnadrive (Autoclave Engineers Co.) stirrer and a steam/water temperature-controlled jacket.
2. Sweep the autoclave with dry argon at 90 °C for 1 H prior to polymerization.

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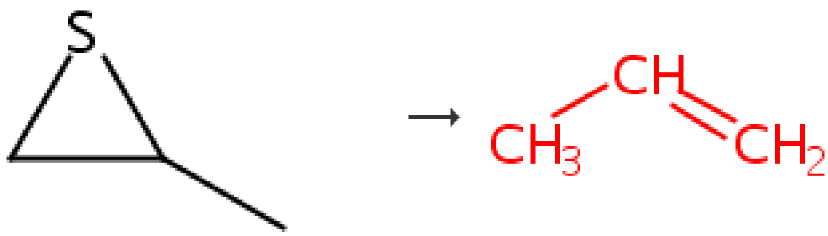
70. Single Step



100%

Overview

Steps/Stages

1.1 R:H_2S, C:70197-13-6, S:CD_3C.tbd.N

1.2 R:PPh_3

Notes

MTO pre-treated with H2S before addn. of reactant, Reactants: 1, Reagents: 2, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

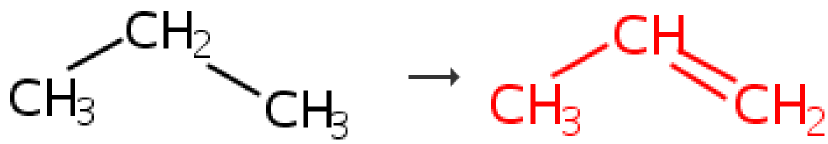
References

Stereospecific rhenium catalyzed desulfurization of thiiranes

By Jacob, Josemon and Espenson, James H.

From Chemical Communications (Cambridge), (11), 1003-1004; 1999

71. Single Step



90%

Overview

Steps/Stages

1.1 R:H_2, C:Pt, C:Sn, C:Na, C:Ca, C:Al_2O_3, 615°C; 620°C, 0.1 MPa

Notes

alternative reaction conditions gave lower yield, Reactants: 1, Reagents: 1, Catalysts: 5, Steps: 1, Stages: 1, Most stages in any one step: 1

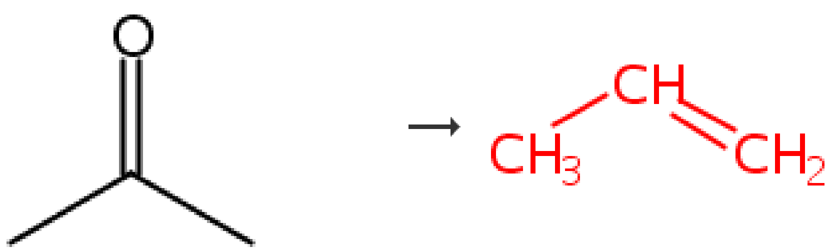
References

Production of olefin from low-carbon alkane

By Liu, Wenjie and Wu, Wenhai

From Faming Zhuanli Shenqing, 103420750, 04 Dec 2013

72. Single Step



91%

Overview

Steps/Stages

1.1 R:H_2, R:H_2O, C:In_2O_3, 61 h, 525°C

Notes

thermal, gas phase, incremental addition of reactant and agents after 1 hour, nitrogen used as carrier gas, Reactants: 1, Reagents: 2, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

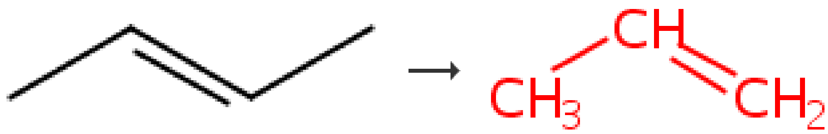
References

One-pot manufacture of propylene from acetone and hydrogen

By Iwamoto, Masakazu et al

From Jpn. Kokai Tokkyo Koho, 2012240912, 10 Dec 2012

73. Single Step



93%

Overview

Steps/Stages

1.1 C:Al, C:SiO_2, S:EtOH, 240-350°C, 0.07 MPa
1.2 C:WO_3, C:MoO_3, 310-410°C, 1.5 MPa
1.3 C:Al_2O_3, C:MgO, C:CaO, 395 h, 320°C, 0.9 MPa

Notes

ZM-5 molecular sieves used in stage 1, high pressure, Reactants: 1, Catalysts: 7, Solvents: 1, Steps: 1, Stages: 3, Most stages in any one step: 3

