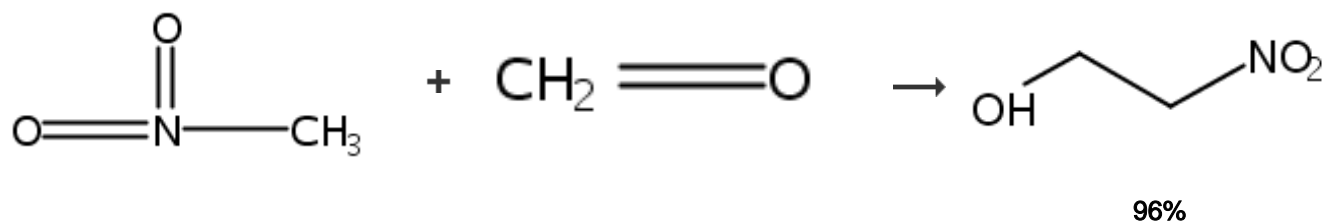


1. Single Step

[Overview](#)

Steps/Stages

1.1 R:K₂CO₃, S:EtOH, 3 h, reflux

Notes

paraformaldehyde used, reactant also recovered as product, Reactants: 2, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

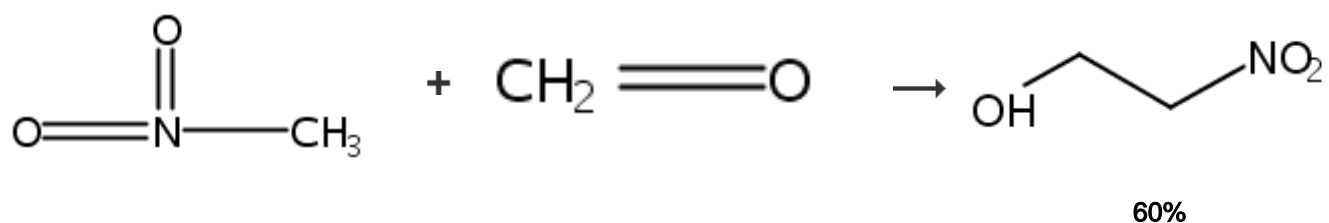
[Process for preparation of taurine and bicarbonate](#)

By Sun, Huajun et al

From Faming Zhuanli Shenqing, 105693559, 22 Jun 2016

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

2. Single Step

[Overview](#)

Steps/Stages

1.1 R:KOH, S:MeNO₂, S:H₂O, 2 h, rt; 30 min, 100°C; 100°C → rt

Notes

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

References

[Organocatalytic Enantioselective Formal C\(sp²\)-H Alkylation](#)

By Manna, Madhu Sudan and Mukherjee, Santanu

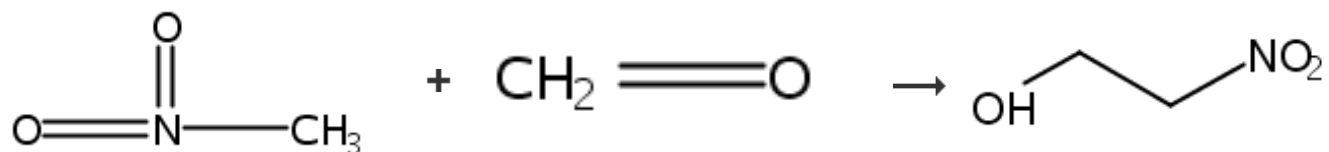
From Journal of the American Chemical Society, 137(1), 130-133; 2015

[Experimental Procedure](#)

Preparation of 2-nitroethan-1-ol (2j): In an oven-dried round-bottom flask, equipped with reflux condenser, paraformaldehyde (500 mg, 16.65 mmol, 1.0 equiv.) was taken with 75.0 mL of nitromethane. To this was added 0.15 mL 3.0 M methanolic KOH solution and the mixture was stirred at r.t. for 2 h and then refluxed at 100 °C for additional 30 min. After cooling the reaction mixture to r.t., solvent was removed under reduced pressure and the residue was purified by silica-gel column chromatography (20-25% EtOAc in petroleum ether). **2j** as a light yellow oil (910 mg, 1.00 mmol, 60% yield). **FT-IR (Thin film):** 2921 (w), 1637 (m), 1402 (w), 1261 (m); **¹H-NMR (400 MHz, CDCl₃):** δ 4.51 (t, J = 4.7 Hz, 2H), 4.12-4.10 (m, 2H), 2.93 (br s, 1H); **¹³C-NMR (100 MHz, CDCl₃):** δ 77.2, 58.7.

