Acetic Anhydride

Product Specification

Acetic anhydride is an acylation reagent. Acylation reduces the polarity of amino, hydroxy, and thiol groups. Acylation may improve the stability of a compound by protecting unstable groups, and may increase volatility. Acetic anhydride can be used with a basic catalyst, such as pyridine. This combination promotes smooth reactions and has great solvent power. Pyridine acts as an acceptor for the acid by-product formed in the reaction. Pyridine may also react with acetic anhydride, however, forming N-acetyl-1,2-dihydro-2-pyridylacetic acid.

Features/Benefits

Acylation is an alternative to silylation, producing stable, volatile derivatives of alcohols, phenols, and amines for analysis by GC/FID. Acetylated compounds are more stable than corresponding silylated compounds.

Typical Procedures

These procedures are intended to be guidelines and may be adapted as necessary to meet the needs of a specific application. Always take proper safety precautions when using an acetylating reagent – consult MSDS for specific handling information.

Prepare a reagent blank (all components, solvents, etc., *except sample*), following the same procedure as used for the sample.

General Procedure

1. Dissolve 5mg sample in 5mL chloroform.
2. Add 0.5mL acetic anhydride and 1 mL acetic acid. Heat at 50°C for 2-16 hours.
3. Remove excess reagent by evaporating the mixture to dryness and redissolve the residue in chloroform for analysis by GC.

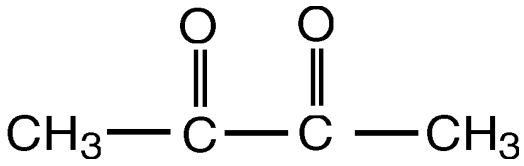
Alditol Formation

1. Dissolve 5mg sample in 5mL chloroform.
2. Add 1mL acetic anhydride:pyridine, 1:1. Heat at 100°C for 20 minutes.
3. Remove excess reagent by evaporating the mixture to dryness and redissolve the residue in ethyl acetate for analysis by GC.

   Derivatization times vary widely, depending upon the specific compound(s) being derivatized. To determine when derivatization is complete, analyze aliquots of the sample at selected time intervals until no further increase in product peak(s) is observed. If derivatization is not complete under the procedure described here, the addition of a catalyst, use of another solvent, higher reaction temperature, longer reaction time, and/or higher reagent concentration should be evaluated.

Properties

Structure:



CAS Number:
108-24-7

Molecular Formula:
$(CH_3CO)_2O$

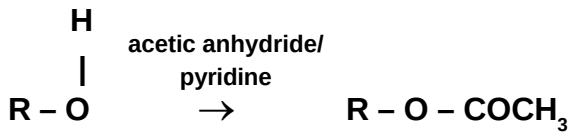
Formula Weight: 102.09

d: 1.080-1.085

n_D: 1.3901

Appearance:
Appearance: clear, colorless liquid

797-0243



Adapted from Blau and Halket (1).

Mechanism (1,2)

Acylation involves the introduction of an acyl group into a molecule that has a replaceable hydrogen atom (OH, NH, or SH group). Anhydride acylating reagents form acidic byproducts that must be removed prior to GC analysis, to prevent destructive effects on the phase in the column. Consequently, acylations with anhydride reagents normally are performed in pyridine, tetrahydrofuran, or another solvent capable of accepting the acid byproducts.

Toxicity – Hazards – Storage – Stability

Acetic anhydride is corrosive and a lachrymator. It can react vigorously with oxidizing materials, and will react violently on contact with water or steam. Store in a bottle or ampul at room temperature, in a dry, well ventilated area. Use only in a well ventilated area.

Recommended storage conditions for the unopened product are stated on the label. If you store an opened container or transfer the contents to another container for later reuse, validate that your storage conditions adequately protected the reagent.

References

1. K. Blau and J. Halket *Handbook of Derivatives for Chromatography* (2nd ed.) John Wiley & Sons, New York, 1993.
2. D.R. Knapp *Handbook of Analytical Derivatization Reactions* John Wiley & Sons, New York, 1979.

Additional Reading

C.J.W. Brooks and E.C. Horning, Anal. Chem. 36, 1540 (1964).

E.C. Horning, *et al.,* Anal. Chem. 36, 1546 (1964).

Ordering Information

Description	Cat. No.
Acetic Anhydride	
10 x 2mL	**33085**
Microreaction Vessels with Hole Caps and Septa	
1mL, pk. of 12	**33293**
3mL, pk. of 12	**33297**
5mL, pk. of 12	**33299**
Books	
Handbook of Derivatives for Chromatography K. Blau and J. Halket	**Z246220**
Handbook of Analytical Derivatization Reactions D.R. Knapp	**23561**

Contact our Technical Service Department (phone 800-359-3041 or 814-359-3041, FAX 800-359-3044 or 814-359-5468) for expert answers to your questions.