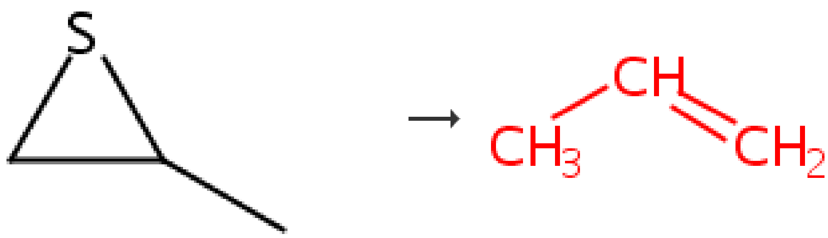
References

Method for production of propylene

By Wang, Mingdang et al

From Faming Zhuanli Shenqing, 101597199, 09 Dec 2009

74. Single Step



99%

Overview

Steps/Stages

1.1 R:Na, S:PhMe

Notes

Reactants: 1, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

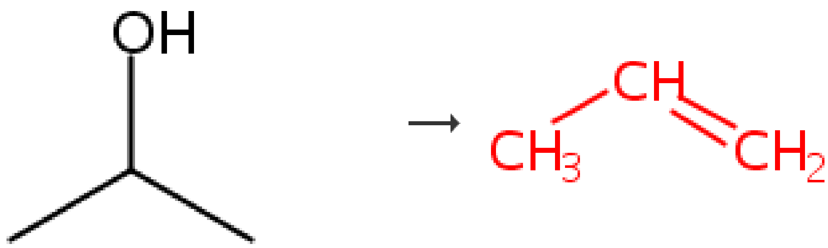
References

Mild and efficient desulfurization of alkyl sulfides with sodium

By Yu, Zhengkun and Verkade, John G.

From Tetrahedron Letters, 39(18), 2671-2674; 1998

75. Single Step



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Overview

Steps/Stages

1.1 C:1763-23-1, S:Decalin

Notes

Reactants: 1, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

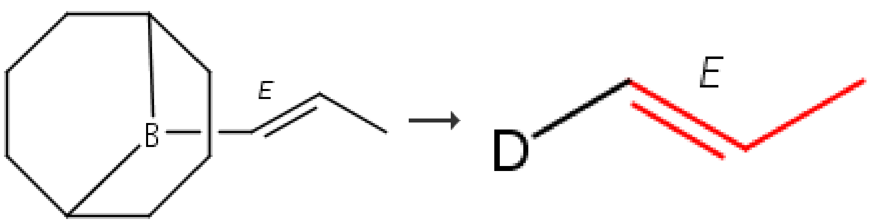
References

Perfluorooctanesulfonic acid catalyzed Friedel-Crafts alkylation with olefins in gas-liquid phase

By Fu, Xiangkai et al

From Chinese Chemical Letters, 4(4), 307-10; 1993

76. Single Step



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Overview

Steps/Stages

1.1 R:AcOD, S:$CDCl_3$

Notes

Reactants: 1, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

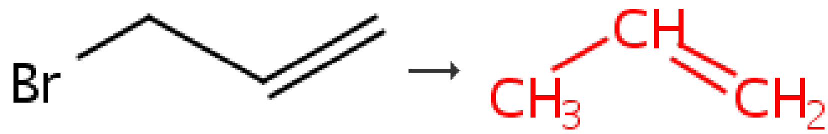
References

trans-Vinylboranes from 9-borabicyclo[3.3.1]nonane through dehydroborylation

By Colberg, Juan C. et al

From Journal of the American Chemical Society, 115(14), 6065-71; 1993

77. Single Step



82%

Overview

Steps/Stages

1.1 R:$PhSiH_3$, C:2108743-73-1, S:C_6D_6, 14 h, 120°C

Notes

J.Young NMR tube used, catalyst prepared and used, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

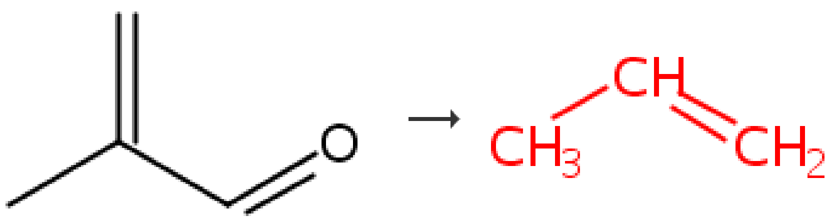
References

Hydrodehalogenation of alkyl halides catalyzed by a trichloroniobium complex with a redox active α-diimine ligand

By Nishiyama, Haruka et al

From Chemical Communications (Cambridge, United Kingdom), 55(50), 7247-7250; 2019

78. Single Step



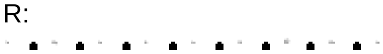
86%

Overview

Steps/Stages

1.1 R:

R:



