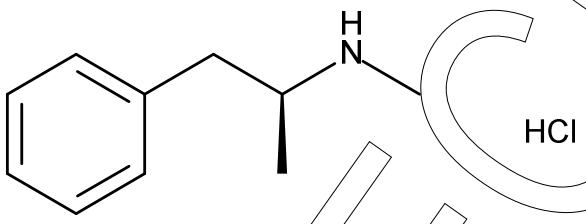
Certificate of Analysis

Reference Standard

Methamphetamine Hydrochloride
((S)-(+)-Methamphetamine Hydrochloride)



Molecular Formula:	$C_{10}H_{15}N \cdot HCl$
Molecular Weight:	185.69
CAS Number:	51-57-0

Catalogue Number:	LGCFOR0964.00
Lot Number:	832537
Long-term Storage:	2 to 8 °C, dark
Appearance:	white solid
Melting Point:	174 °C
Assay ‘as is’:	99.8 %

Date of shipment: **2020-November-30**

This certificate is valid for two years from the date of shipment provided the substance is stored under the recommended conditions unopened in the original container.

LGC Quality | ISO 9001:2008 DQS 102448 QM08

LoGiCal® produced by LGC

LGC GmbH, Louis-Pasteur-Str. 30, D-14943 Luckenwalde, Germany

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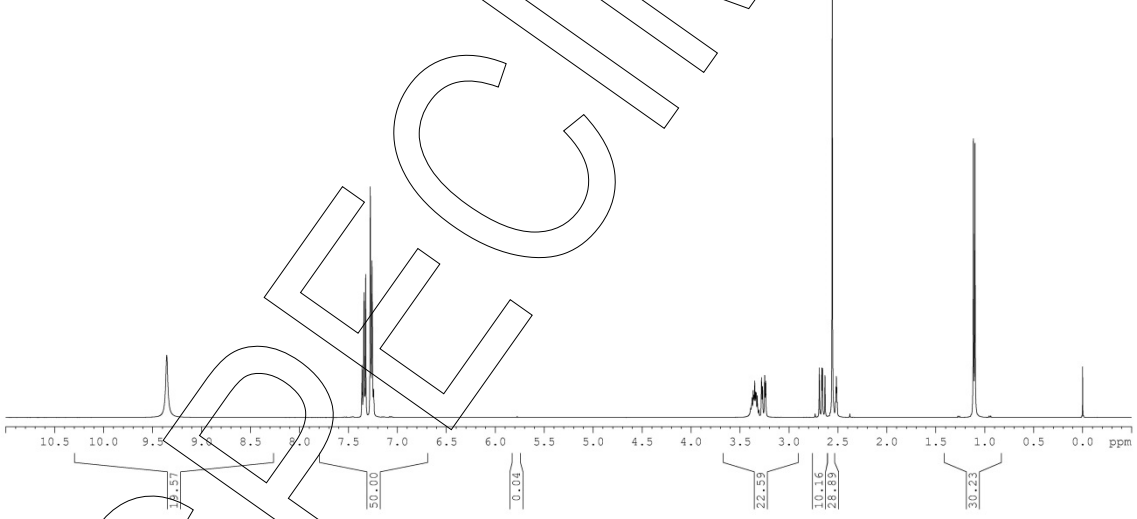
I. Identity