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

3. Single Step



Overview

Steps/Stages

1.1 R:NaOH, S:MeOH, 5 h, rt; 2 h, reflux

Notes

paraformaldehyde used, Reactants: 2, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

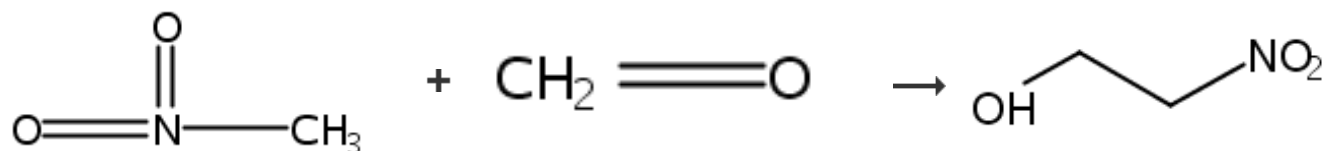
[A process for preparing taurine](#)

By Sun, Huajun et al

From Faming Zhuanli Shenqing, 103613517, 05 Mar 2014

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

4. Single Step



44%

Overview

Steps/Stages

1.1 R:KOH, S:MeOH

Notes

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

References

[Asymmetric synthesis of aphanorphine and synthetic approaches towards dietyoxetane](#)

By Welsh, Emma Jane

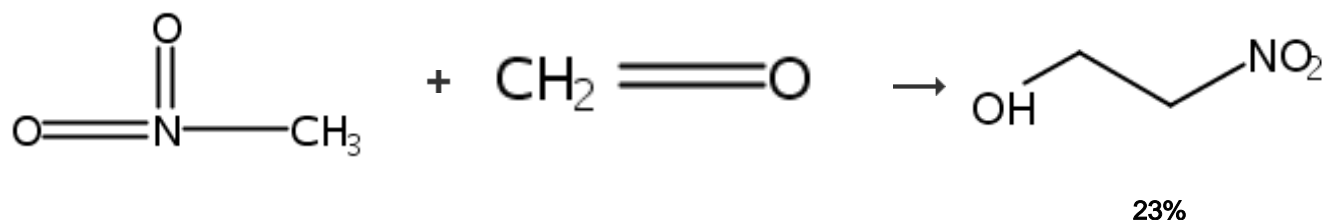
From null, , No pp.; 2007

Experimental Procedure

The crude nitroethanol 533 (518 was author's error): A three necked round bottomed flask was equipped with a dropping funnel, thermometer and a condenser. Paraformaldehyde (18.0 g, 0.6 mol) and freshly distilled nitromethane (340 mL, 6.7 mol) were added to the flask and the mixture was stirred vigorously. KOH (3 M in MeOH, Ca. 1.5 mL) was added dropwise through the dropping funnel until pH 8 was reached (litmus paper). The mixture became homogenous after 20 min and the solution was stirred at rt for 1 hr. Conc. H₂SO₄ was added until the solution reached pH 4 and the solution was stirred at rt overnight. The reaction mixture was subjected to vacuum filtration and the filtrate (66 g) was added to a flask containing diphenyl ether (66 g). The solution was distilled under reduced pressure (0.8 mbar). The first fraction to distil contained unreacted nitromethane (bp 24 degC), the second fraction contained nitroethanol and diphenyl ether (bp 84 degC). The second fraction was biphasic and the lower layer was removed and washed with hexane (30 mL). The lower layer was separated to afford nitroethanol (23.88 g, 44 %) and was used without further purification.

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

5. Single Step



Overview

Steps/Stages

1.1 S:H₂O

Notes

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

References

[Studies towards the total synthesis of \(-\)-mitragynine using solid-supported reagents](#)

By Henry, D. J.

