



Certificate of Analysis

ISO 9001

Reference Material

Product name

1,1-Dichloro-1-(difluoromethoxy)-2,2,2-trifluoroethane

Product code

MM0500.04

CAS number

32778-07-7

Molecular weight

218.94

Molecular formulaC₃HCl₂F₅O**Lot number**

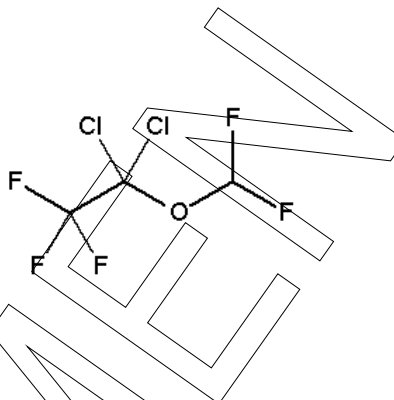
1029650

Appearance

colourless liquid

Long-term storage

-18 °C, dark

Assay "as is"
99.6 %

Date of shipment:

05 Feb 2020

Producer confirms that this reference material (RM) meets the specification detailed on this Certificate of Analysis for **two years** from the date of shipment, provided the substance is stored under the recommended conditions unopened in the original container.

Release by:	Date of Release:		Product Release
Dr. Sabine Schröder	Luckenwalde, 12 Aug 2019		



MikromolTM

Product information

For laboratory use only. Not suitable for human or animal consumption.

Before usage of the RM, it should be allowed to warm to room temperature. No drying required, as the certified value is already corrected for the content of water and other volatile materials.

The product quality is controlled by regularly performed quality control tests (retests).

Further content

Identity

Assay

Final result

Revision table

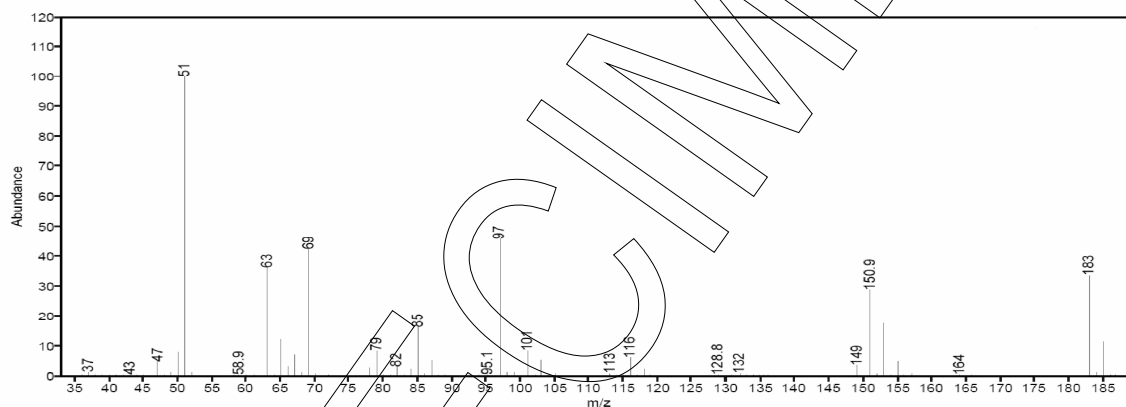
SPECIMEN



Identity

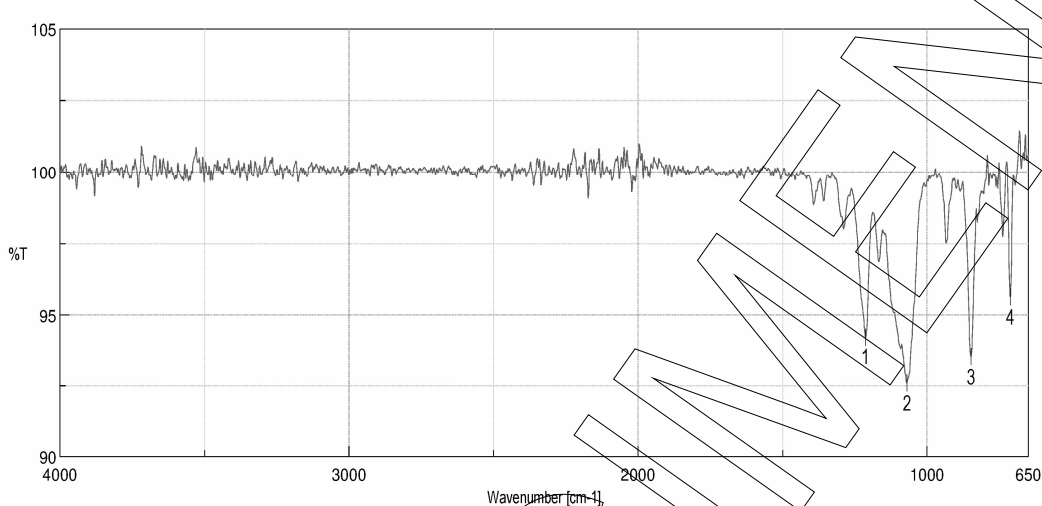
The identity of the reference material was established by following analyses.