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

Ia. ^{1}H-NMR Spectrum

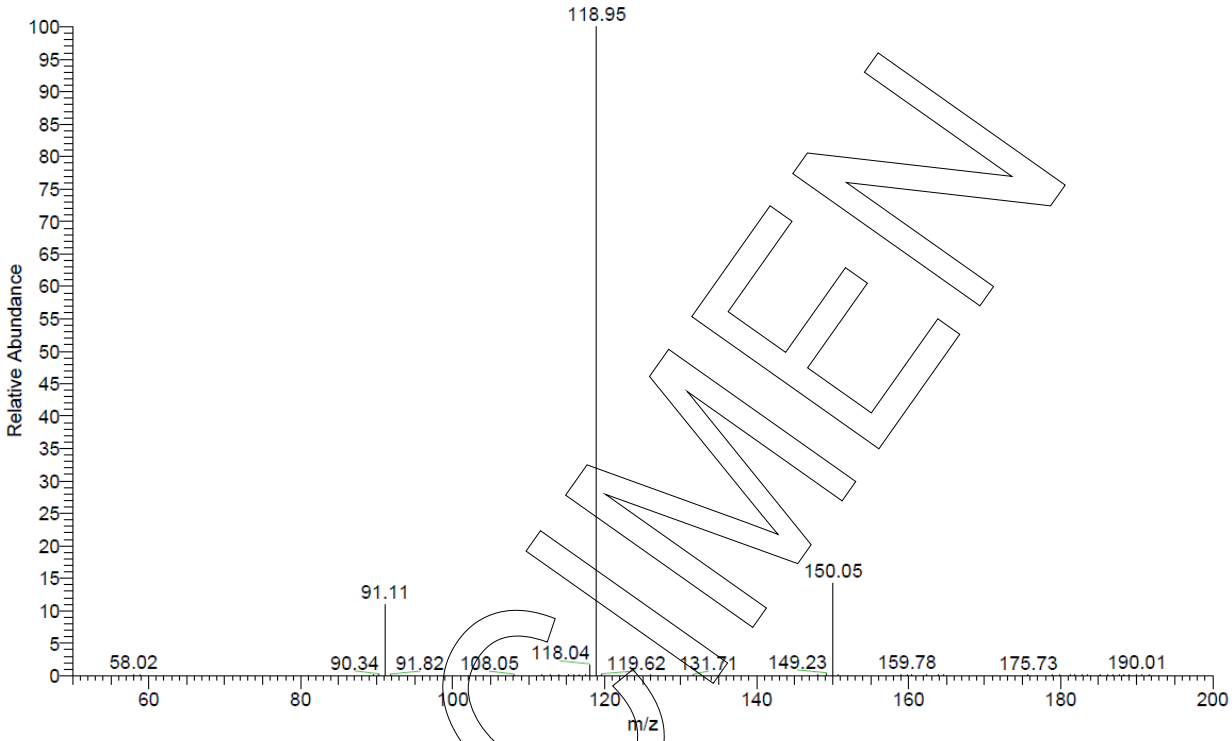
Conditions: 400 MHz, DMSO-d_6



The structure is confirmed by the signals of the spectrum and their interpretation.

Ib. Mass Spectrum

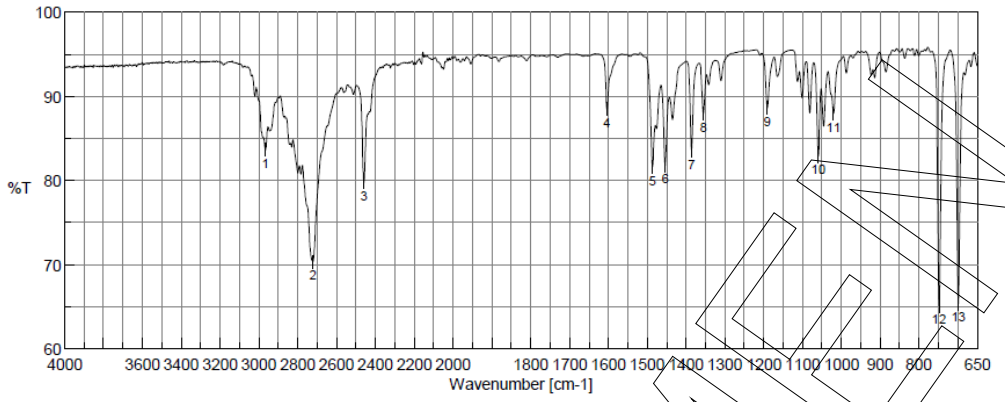
Method: 4.5 kV ESI+; vaporization temperature: 200 °C



The signals of the mass spectrum and their interpretation are consistent with the structural formula.

Ic. IR Spectrum

Method: Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) Spectroscopy



Result of Peak Picking

No.	Position	Intensity
1	2965.98	83.6089
2	2722.03	70.284
3	2458.8	79.7495
4	1603.52	88.4675
5	1486.85	81.59
6	1454.06	81.7636
7	1385.6	83.5436
8	1354.75	87.9805
9	1190.83	88.596
10	1059.69	82.8633
11	1020.16	87.9666
12	748.245	65.087
13	699.069	65.2863

The signals of the IR spectrum and their interpretation are consistent with the structural formula.