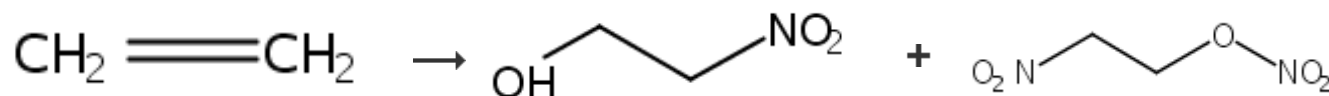
From null, , No pp.; 2003

Experimental Procedure

2-Nitroethanol 90: Formaldehyde (67 % aqueous solution) (10 mL, 193 mmol) was added to a suspension of polymer-supported hydroxide (95 g, 285 mmol) in nitromethane (200 mL) and the reaction mixture stirred at rt for 10 min. The mixture was filtered, the beads washed extensively with nitromethane (3 x 100 mL) and CH₂Cl₂ (5 x 100 mL) and the solvent then removed in vacuo. The resultant yellow oil was redissolved in CH₂Cl₂ (100 mL), dried (MgSO₄) and the solvent removed in vacuo to afford 2-nitroethanol 90 as a yellow oil (3.96 g, 23 %).

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

6. Single Step



Overview

Steps/Stages

Notes

1.1

Go to Science of Synthesis, a critically reviewed reference work of synthetic methodology, for more information., Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

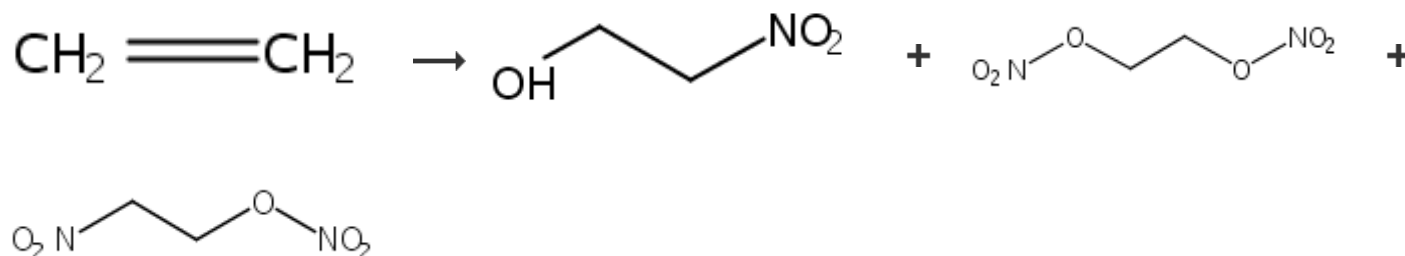
References

[Product class 1: Synthesis of nitroalkanes](#)

By Aitken, R. A. and Aitken, K. M.

From Science of Synthesis, 41, 9-258; 2010

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

7. Single Step

[Overview](#)

Steps/Stages

1.1

Notes

Go to Science of Synthesis, a critically reviewed reference work of synthetic methodology, for more information., Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

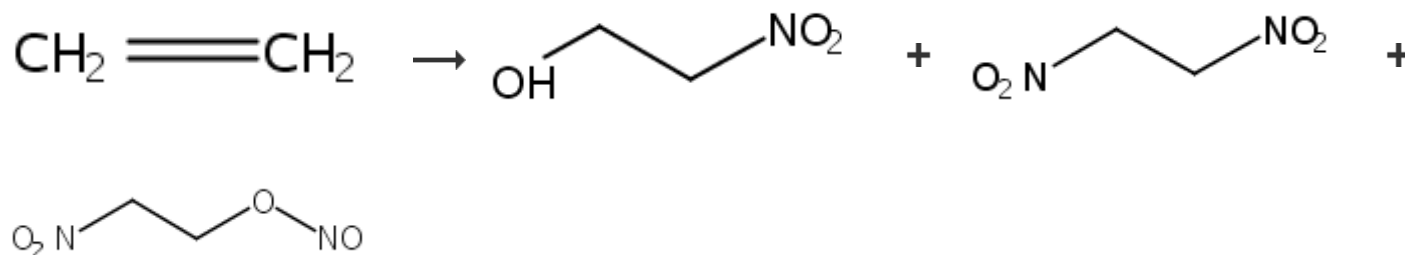
References

[Product class 1: Synthesis of nitroalkanes](#)

By Aitken, R. A. and Aitken, K. M.

From Science of Synthesis, 41, 9-258; 2010

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

8. Single Step

[Overview](#)

Steps/Stages**Notes**

1.1

Go to Science of Synthesis, a critically reviewed reference work of synthetic methodology, for more information.,
Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

[Product class 1: Synthesis of nitroalkanes](#)

By Aitken, R. A. and Aitken, K. M.