Method	Conditions	Result
MS	EI, 70eV, detector temperature: 280 °C	Structure confirmed





Method	Conditions	Result
IR	Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) Spectroscopy	Structure confirmed



Results of Peak Find		
No.	Position	Intensity
1	1213.01	94.2115
2	1070.3	92.5915
3	848.525	93.5126
4	712.569	95.6196

Assay

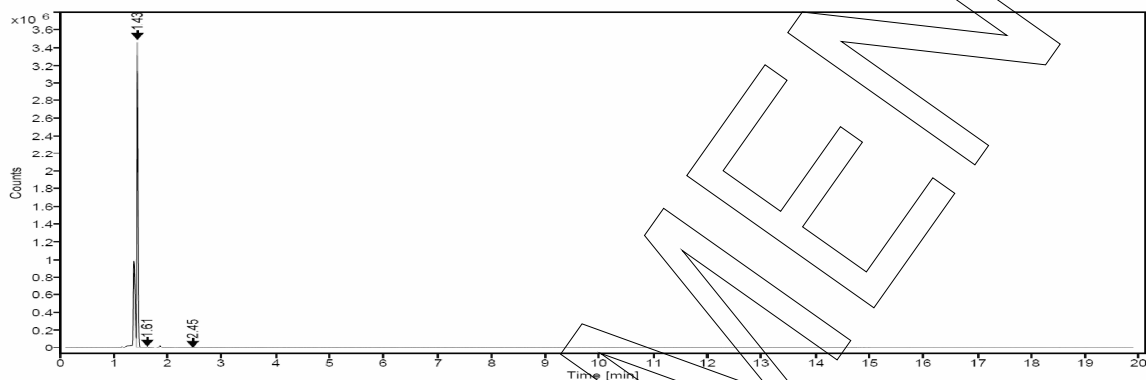
The assay of the reference material was assessed by following analyses.

Purity by Gas Chromatography (GC)

GC Conditions:	
Column	HP-5MS 30 m x 0.25 mm x 0.25 µm
Detector	EI, 70 eV; 35 to 550 amu; 280 °C
Injector	Split 20:1, 220 °C
Flow rate	Helium 1.50 ml/min
Oven program	Initial Temp.: 35 °C for 10 min Heating Rate: 40 °C/min Final Temp.: 230 °C for 5 min



GC chromatogram and peak table



Area percent report - sorted by signal				
Pk #	Retention time	Area	Area %	
1	1.43	4750030.29606	99.57	
2	1.61	16142.46174	0.34	
3	2.45	4152.74302	0.09	
Totals		4770325.50082	100.00	

The content of the analyte was determined as ratio of the peak area of the analyte and the cumulative areas of the purities, added up to 100 %. Air peaks were ignored in calculation.

Result (n = 3)

99.59 %; SD = 0.09 %



Volatile content

Water content	
Method	Karl Fischer titration
Result	No significant amounts of water were detected (< 0.05 %).

Residual solvents	
Method	¹ H-NMR
Result (n = 1)	No significant amounts of residual solvents were detected (< 0.05 %).

Final result

Assay "as is": 99.59 %

The assay "as is" is assessed by 100% method (mass balance) and is equivalent to the assay based on the not anhydrous and not dried substance respectively.

The calculation of the 100% method follows the formula:

$$\text{Assay (\%)} = (100 \% - \text{volatile contents (\%)}) * \frac{\text{Purity (\%)}}{100 \%}$$

Volatile contents are considered as absolute contributions and purity is considered as relative contribution. Inorganic residues are excluded by additional tests.

Revision table

Revision	Date	Reason for revision
00	12 Aug 2019	Release of the Certificate of Analysis - initial version

Product warranties for the RM are set out in the terms and conditions of purchase.