R:

24 h, rt

Notes

Reactants: 1, Reagents: 3, Steps: 1, Stages: 1, Most stages in any one step: 1

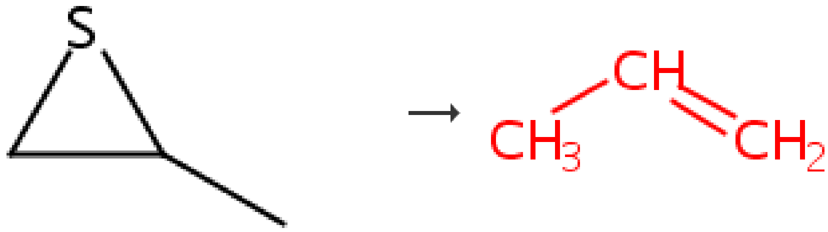
References

Oxidation catalyst and manufacturing method, and production method of unsaturated aldehyde or unsaturated nitrile using the oxidation catalyst with high yield and suppressed production of byproducts

By Yoshida, Atsushi et al

From Jpn. Kokai Tokkyo Koho, 2015188801, 02 Nov 2015

79. Single Step



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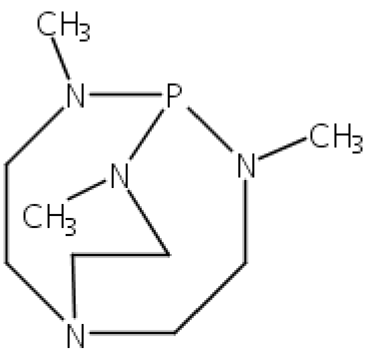
Overview

Steps/Stages

1.1 R:



S:Benzene

Notes

Reactants: 1, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

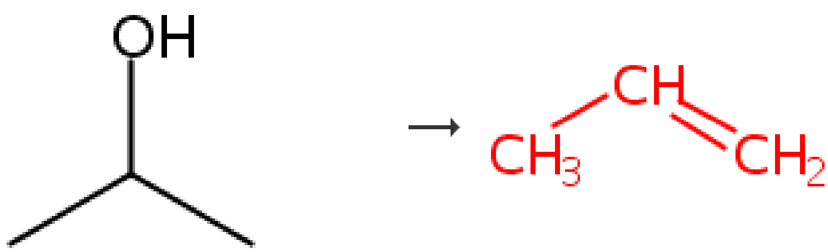
References

P(MeNCH2CH2)3N: an efficient desulfurizing reagent

By Yu, Zhengkun and Verkade, John G.

From Heteroatom Chemistry, 10(7), 544-547; 1999

80. Single Step



100%

Overview

Steps/Stages

1.1 C:1763-23-1

Notes

Reactants: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

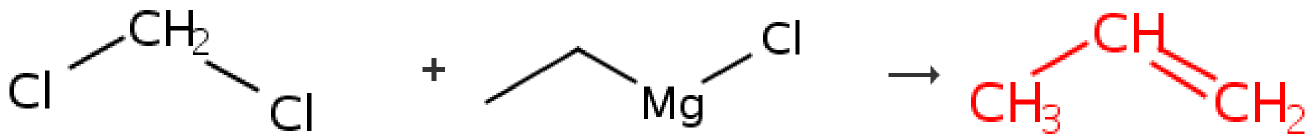
References

Preparation of alkenes from alcohols with solid super acid POSA as catalyst

By Fu, Xiangkai et al

From Yingyong Huaxue, 7(2), 83-5; 1990

81. Single Step



84%

Overview

Steps/Stages

1.1 C:1409945-74-9, S:THF, 5 min, rt

Notes

Reactants: 2, Catalysts: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

A Novel Iron Complex for Cross-Coupling Reactions of Multiple C-Cl Bonds in Polychlorinated Solvents with Grignard Reagents

By Gartia, Yashraj et al

From Catalysis Letters, 142(11), 1397-1404; 2012

Experimental Procedure

General/Typical Procedure: 2.3 Cross-Coupling of CH_2Cl_2 with Butylmagnesium Chloride Cross-coupling reactions were performed according to the following general method. Catalyst **2** (0.5 mg, 0.87 µmol) in 0.5 mL THF was taken in a 5 mL round bottom flask (purged with N_2), and to this solution 2 M *n*-butylmagnesium chloride solution in THF (0.42 mL, 0.84 mmol) was added. To the reaction mixture (27 µL, 0.42 mmol) of CH_2Cl_2 in 2 mL THF was added slowly using a syringe pump at the rate of 24 mL/h. After 5 min, the reaction was completely stopped by destroying the excess Grignard reagent using methanol, and the reaction products were analyzed using GC-MS technique. An internal standard decane was used to quantify the product formed. Yield 84%

Reaction Protocol

Procedure 1. Take the iron (III) complex (0.5 mg, 0.87 µmol) in 0.5 mL of THF in a 5 mL round bottomed flask (purge with N_2).
2. Add 2 M ethylmagnesium chloride solution in THF (0.42 mL, 0.84 mmol) to the solution.

