

## Certificate of Analysis

ISO 9001

### Reference Material

#### Product name

2-[(2R)-2-Hydroxy-3-[[4-(3-oxo-4-morpholinyl)phenyl]amino]propyl]-1H-isoindole-1,3(2H)-dione

#### Product code

MM3629.09

#### CAS number

446292-07-5

#### Molecular weight

395.41

#### Molecular formula

C<sub>21</sub>H<sub>21</sub>N<sub>3</sub>O<sub>5</sub>

#### Lot number

1011800

#### Appearance

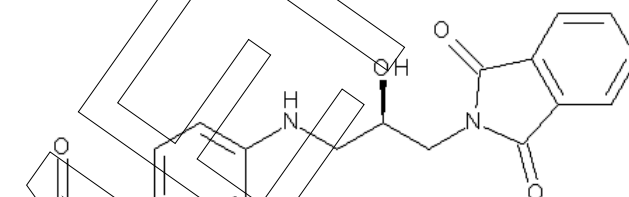
white solid

#### Melting point (DSC)

214 °C

#### Long-term storage

2 to 8 °C, dark



Assay "as is"  
98.6 %

Date of shipment:

13 Sep 2019

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.

<b>Release by:</b>	<b>Date of Release:</b>		Product Release
Dr. Sabine Schröder	Luckenwalde, 12 Sep 2019		