From Science of Synthesis, 41, 9-258; 2010

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

9. Single Step[Overview](#)**Steps/Stages**

1.1

Notes

Go to Science of Synthesis, a critically reviewed reference work of synthetic methodology, for more information.,
Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

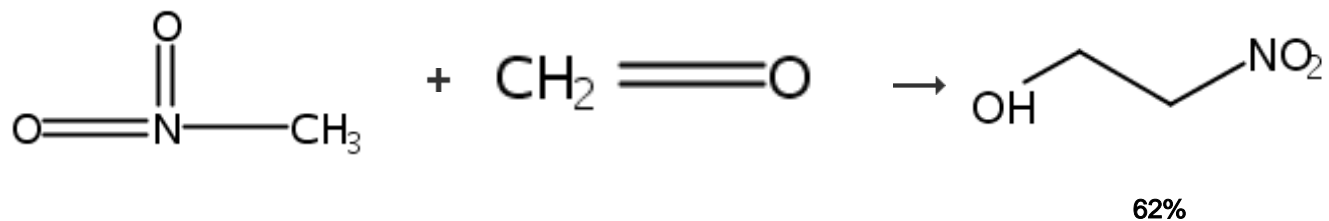
References

[Product class 1: Synthesis of nitroalkanes](#)

By Aitken, R. A. and Aitken, K. M.

From Science of Synthesis, 41, 9-258; 2010

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

10. Single Step[Overview](#)**Steps/Stages****Notes**

1.1 R:NaF, S:Me₂CHOH, 20 h, 40°C

paraformaldehyde used, Reactants: 2,
Reagents: 1, Solvents: 1, Steps: 1, Stages: 1,
Most stages in any one step: 1

References

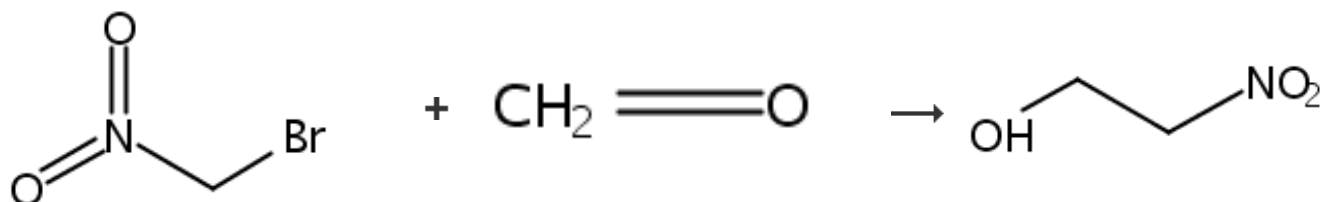
[Method for synthesis of Florfenicol intermediate \(1R,2R\)-2-amino-1-\(4-\(methylsulphonyl\)phenyl\)-1,3-propanediol](#)

By Peng, Yaowu et al

From Faming Zhuanli Shenqing, 101941927, 12 Jan 2011

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

11. Single Step



Overview

Steps/Stages

- 1.1 R:In, S:THF, 20 min
- 1.2 S:H₂O, 4 h
- 1.3 R:NaHCO₃, S:H₂O

Notes

ultrasound, regioselective, paraformaldehyde used, Reformatsky reaction, Reactants: 2, Reagents: 2, Solvents: 2, Steps: 1, Stages: 3, Most stages in any one step: 3

References

[Convenient procedure for the indium-mediated hydroxymethylation of active bromo compounds: transformation of ketones into α-hydroxymethyl nitroalkanes](#)

By Soengas, Raquel G. and Estevez, Amalia M.