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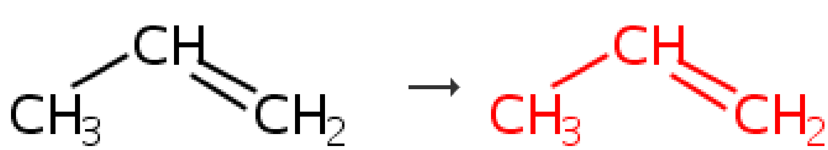
82. Single Step



85%

Overview

Steps/Stages

1.1 C:877880-34-7, S:PhMe, 4 h, 25°C, 10 atm

1.2 R:HCl, S:H_2O, rt

Notes

optimized on cocatalyst, temperature and pressure for yield, methylaluminumoxide used as cocatalyst, optimization study, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Bis(1,3-di-tert-butylimidazolin-2-iminato) titanium complexes as effective catalysts for the monodisperse polymerization of propylene

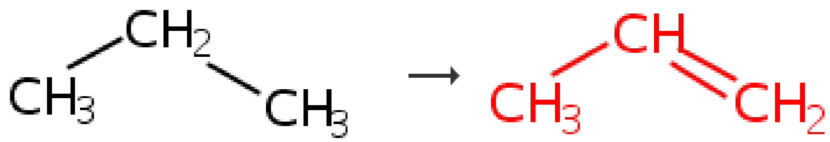
By Sharma, Manab et al

From Journal of the American Chemical Society, 134(41), 17234-17244; 2012

Experimental Procedure

5.2. Propylene Polymerization Experiments. The polymerizations were performed in a 100 mL stainless steel reactor equipped with a magnetic stirrer. The reactor was charged with a certain amount of complex cocatalyst and solvent (toluene) inside a glovebox and then connected to a high-vacuum line; the reactor was frozen at liquid nitrogen temperature, and liquid propylene was transferred to the frozen reactor. The temperature was then raised using a fan and kept constant via a thermostat water bath. The pressure in the reactor was measured and followed with a digital manometer. After the reaction stirred for the allotted period of time, it was quenched by opening of the reaction vessel in a well-ventilated hood and addition of 50 mL of 10% HCl in methanol. The polymer was filtered, washed with methanol and acetone, and dried in a vacuum oven at 60 °C. NMR measurements were taken in a solution of TCE at 80 °C. Polypropylene, yield 85%.

83. Single Step



91%

Overview

Steps/Stages

1.1 R:O_2, C:13566-08-0 vanadium and samarium excess derivs., 350°C, 1 atm

Notes

gas phase, optimized on reaction temp. and catalyst, catalyst is 12mol% V/SmVO4, helium carrier gas used, Reactants: 1, Reagents: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

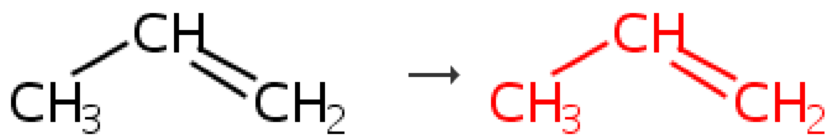
References

Vanadium species: Sm-V-O catalytic system for oxidative dehydrogenation of propane

By Barbero, Bibiana P. and Cadus, Luis E.

From Applied Catalysis, A: General, 244(2), 235-249; 2003

84. Single Step



92%

Overview

Steps/Stages

1.1 R:H_2, rt → 70°C, 25 psi

1.2 C:*i*-$Bu_2AlO(2,6$-*t*-Bu-4-$MeC_6H_2)$, C:168704-96-9, C:240136-04-3, S:PhMe, 15 min, 70°C

1.3 R:Me_2CHOH

Notes

Parr reactor used, product yield depends on catalyst/activator ratios, mixed alkanes (mixture of hydrogenated propylene oligomers mostly C6-C12 isoalkanes) solvent used (stage 1), Reactants: 1, Reagents: 2, Catalysts: 3, Solvents: 1, Steps: 1, Stages: 3, Most stages in any one step: 3