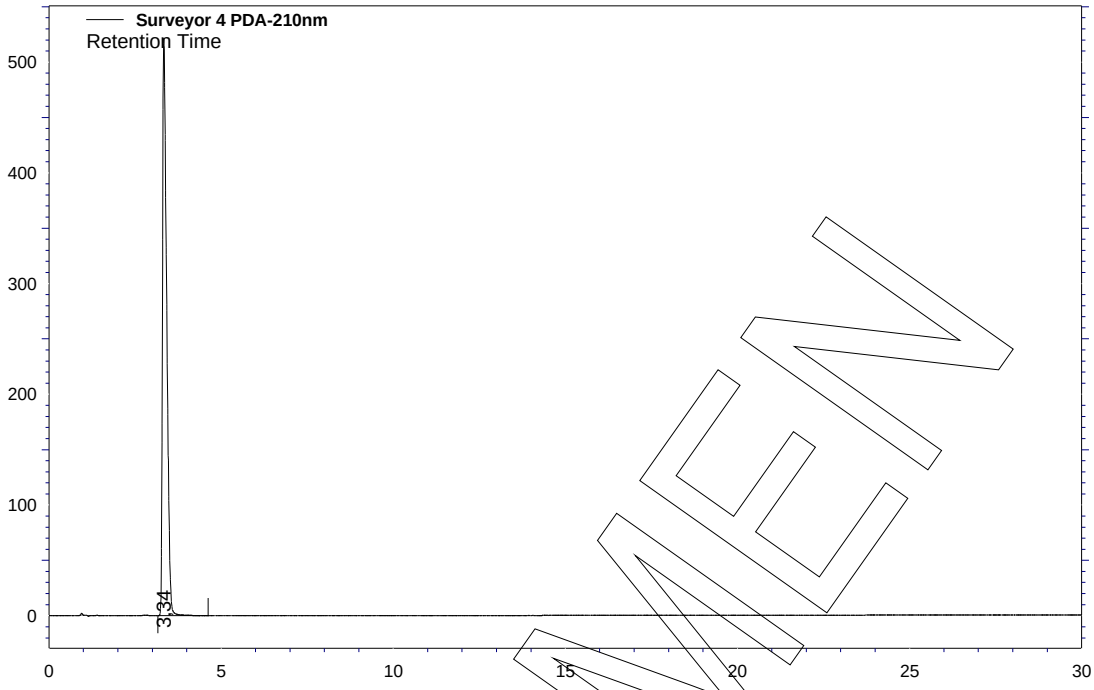
II. Purity

IIa. High Performance Liquid Chromatography (HPLC)

The purity of the reference substance was analysed by high performance liquid chromatography (HPLC).

HPLC Conditions:

Column:	Conditions:	Detector:	Injector:
LiChrospher 60 RP-select B 5 µm, 125 x 4 mm	1.0 ml/min, 40 °C Water/Acetonitrile 85/15 (v/v); 0.1 % H_3PO_4	DAD 210 nm	Auto 8 µl; 0.0706 mg/ml in Water/Acetonitrile 85/15 (v/v)



Area Percent Report - Sorted by Signal

Pk #	Retention Time	Area	Area %
1	3.34	4386673	100.00
Totals		4386673	100.00

For the calculation the system peaks were ignored. 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 %.

Results:

Average	100.00 %
Number of results	n=6
Standard deviation	< 0.01 %

IIb. Water Content

Method: Karl Fischer titration

Results:

Average	0.11 %
Number of results	n=3
Standard deviation	0.01 %

IIc. Residual Solvents

Method: ^{1}H-NMR

Result: 0.09 % Dichloromethane

III. Final Result

Chromatographic purity (HPLC)	100.00 %
Water content	0.11 %
Residual solvents	0.09 %
Assay (100 % method)[1]	99.80 %

The assay is assessed to be 99.8 % ‘as is’

The assay 'as is' is equivalent to the assay based on the not anhydrous and not dried substance respectively.

Release Date:

Luckenwalde, 2018-06-19

Dr. Sabine Schröder

Product Release

[1] 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, purity is considered as relative contribution.

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