**Mikromol<sup>TM</sup>**

## 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

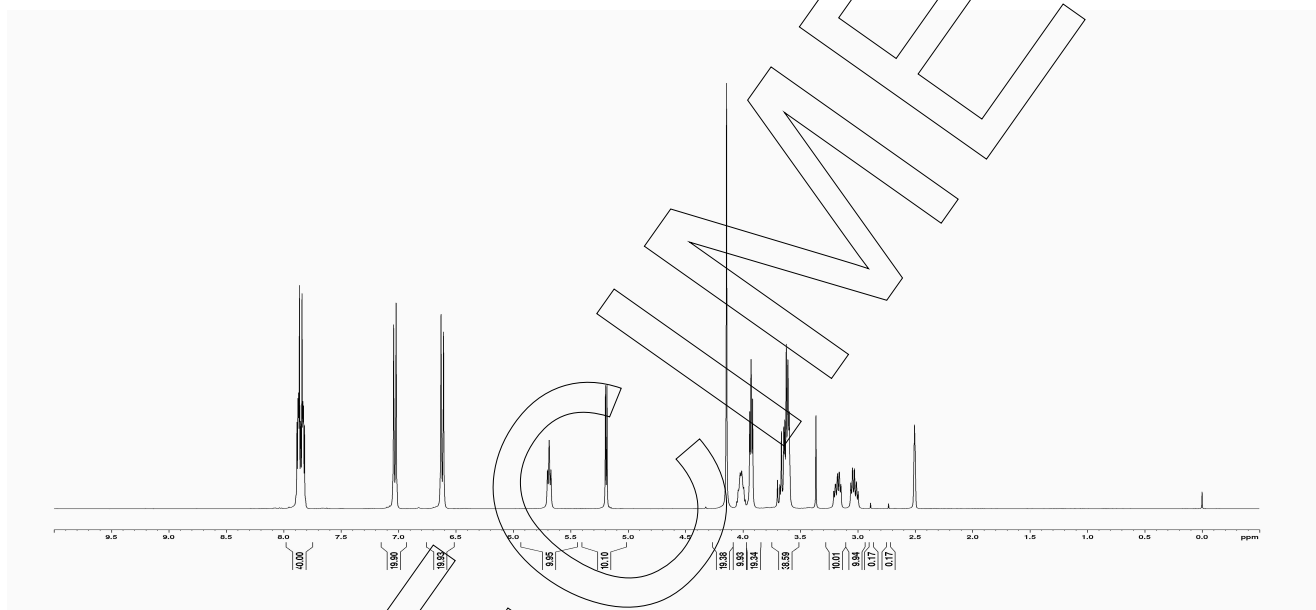
SPECIMEN



## Identity

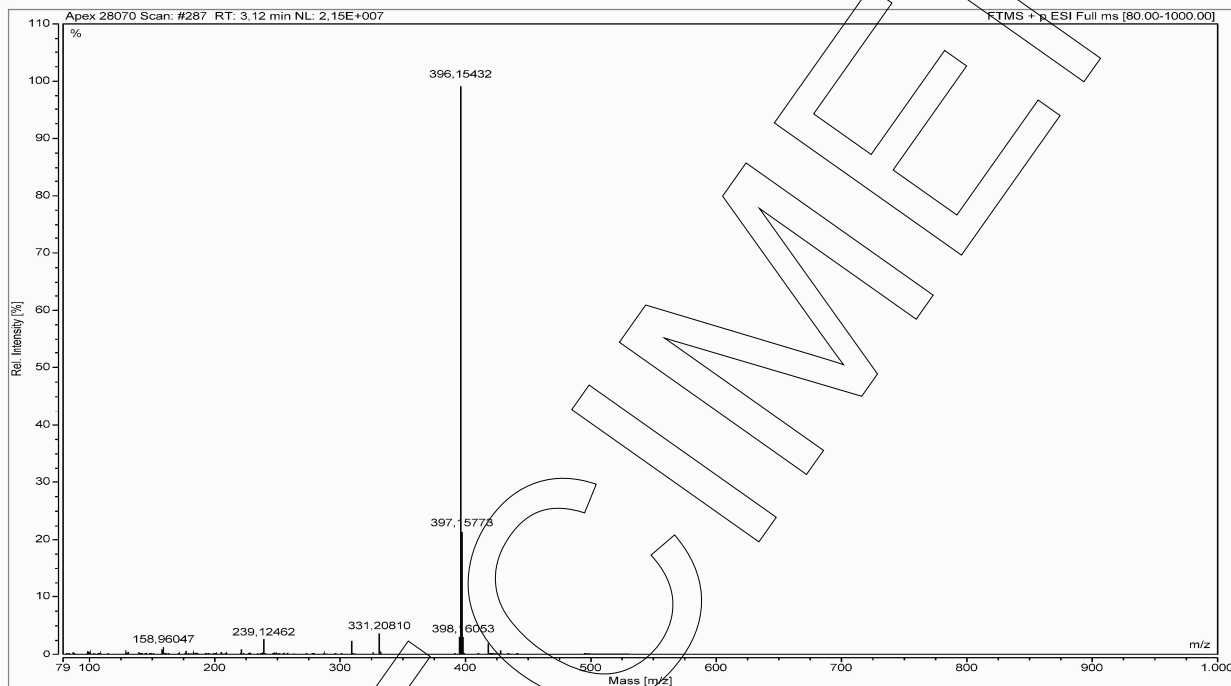
The identity of the reference material was established by following analyses.

Method	Conditions	Result
<sup>1</sup> H-NMR	400 MHz, DMSO-d <sub>6</sub>	Structure confirmed



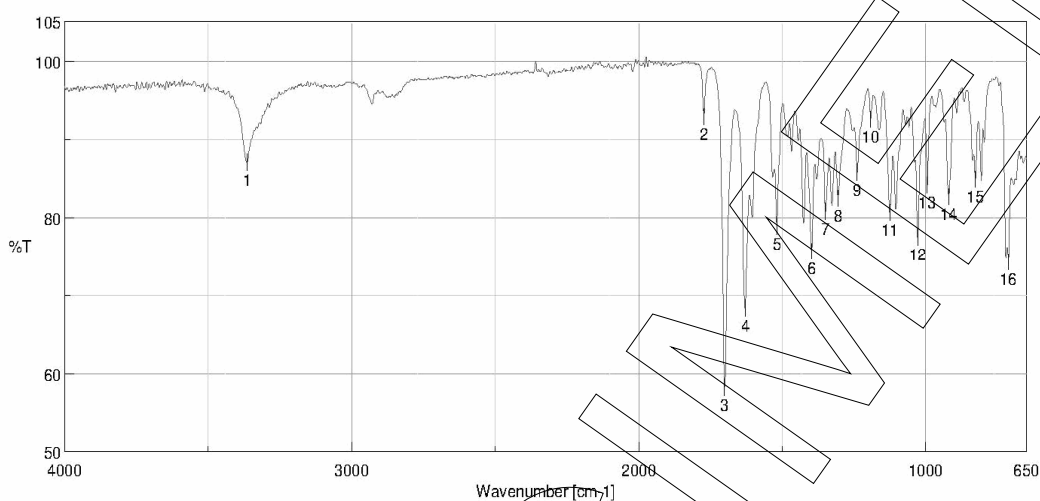


Method	Conditions	Result
MS	3.5 kV ESI+; capillary temperature: 269 °C Theoretical value: 396.15540	Structure confirmed





