Organic Syntheses

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.

The procedures described in *Organic Syntheses* are provided as published and are conducted at one's own risk. *Organic Syntheses, Inc.*, its Editors, and its Board of Directors do not warrant or guarantee the safety of individuals using these procedures and hereby disclaim any liability for any injuries or damages claimed to have resulted from or related in any way to the procedures herein.

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.

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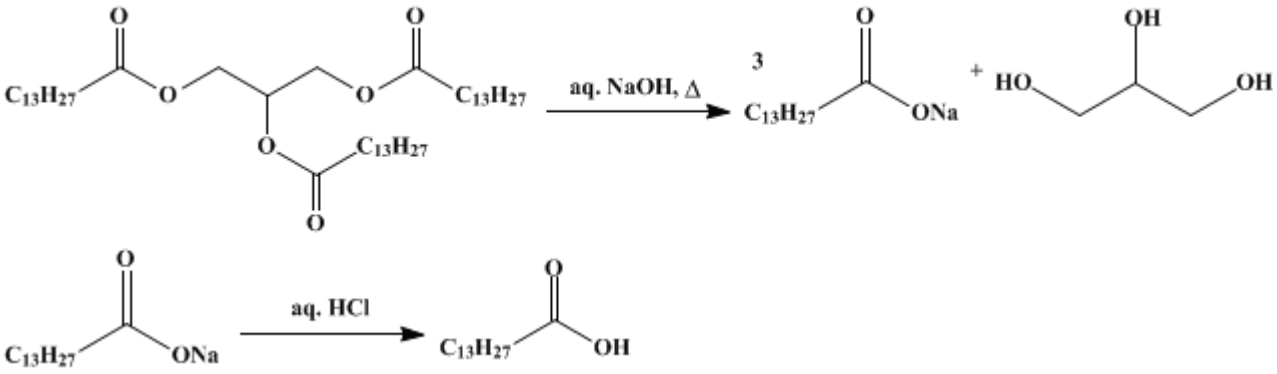
Organic Syntheses, Coll. Vol. 1, p.379 (1941); Vol. 6, p.66 (1926).

MYRISTIC ACID



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1. Procedure

In a 2-l. round-bottomed flask are placed 100 g. (0.14 mole) of pure (Note 1) trimyristin (p. 538) and 200 cc. of 10 per cent sodium hydroxide solution. The mixture is heated on a steam bath for two hours, with frequent shaking or stirring until the trimyristin has become emulsified. It is then diluted with 300 cc. of water and the heating is continued for another one-half hour, by which time the solution should be almost clear, indicating complete saponification. The solution is now poured with stirring into a hot solution of 650 cc. of water and 100 cc. of 20 per cent hydrochloric acid. The free acid which separates is not entirely clear, owing to the presence of unchanged sodium salt (Note 2). A gentle current of steam is passed into the hot mixture until the oily layer is transparent; this requires about fifteen minutes. The acid is allowed to cool and solidify; it is removed and freed of small quantities of salt and water by filtering through paper in a steam-jacketed funnel. The yield is 84–90 g. (89–95 per cent of the theoretical amount) of a colorless product (Note 3) which melts at 52–53° (Note 4).

2. Notes

1. If the trimyristin is not pure white and free of nutmeg oil, it will be necessary to purify the resulting acid by distillation under reduced pressure. It boils at 250°/100 mm. and 195°/15 mm.
2. As much as 15–20 g. of sodium salt may be found in the acid at this point if care is not taken to insure its decomposition. A corresponding amount of 35 per cent hydrochloric acid may be used. An excess of acid does no harm.
3. If desired, the acid may be recrystallized from petroleum ether (b.p., 40–60°) (F. H. Carr, private communication).
4. The melting point is not appreciably raised by recrystallization from petroleum ether. The highest melting point recorded in the literature is 53.8°.

3. Discussion

Myristic acid can be obtained by the hydrolysis of trimyristin contained in coconut oil,[1] nutmegs[2] (p. 538), or the seeds of *Virola venezuelensis*,[3] and by the hydrolysis of methyl myristate obtained from bayberry wax.[4]

This preparation is referenced from:

- Org. Syn. Coll. Vol. 3, 605

References and Notes

1. Gorgey, Ann. **66**, 314 (1848).
2. Krafft, Ber. **12**, 1668 (1879); Verkade and Coops, Rec. trav. chim. **46**, 528 (1927).
3. Thoms and Mannich, Ber. pharm. Ges. **11**, 263 (1901) [Chem. Zentr. II, 189 (1901)].
4. Org. Syn. **20**, 67.

Appendix
Chemical Abstracts Nomenclature (Collective Index Number); (Registry Number)

petroleum ether

hydrochloric acid (7647-01-0)

sodium hydroxide (1310-73-2)

Myristic acid (544-63-8)

trimyristin (555-45-3)

Methyl myristate (124-10-7)