Trifluoroacetic Acid

Product Specification

Trifluoroacetic acid (TFA) is a very versatile reagent. Some of the more popular uses for TFA are as a silyl catalyst when derivatizing carbohydrates, as a reagent for purifying large peptides, as an ion pair reagent, and as an LC mobile phase additive.

Features/Benefits

Silyl Catalyst Addition of a small amount of acidic catalyst usually increases the rate or degree of silylation. In acid catalysis, protonation of the silyl donor weakens the Si-X bond (X is the leaving group). TFA derivatives are stable and volatile. Use of TFA in combination with HMDS avoids the formation of ammonium chloride.

Ion Pair Reagent Use of TFA as an ion pair reagent in reversed phase ion-pair chromatography on a nonionic column can maximize polarity differences between proteins or peptides in a sample mixture and improve chromatographic separation. (To avoid protein denaturation, use 0.1% or less TFA.)

Mobile Phase Additive In reversed phase HPLC, inclusion of TFA in the aqueous mobile phase provides an ion with detectable properties and with affinity for the solid phase. Analyte injection into the system gives rise to equilibrium disturbances and influences the distribution of the detectable ionic component.

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 a silylating reagent – consult MSDS for specific handling information. TFA is extremely sensitive to moisture and should be handled under dry conditions.

Carbohydrates in Syrups

1. Place 60-70mg 80% soluble syrup in a vial and dissolve in 1mL pyridine.
2. Add 900µL HMDS, then 100µL TFA. Shake 30 seconds, then let stand 15 minutes, with occasional shaking. Inject aliquot onto GC column for analysis.

   The reagent and the reactivity of the compounds to be derivatized play equally important parts. Derivatization times will vary widely, depending upon the compound being analyzed. 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.

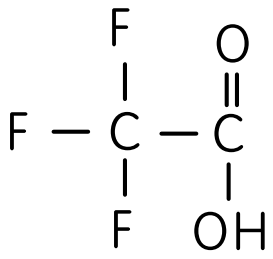
Aflatoxins

(AOAC Method 990.33, Official Methods of Analysis, 16th Ed. 1995.)

1. Place extracted sample containing aflatoxins in screw cap vial. Evaporate to dryness using *clean* nitrogen.
2. Add 200µL hexane to re-dissolve aflatoxins.
3. Add 50µL TFA, cap, and vortex 30 seconds. Let stand 5 minutes.
4. Add 2.0mL deionized water/acetonitrile (9:1). Vortex 30 seconds, then allow layers to separate.
5. Remove aqueous (bottom) layer containing aflatoxins. Filter though 0.45µm syringe-tip filter and inject aliquot onto LC column.

Properties

Structure:



CAS Number:
76-05-1
Molecular Formula:
CF_3COOH
Formula Weight: 114.02
bp: 72.4°C
d: 1.480
Appearance:
clear, colorless liquid
moisture sensitive

796-0342

Toxicity – Hazards – Storage – Stability

TFA is a moisture-sensitive liquid. It may irritate eyes, skin, and/or the respiratory system. Store in a brown bottle or amber ampul at room temperature, in a dry, well ventilated area away from ignition sources. Use only in a well ventilated area and keep away from ignition sources.

Properly stored, this reagent is stable indefinitely. Recommended storage conditions for the unopened product are stated on the label. Moisture will decompose both the reagent and its derivatives. To exclude moisture, Supelco packages this product under nitrogen. If you store an opened container or transfer the contents to another container for later reuse, add desiccant. **Before reuse, validate that your storage conditions adequately protected the reagent.**

Ordering Information

Description	Cat. No.
TFA	
10 x 1mL	**33077**
25mL	**33075**
100mL	**33076**
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**

Additional Reading

K. Blau and J. Halket *Handbook of Derivatives for Chromatography* (2nd ed.) John Wiley & Sons, New York, 1993.

D.R. Knapp *Handbook of Analytical Derivatization Reactions* John Wiley & Sons, New York, 1979.

M. Morvai, P. I. Monlnar *Simultaneous Gas Chromatographic Quantitation of Sugars and Acids in Citrus Fruits, Pears, Bananas, Grapes, Apples and Tomatoes* Chromatographia, 34 (9-10): 502-504 (1992).

G.W. Chapman, R.J. Horvat *Determination of Non-volatile (Organic) Acids and Sugars from Fruits and Sweet Potato Extracts by Capillary GLC and GLC-MS* J. Agric. Food Chem., 37 (4): 947-950 (1989).

P. Englmaier *High Resolution GLC of Carbohydrates as Their Dithioacetal-Trimethylsilylates and Trifluoroacetates* J. High Res. Chromatogr., 13 (2): 121-125 (1990).

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.