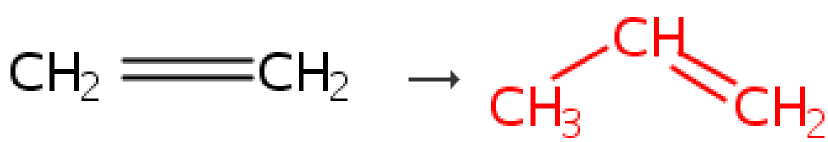
References

Mixture of fluoroarylaluminum and aryloxyaluminum catalyst activator composition for olefin polymerization

By Chen, Eugene Y. et al

From PCT Int. Appl., 2000009514, 24 Feb 2000

85. Single Step



80%

Overview

Steps/Stages

1.1 C:SiO_2, C:Al_2O_3, C:H_3PO_4, C:H_3BO_3, 20 min, 350°C, 0.1 MPa

1.2 R:H_2, 5 min, 500°C, 0.1 MPa

Notes

low pressure, catalyst prepared and used, reaction as described by the author, fixed bed reactor used, selectivity, 89%, conversion, 90%, zeolite used, Reactants: 1, Reagents: 1, Catalysts: 4, Steps: 1, Stages: 2, Most stages in any one step: 2

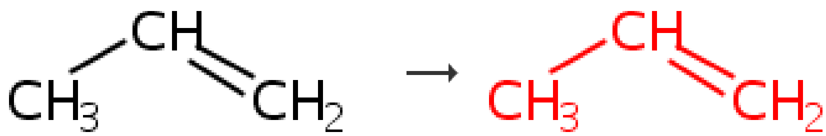
References

Zeolite molded body, its manufacture, and its use as fluidized-bed reaction catalyst for manufacture of propylene

By Ito, Mitsuetsu and Yamaguchi, Masashi

From Jpn. Kokai Tokkyo Koho, 2016175038, 06 Oct 2016

86. Single Step



hexadecylbicycloheptenyl ethanone-function → norbornene-terminated and norbornene polym

82%

Overview

Steps/Stages

1.1 C:7642-09-3, C:918870-76-5, S:PhMe, 16 h, rt

Notes

scintillation vial used, glovebox used, capped flask used, Reactants: 1, Catalysts: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

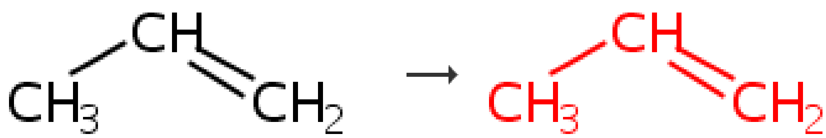
References

Preparation of bottlebrush polymers via ring-opening metathesis polymerization

By Stewart, Ian C. and Harris, David T.

From U.S. Pat. Appl. Publ., 20140213732, 31 Jul 2014

87. Single Step



88%

Overview

Steps/Stages

1.1 C:699011-56-8, C:134366-83-9, S:PhMe, 12 h, 25°C, 100 kPa

1.2 R:HCl, S:MeOH, 25°C

Notes

alternative preparation shown, low pressure, Reactants: 1, Reagents: 1, Catalysts: 2, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

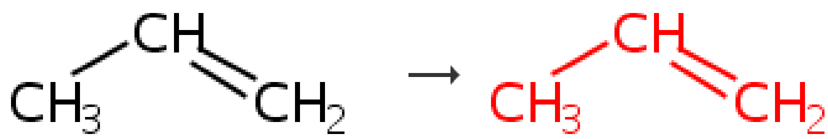
References

Triphenylcarbenium salts of Group 13 fluoroaryl complexes as cocatalysts for the polymerization of monomers

By Chen, Ming-Chou and Marks, Tobin J.

From PCT Int. Appl., 2004048388, 10 Jun 2004

88. Single Step



88%

Overview

Steps/Stages

1.1 C:699011-55-7, C:134366-83-9, S:PhMe, 5 h, 25°C, 100 kPa

1.2 R:HCl, S:MeOH, 25°C

Notes

alternative preparation shown, low pressure, Reactants: 1, Reagents: 1, Catalysts: 2, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

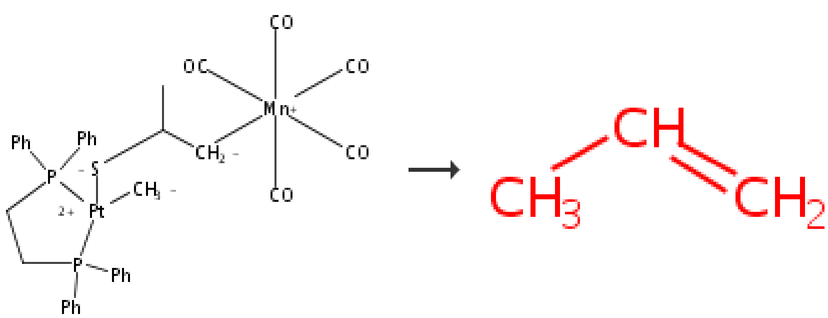
References

Triphenylcarbenium salts of Group 13 fluoroaryl complexes as cocatalysts for the polymerization of monomers

By Chen, Ming-Chou and Marks, Tobin J.

