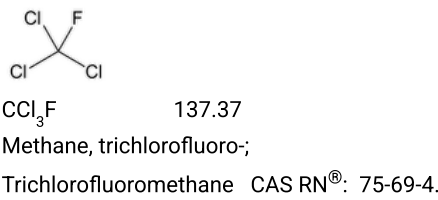


Trichloromonofluoromethane



DEFINITION
Trichloromonofluoromethane contains NLT 99.6% and NMT 100.0% of trichloromonofluoromethane (CCl₃F), calculated on the anhydrous basis.

IDENTIFICATION
• **A.** The IR absorption spectrum, determined in a 10-cm cell with sodium chloride windows, at atmospheric pressure, exhibits maxima, among others, at the following wavelengths, in μm: 4.67 (m), 5.95 (m), 7.28 (s), 8.06 (m), 9.2 (vs), 10.7 (vs), 11.8 (vs), and 13.4 (m). The stronger maxima are best obtained at pressures less than 10 mm of mercury.

ASSAY
• **PROCEDURE**
System suitability solution: Introduce a liquid-phase mixture of dichlorodifluoromethane, dichlorotetrafluoroethane, and trichloromonofluoromethane into an evacuated headspace vial.
Sample solution: Introduce the liquid phase of Trichloromonofluoromethane into an evacuated headspace vial.
Chromatographic system
(See [Chromatography \(621\), System Suitability.](#))
Mode: GC
Detector: Flame ionization
Column: 2-mm × 1.8-m stainless steel; 1% phase G25 on support S12
Temperatures
Injection port: 110°
Detector: 200°
Column: See [Table 1](#).

Table 1

Initial Temperature (°)	Temperature Ramp (°/min)	Final Temperature (°)	Hold Time at Final Temperature (min)
70	10	170	5

Carrier gas: Helium
Flow rate: 20 mL/min
Headspace sampler: The bath temperature is 100°, the valve/loop temperature is 105°, and the sampling time is 3 s. Make adjustments as necessary to optimize peak areas to record trace-level impurities.
System suitability
Sample: Gas phase headspace of the *System suitability solution*

[NOTE—The relative retention times for dichlorodifluoromethane, dichlorotetrafluoroethane, and trichloromonofluoromethane are 0.5, 0.8, and 1.0, respectively.]

Suitability requirements

Resolution: NLT 2.0 between dichlorotetrafluoroethane and trichloromonofluoromethane

Analysis

Sample: Gas phase headspace of the *Sample solution*

Calculate the percentage of trichloromonofluoromethane (CCl₃F) in the portion of Trichloromonofluoromethane taken.

Acceptance criteria: 99.6%–100.0% on the anhydrous basis

IMPURITIES**• INORGANIC CHLORIDES**

Sample: 7 g

Analysis: Place 5 mL of anhydrous methanol in a test tube, add 3 drops of a saturated solution of silver nitrate in anhydrous methanol, shake, and add the *Sample*.

Acceptance criteria: No opalescence or turbidity is produced.

• CHROMATOGRAPHIC PURITY

Analysis: In the chromatogram from the Assay, identify the dichlorodifluoromethane and dichlorotetrafluoroethane peaks from relative retention times of those peaks in the chromatogram of the *System suitability solution*.

Acceptance criteria

Sum of the peak areas for dichlorodifluoromethane and dichlorotetrafluoroethane: NMT 0.2% of the total of all peak areas

Sum of the areas of all peaks other than that for trichloromonofluoromethane: NMT 0.4% of the total of all peak areas.

SPECIFIC TESTS**• BOILING TEMPERATURE**

Analysis: Determine as directed in [Propellants \(602\)](#).

Acceptance criteria: Approximately 24°

• WATER

Analysis: Determine as directed in [Propellants \(602\)](#), and [Water Determination, Method Ic \(921\)](#).

Acceptance criteria: NMT 0.001%

• HIGH-BOILING RESIDUES

Analysis: Determine as directed in [Propellants \(602\)](#).

Acceptance criteria: NMT 0.01%

ADDITIONAL REQUIREMENTS

• PACKAGING AND STORAGE: Preserve in tight cylinders, and avoid exposure to excessive heat.

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
TRICHLOROMONOFUOROMETHANE	Documentary Standards Support	SM52020 Small Molecules 5
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM52020 Small Molecules 5

Chromatographic Database Information: [Chromatographic Database](#)

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