



A Publication
of Reliable Methods
for the Preparation
of Organic Compounds

Working with Hazardous Chemicals

The procedures in *Organic Syntheses* are intended for use only by persons with proper training in experimental organic chemistry. All hazardous materials should be handled using the standard procedures for work with chemicals described in references such as "Prudent Practices in the Laboratory" (The National Academies Press, Washington, D.C., 2011; the full text can be accessed free of charge at http://www.nap.edu/catalog.php?record_id=12654). All chemical waste should be disposed of in accordance with local regulations. For general guidelines for the management of chemical waste, see Chapter 8 of Prudent Practices.

In some articles in *Organic Syntheses*, chemical-specific hazards are highlighted in red "Caution Notes" within a procedure. It is important to recognize that the absence of a caution note does not imply that no significant hazards are associated with the chemicals involved in that procedure. Prior to performing a reaction, a thorough risk assessment should be carried out that includes a review of the potential hazards associated with each chemical and experimental operation on the scale that is planned for the procedure. Guidelines for carrying out a risk assessment and for analyzing the hazards associated with chemicals can be found in Chapter 4 of Prudent Practices.

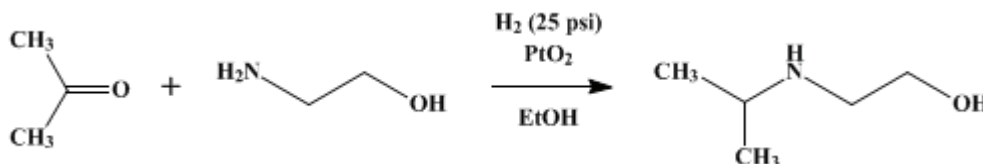
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These paragraphs were added in September 2014. The statements above do not supersede any specific hazard caution notes and safety instructions included in the procedure.

Organic Syntheses, Coll. Vol. 3, p.501 (1955); Vol. 26, p.38 (1946).

2-ISOPROPYLAMINOETHANOL

[Ethanol, 2-isopropylamino-]



Submitted by Evelyn M. Hancock and Arthur C. Cope.
Checked by Nathan L. Drake and Larry Green.

1. Procedure

The reaction is carried out in a catalytic hydrogenation apparatus similar to the one described by Adams and Voorhees.¹ In a 1-l. reduction bottle are placed 0.5 g. of platinum oxide catalyst¹ and 50 ml. of commercial absolute ethanol. The bottle is connected to a calibrated low-pressure hydrogen tank and alternately evacuated and filled with hydrogen twice. Hydrogen is then admitted to the system until the pressure is 1–2 atm. (15–30 lb.), and the bottle is shaken for 20–30 minutes to reduce the platinum oxide (Note 1). The shaker is stopped, air is admitted to the bottle, and a solution of 61.0 g. (1.0 mole) of ethanolamine (Note 2), 75.4 g. (94 ml., 1.3 moles) of acetone, and 100 ml. of absolute ethanol is rinsed into the reduction bottle with 50 ml. of absolute ethanol. The bottle is alternately evacuated and filled with hydrogen twice. Hydrogen is admitted to the system until the pressure is approximately 25 lb., and the bottle is shaken until the pressure drop indicates that the theoretical amount (1 mole) of hydrogen has been taken up and absorption ceases (6–10 hours). Air is admitted to the bottle, and the catalyst is removed by filtration through a Hirsch funnel with a filter plate of small diameter (Note 3). The bottle is rinsed with a total of 75 ml. of benzene, which is also poured through the funnel. The filtrate is rinsed into a 500-ml. modified Claisen flask with 25 ml. of benzene, and most of the solvent is distilled at atmospheric pressure. Distillation of the residue under reduced pressure yields 97–98 g. of 2-isopropylaminoethanol, b.p. 86–87°/23 mm. (94–95%, based on the ethanolamine used) (Note 4).

2. Notes

1. If hydrogenation of the reaction mixture is begun in the presence of platinum oxide, a long induction period or lag occurs before the catalyst is reduced.
2. Commercial ethanolamine (Carbide and Carbon Chemicals Corporation) was dried by distillation with a small amount of benzene and redistilled; b.p. 70–72°/12 mm.
3. The usual precaution was observed of keeping the catalyst wet with the solution being filtered to prevent ignition of the filter paper.
4. Similar procedures have been used in preparing other 2-alkylaminoethanols² and N-alkyl derivatives of 1-amino-2-propanol, 2-amino-1-propanol, 3-amino-1-propanol, 2-amino-1-butanol, and 1-amino-2-methyl-2-propanol.³

3. Discussion

2-Isopropylaminoethanol has been prepared by the reaction of isopropylamine with ethylene oxide,^{4,5} and by the method given above.²

This preparation is referenced from:

- *Org. Syn. Coll. Vol. 3, 470*

References and Notes

1. *Org. Syntheses Coll. Vol. 1*, 61, 463 (1941).
 2. Cope and Hancock, *J. Am. Chem. Soc.*, **64**, 1503 (1942).
 3. Cope and Hancock, *J. Am. Chem. Soc.*, **66**, 1453 (1944); Hancock and Cope, *J. Am. Chem. Soc.*, **66**, 1738 (1944); Hancock, Hardy, Heyl, Wright, and Cope, *J. Am. Chem. Soc.*, **66**, 1747 (1944).
 4. Matthes, *Ann.*, **315**, 104 (1901).
 5. Biel, *J. Am. Chem. Soc.*, **71**, 1306 (1949).
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Appendix Chemical Abstracts Nomenclature (Collective Index Number); (Registry Number)

ethanol (64-17-5)

Benzene (71-43-2)

hydrogen (1333-74-0)

platinum oxide

acetone (67-64-1)

Ethylene oxide (75-21-8)

ethanolamine (141-43-5)

2-isopropylaminoethanol,
Ethanol, 2-isopropylamino- (109-56-8)

1-amino-2-methyl-2-propanol (2854-16-2)

isopropylamine (75-31-0)

3-amino-1-propanol (156-87-6)

2-amino-1-butanol (13054-87-0)

1-amino-2-propanol (78-96-6)

2-amino-1-propanol (6168-72-5)