From PCT Int. Appl., 2004048388, 10 Jun 2004

89. Single Step



91%

Overview

Steps/Stages

Notes

1.1 S:PhMe

thermal, Reactants: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Regio- and Stereoselective Insertion Reactions of Thiiranes into Pt-Mn (or Re) Bond in Organoplatinum-Manganese or -Rhenium Heterodinuclear Complexes as Intermediates toward Desulfurization Reaction

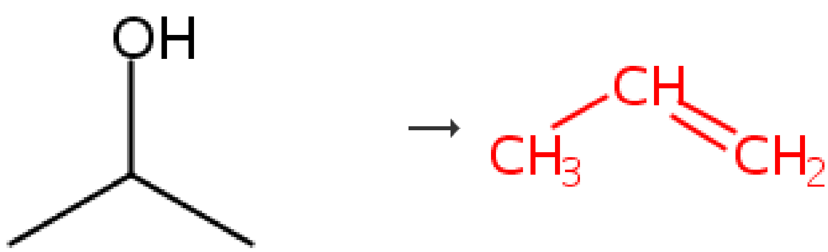
By Komiya, Sanshiro et al

From Journal of the American Chemical Society, 122(1), 170-171; 2000

Experimental Procedure

Namely, heating of **4** at 80 °C in toluene exclusively liberated propylene in 91 % yields.[11]

90. Single Step



99%

Overview

Steps/Stages

1.1

Notes

Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

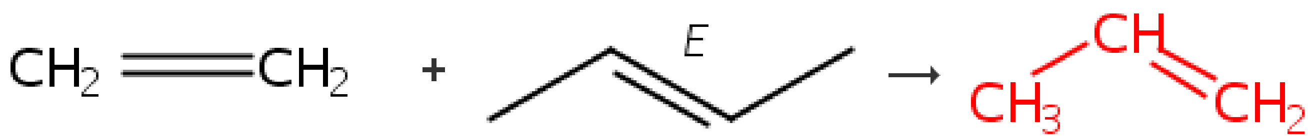
References

Porous structure of a γ-aluminum oxide-aluminum cermet and its activity and selectivity in dehydration of isopropanol

By Anan'in, V. N. and Trokhimets, A. I.

From Doklady Akademii Nauk BSSR, 31(1), 66-9; 1987

91. Single Step



79%

Overview

Steps/Stages

1.1 C:WO_3, C:SiO_2, 1 h, 550°C; 550°C → rt

Notes

cat. pre-prepared, Reactants: 2, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Entrapped Single Tungstate Site in Zeolite for Cooperative Catalysis of Olefin Metathesis with Bronsted Acid Site

By Zhao, Pu et al

From Journal of the American Chemical Society, 140(21), 6661-6667; 2018

Reaction Protocol

Procedure 1. Carry out the reaction between ethene (C_2=) and trans-2-butene (trans-2-C_4=) in a stainless steel continuous flow reactor (3/8 inch inner diameter and 15 inch length).
2. Load 2.1 g of catalyst (15-20 cm length) into the reactor with quartz wool packed at both ends.

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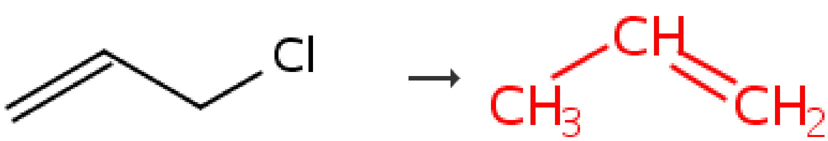
92. Single Step



85%

Overview

Steps/Stages

1.1 R:Naphthalene, R:Na, S:THF, 20 min, -78°C
1.2 S:THF, -78°C; 1 h, -78°C
1.3 R:H_2O, 5 min, -78°C; overnight, -78°C → rt

Notes

Reactants: 1, Reagents: 3, Solvents: 1, Steps: 1, Stages: 3, Most stages in any one step: 3

References

Polymer supported naphthalene-catalyzed sodium reactions

By van den Ancker, Tania R. and Love, Cameron J.

From Organic & Biomolecular Chemistry, 5(21), 3520-3523; 2007

Reaction Protocol

Procedure 1. Stir a yellow-green suspension of sodium powder (0.44 g, 19.0 mmol) and polymer-supported naphthalene (0.4-8.0 mmol) in THF (60 mL) for 20 minutes at -78 °C.
2. Add slowly allyl chloride (8.0 mmol) in THF (40 mL) to the mixture.