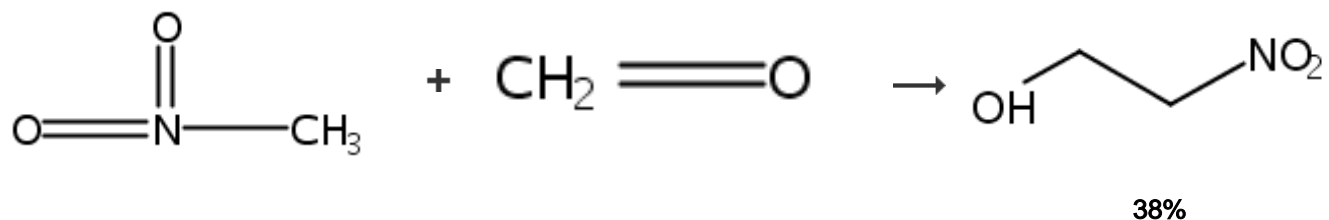
From Synlett, (17), 2625-2627; 2010

Experimental Procedure

General Procedure for the hydroxymethylation of 2-bromonitroalkanes: To a suspension of indium powder (0.5 mmol) in THF (1 mL), bromonitroalkane (0.75 mmol) was added and the mixture was sonicated for 20 min. Paraformaldehyde (0.5 mmol) was then added and sonication continued for further 4 h. The reaction mixture was neutralized with saturated aqueous sodium hydrogen carbonate, diluted with water (10 mL) and extracted with ether (3 x 25 mL). The combined organic layers were dried over magnesium sulphate, filtered and the solvent was evaporated in vacuo to obtain pure compounds shown in Table 4. Nitroethanol, clear oil, yield 31.3 mg, 69%. ¹H-NMR (CDCl₃, ppm): 3.72-3.76 (m, 2H); 4.18-4.34 (m, 2H). ¹³C NMR (CDCl₃, ppm): 59.8 (C-1); 78.5 (C-2).

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

12. Single Step



Overview

Steps/Stages

1.1 C:PhCH₂N+Me₃ •OH⁻, S:H₂O, S:MeOH, 66 h, rt

Notes

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

References

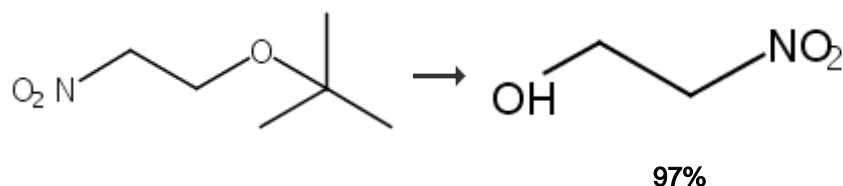
[Solvent effect on the reversibility of base catalyzed Henry reactions - Triton B catalyzed nitro aldol reactions in alcohol](#)

By Ono, Fumiyasu et al

From Sogo Rikogaku Hokoku (Kyushu Daigaku Daigakuin), 30(1), 25-28; 2008

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

13. Single Step



Overview

Steps/Stages

1.1 R:CeCl₃, R:NaI, S:MeCN, 32 h, 70°C

Notes

chemoselective, optimization study, Reactants: 1, Reagents: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

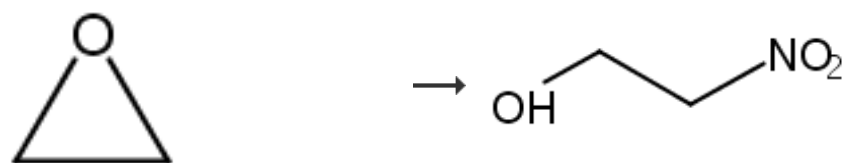
[tert-Butyl ethers: renaissance of an alcohol protecting group. Facile cleavage with Cerium\(III\) chloride/sodium iodide](#)

By Bartoli, Giuseppe et al

From Advanced Synthesis & Catalysis, 348(7+8), 905-910; 2006

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

14. Single Step



Overview

Steps/Stages

1.1 R:NaNO₂, C:10025-84-0, C:Bu₄N⁺•Br⁻, S:H₂O, S:Et₂O, 6 h, -5°C

Notes

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

References

[LaCl₃·7H₂O-promoted regioselective ring opening of epoxides using NaNO₂ in ether-water system. A facile synthesis of 2-nitroalcohols](#)

By Borah, Jagat C. et al

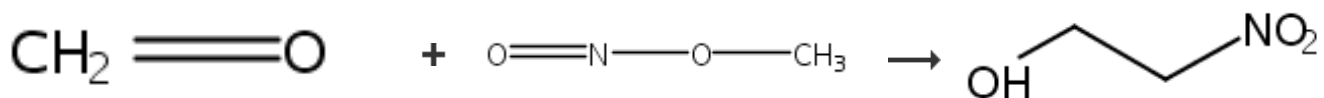
From Synthetic Communications, 35(6), 873-878; 2005

Experimental Procedure

General Procedure for the Ring Opening of Epoxides A mixture of the epoxide (3.05 mmol), NaNO₂ (1.68 g, 24.4 mmol), LaCl₃·bul.7H₂O (2.27 g, 6.11 mmol), and Bu₄NBr (0.2 g, 0.62 mmol) in ether: water (1:1) system was vigorously stirred at room temperature. The progress of the reaction was monitored by TLC. After completion of the reaction, the reaction mixture was extracted with ether, dried over anhydrous Na₂SO₄ and concentrated. The crude product was purified by preparative TLC using 1 : 5 ethyl acetate: hexane. **Table 1**, Entry 1, yield 78%.