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



Results of Peak Find

No.	Position	Intensity
1	3365.17	87.0026
2	1773.23	92.9438
3	1700.91	58.1908
4	1629.55	68.3048
5	1519.63	78.8421
6	1398.14	75.7079
7	1349.93	80.7258
8	1305.57	82.5247
9	1239.04	85.7416
10	1191.79	92.5875
11	1125.26	80.6661
12	1027.87	77.473
13	995.089	84.2154
14	919.879	82.7234
15	827.312	84.9241
16	712.569	74.2954



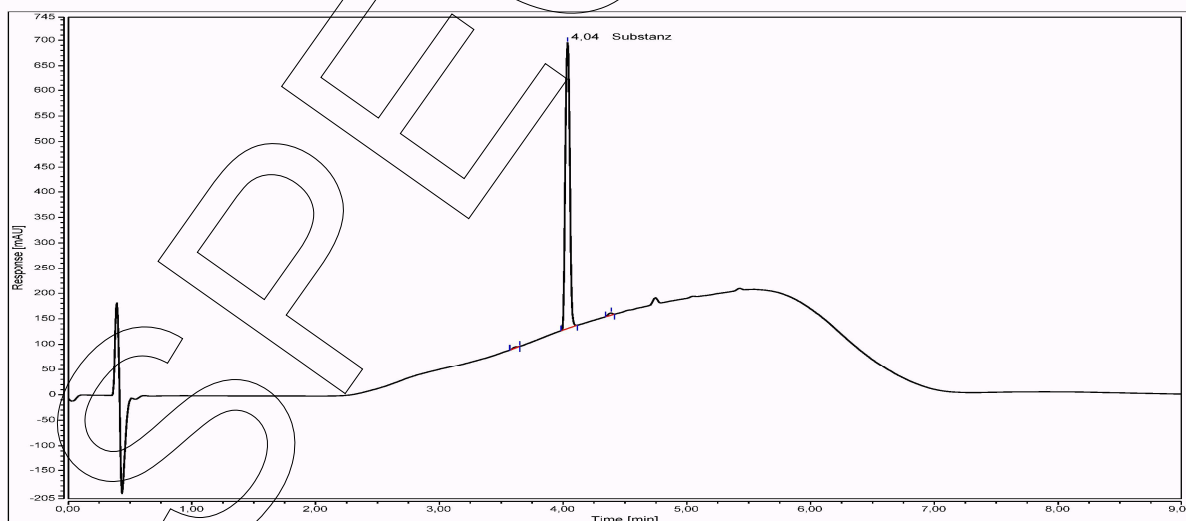
## Assay

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

### Purity by High Performance Liquid Chromatography (HPLC)

HPLC Conditions:	
Column	Cortecs UPLC C18 +; 1.6 µm, 75 x 2.1 mm
Column temperature	40 °C
Detector	DAD, 220 nm
Injector	Auto 3.00 µl; 0.051 mg/ml in Acetonitrile/Water 50/50 (v/v)
Flow rate	0.5 ml/min
Phase A	Water, 0.1 % HCOOH
Phase B	Acetonitrile, 0.1 % HCOOH
Gradient program	0-1 min A/B 98/2 1-4 min A/B to 2/98 4-5 min A/B to 98/2 5-9 min A/B 98/2 (v/v)

HPLC chromatogram and peak table





## Area percent report - sorted by signal

Pk #	Retention time	Area	Area %
1	3.649	0.0941	0.39
2	4.035	23.6867	98.83
3	4.389	0.1860	0.78
Totals		23.9668	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 %. System peaks were ignored in calculation.

### Result (n = 3)

98.83 %; SD = 0.02 %

### Volatile content

#### Water content

Method Karl Fischer titration

Result (n = 3) 0.14 %; SD < 0.01 %

#### Residual solvents

Method <sup>1</sup>H-NMR

Result (n = 1) Sum: 0.10 %

0.10 % Dimethylformamide



## Final result

**Assay "as is": 98.59 %**

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 Sep 2019	Release of the Certificate of Analysis - initial version

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