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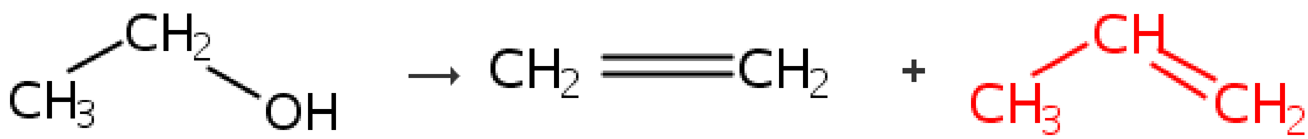
93. Single Step



96%

Overview

Steps/Stages

1.1 C:ZrO_2, C:SiO_2, S:H_2O, 4.8 s, 450°C, 1.11 MPa

Notes

high pressure, thermal, Reactants: 1, Catalysts: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

High Performance SiO2-ZrO2 Binary Oxide for Ethanol Conversion to Ethylene

By Xia, Wei et al

From Catalysis Letters, 148(10), 3024-3034; 2018

Reaction Protocol

Procedure 1. Add 0.72 g of SiO_2-ZrO2 Catalyst for 4.8 seconds in a fixed-bed reactor consisting of quartz tube (length = 28 cm, diameter = 1 cm) at 1.11 MPa.
2. Feed [ethanol (99.5%, Wako):H_2O:N_2 = 1:1:1] into the reactor by means of a micro pump.

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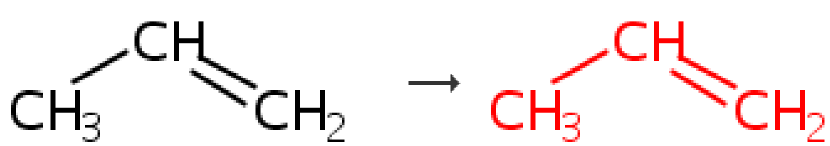
94. Single Step



78%

Overview

Steps/Stages

Notes

1.1 C:1804910-15-3, C:120144-90-3, S:PhMe, 1 h, 30°C, 5 bar

1.2 R:HCl, S:H_2O, S:EtOH, acidify

catalyst prepared and used, pressure reactor used, optimization study, optimized on catalyst, optimized on temperature, optimized on time, optimized on stoichiometry of solvent, Reactants: 1, Reagents: 1, Catalysts: 2, Solvents: 3, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Polymerization of ethylene and propylene promoted by group 4 metal complexes bearing thioetherphenolate ligands

By Luciano, Ermanno et al

From Polymer Chemistry, 6(25), 4657-4668; 2015

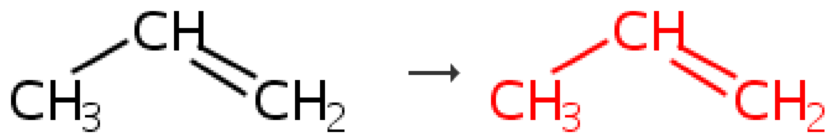
Reaction Protocol

Procedure
1. Charge a toluene solution of methylaluminoxane into the reactor.
2. Equilibrate with a monomer gas feed for an hour at 30 °C under stirring.

View more...

View with MethodsNow

95. Single Step



79%

Overview

Steps/Stages

1.1 R:H_2, C:132510-07-7, C:120144-90-3

Notes

Reactants: 1, Reagents: 1, Catalysts: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

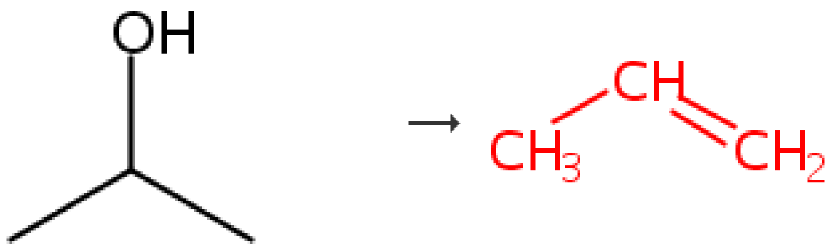
References

Protective sheets having olefin lubricant-containing outermost layers for solar cells, back sheets therefrom, and solar cell modules using them

By Ozawa, Makoto et al

From Jpn. Kokai Tokkyo Koho, 2015037171, 23 Feb 2015

96. Single Step



82%

Overview

Steps/Stages

1.1 R:O_2, C:1204576-20-4, 1 h, 973K

1.2 R:H_2, 2 h, 873K

1.3 473-523K

Notes

thermal, Reactants: 1, Reagents: 2, Catalysts: 1, Steps: 1, Stages: 3, Most stages in any one step: 3