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

15. Single Step



Overview

Steps/Stages

1.1

Notes

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

References

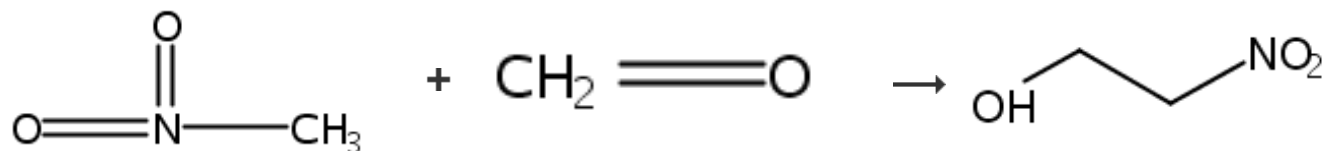
[Nitroethylene: a stable, clean, and reactive agent for organic synthesis](#)

By Ranganathan, Darshan et al

From Journal of Organic Chemistry, 45(7), 1185-9; 1980

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

16. Single Step



49%

[Overview](#)**Steps/Stages**1.1 R:KOH, S:H₂O, S:MeNO₂**Notes**

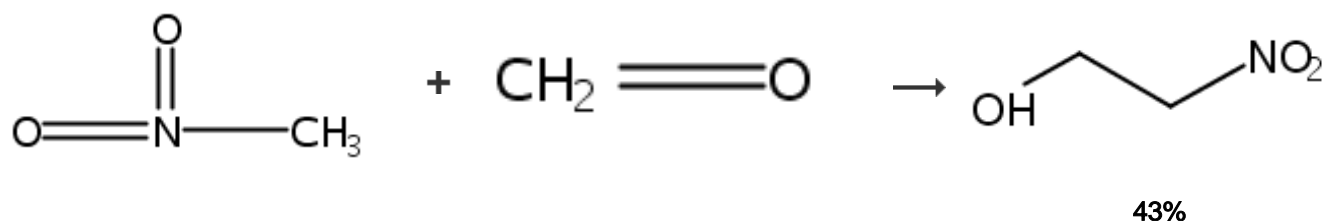
Paraformaldehyde, KOH/MeOH, MeNO₂, r.t./1 h., Hydroxymethylation, Reactants: 2, Reagents: 1, Solvents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

References[2-Nitroethanol](#)

By Noland, Wayland E.

From Organic Syntheses, 41, 67-72; 1961

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

17. Single Step[Overview](#)**Steps/Stages**1.1 R:K₂CO₃, S:H₂O**Notes**

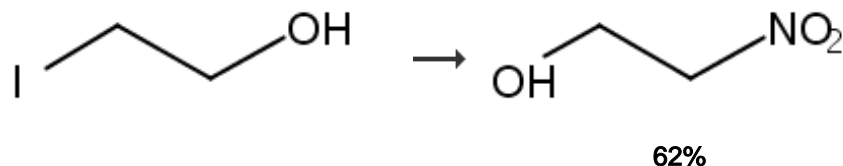
Classification: C-Alkylation; # Conditions: K₂CO₃ H₂O; 3h Rf, Reactants: 2, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References[Nitroethylene](#)

By Hopff, H. and Capaul, M.

From Helvetica Chimica Acta, 43, 1898-910; 1960

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.

18. Single Step[Overview](#)**Steps/Stages****Notes**

1.1 R:AgNO₂, S:Et₂O

Classification: Substitution; C-Nitration; #
Conditions: AgNO₂ Et₂O; Rf 3h, Reactants: 1,
Reagents: 1, Solvents: 1, Steps: 1, Stages: 1,
Most stages in any one step: 1

References

[The nitroethylation of indole. A new synthesis of tryptamine](#)

By Noland, Wayland E. and Hartman, Philip J.

From Journal of the American Chemical Society, 76, 3227-8; 1954

CASREACT®: Copyright © 2017 American Chemical Society. All Rights Reserved. CASREACT contains reactions from CAS and from: ZIC/VINITI database (1974-1999) provided by InfoChem; INPI data prior to 1986; Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich; organic reactions, portions copyright 1996-2006 John Wiley & Sons, Ltd., John Wiley and Sons, Inc., Organic Reactions Inc., and Organic Syntheses Inc. Reproduced under license. All Rights Reserved.