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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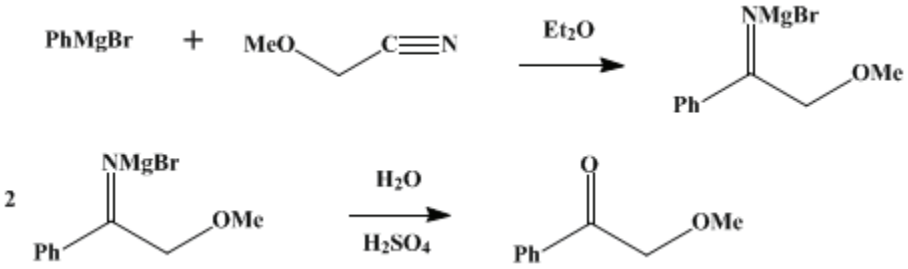
*Organic Syntheses, Coll. Vol. 3, p.562 (1955); Vol. 21, p.79 (1941).*

# ω-METHOXYACETOPHENONE

## [Acetophenone, ω-methoxy-]

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## 1. Procedure

A solution of phenylmagnesium bromide is prepared in a 2-l. three-necked flask, fitted with a separatory funnel, reflux condenser, and a mercury-sealed stirrer, from 8.8 g. (0.36 gram atom) of magnesium, 56.5 g. (38 ml., 0.36 mole) of bromobenzene, and a total of 350 ml. of dry ether by the procedure described in *Org. Syntheses* Coll. Vol. **1**, 226 (1941).

To the solution of the Grignard reagent, cooled by an ice-salt bath, a mixture of 21.3 g. (0.3 mole) of methoxyacetonitrile [*Org. Syntheses* Coll. Vol. **2**, 387 (1943)] and 50 ml. of dry ether is slowly added with stirring. The colorless addition product separates at once. After standing at room temperature for 2 hours, the mixture is again cooled and then decomposed by adding, with stirring, 500 ml. of water and cracked ice, and then 100 ml. of cold dilute sulfuric acid (Note 1). When the decomposition is complete (Note 2), the ether layer is separated and the aqueous layer is extracted with a little ether. This ether extract is combined with the ether layer, and the whole is washed with 5% aqueous sodium carbonate solution and then with water. The solution is dried with anhydrous sodium sulfate.

The ether is removed by distillation from a steam bath, and the residue is distilled under diminished pressure. ω-Methoxyacetophenone is a colorless liquid which boils at 118–120° /15 mm. or 228–230° /760 mm. (Note 3). The yield is 32–35 g. (71–78% based on the methoxyacetonitrile).

## 2. Notes

1. One volume of concentrated sulfuric acid is added to 2 volumes of water, and the mixture is cooled in an ice-salt bath.
2. The two layers should be light yellow in color with only a small amount of solid or tarry material present.
3. The checkers observed a boiling point of 110–112° /9 mm.

## 3. Discussion

The method described is essentially that of Pratt and Robinson.[1] ω-Methoxyacetophenone has also been prepared by chromic acid oxidation of α-phenyl-β-methoxyethanol, which in turn was prepared from styrene oxide.[2]

## References and Notes

1. Pratt and Robinson, *J. Chem. Soc.*, **1923**, 748.
2. Kaelin, *Helv. Chim. Acta*, **30**, 2132 (1947).

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

sulfuric acid (7664-93-9)

ether (60-29-7)

magnesium (7439-95-4)

sodium carbonate (497-19-8)

sodium sulfate (7757-82-6)

chromic acid (7738-94-5)

bromobenzene (108-86-1)

Phenylmagnesium bromide (100-58-3)

Styrene oxide (96-09-3)

Methoxyacetonitrile (1738-36-9)

ω-Methoxyacetophenone,
Acetophenone, ω-methoxy- (4079-52-1)

α-phenyl-β-methoxyethanol