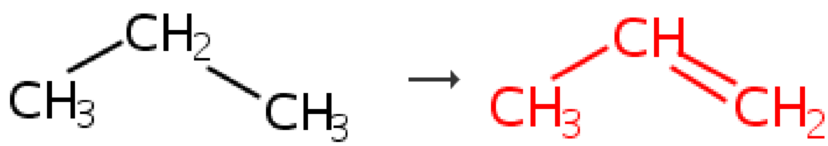
References

Catalytic properties of complex hydride systems based on alloys of Zr with V and Mo in processes for oxidative dehydrogenation of alcohols

By Alieva, A. M. et al

From Kimya Problemlari, (4), 719-721; 2007

97. Single Step



84%

Overview

Steps/Stages

1.1 R:O_2, C:13566-08-0 vanadium and samarium excess derivs., 350°C, 1 atm

Notes

gas phase, optimized on reaction temp., catalyst is 8mol% V/SmVO4, helium carrier gas used, Reactants: 1, Reagents: 1, Catalysts: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

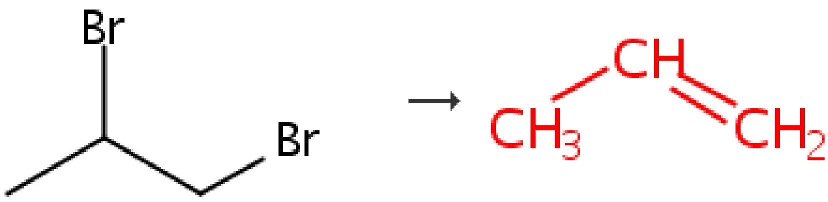
References

Vanadium species: Sm-V-O catalytic system for oxidative dehydrogenation of propane

By Barbero, Bibiana P. and Cadus, Luis E.

From Applied Catalysis, A: General, 244(2), 235-249; 2003

98. Single Step



97%

Overview

Steps/Stages

1.1

Notes

Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

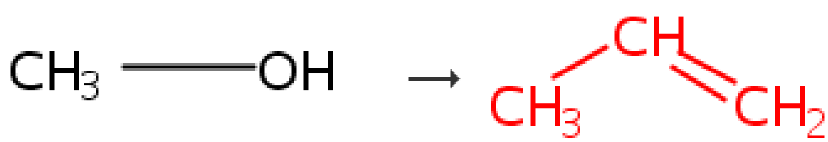
References

Dehalogenation of organic halides using phase-transfer catalysts. I. Dehalogenation of halogen derivatives of ethane

By Chukhadzhyan, G. A. et al

From Armyanskii Khimicheskii Zhurnal, 34(10), 866-71; 1981

99. Single Step



74%

Overview

Steps/Stages

1.1 R:O_2, 96 h, 450°C, 0.13 MPa; 8 h, 460°C, 0.16 MPa; 72 h, 455°C, 0.13 MPa; 4 h, 460°C, 0.16 MPa; 48 h, 460°C, 0.13 MPa; 435°C, 0.4 MPa

Notes

unspecified catalyst used, ZSM-5 supported used, optimization study, optimized on catalyst and time, low pressure, solid-supported catalyst, thermal, Reactants: 1, Reagents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

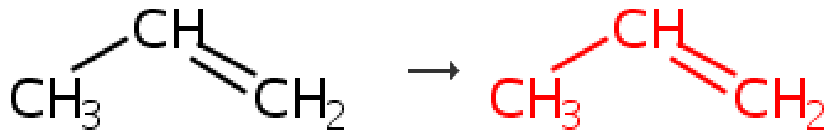
References

Methanol conversion method using cascade-stage moving bed apparatus

By Li, Minggang et al

From Faming Zhuanli Shenqing, 108329186, 27 Jul 2018

100. Single Step



75%

Overview

Steps/Stages

1.1 C:149342-08-5, C:Al(*i*-Bu)$_3$, S:PhMe, 60 min, 60°C, 2 bar

Notes

methylaluminoxane used as catalyst, Schlenk flask used, rac-SiMe,(2-Me-Ind);ZrCl supported on PBS-50 or Argel 55 used as catalyst, solid-supported catalyst, Reactants: 1, Catalysts: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Influence of polypropylene reaction time on the clay exfoliation process by in situ polymerization

By Marques, Maria De Fatima V. and Fernandes, Rodrigo Moreira

From Journal of Nanoscience and Nanotechnology, 17(7), 5059-5067; 2017