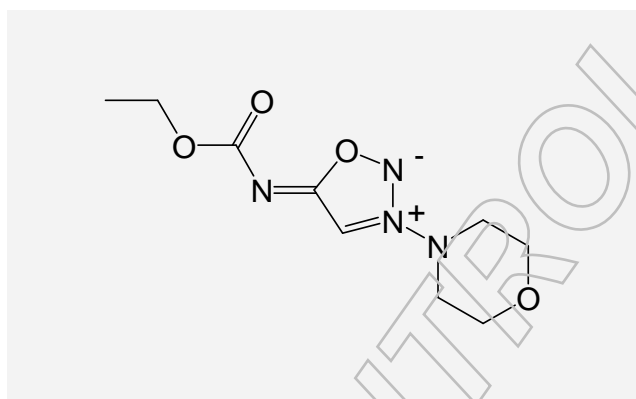


## Certificate of Analysis

### Reference Substance

#### Molsidomine

Catalogue Number:	LGCFOR0267.00	Long-term Storage:	2 to 8 °C, dark
Lot Number:	6434	Appearance:	white solid
Molecular Formula:	C <sub>9</sub> H <sub>14</sub> N <sub>4</sub> O <sub>4</sub>	Melting Point:	141 °C
Molecular Weight:	242.23	Assay 'as is':	99.7 %
CAS Number:	[ 25717-80-0 ]		



Date of shipment: **2016-May-20**

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

Release Date: 2011-02-18

LGC GmbH

Dr. Sabine Schröder  
Product Release

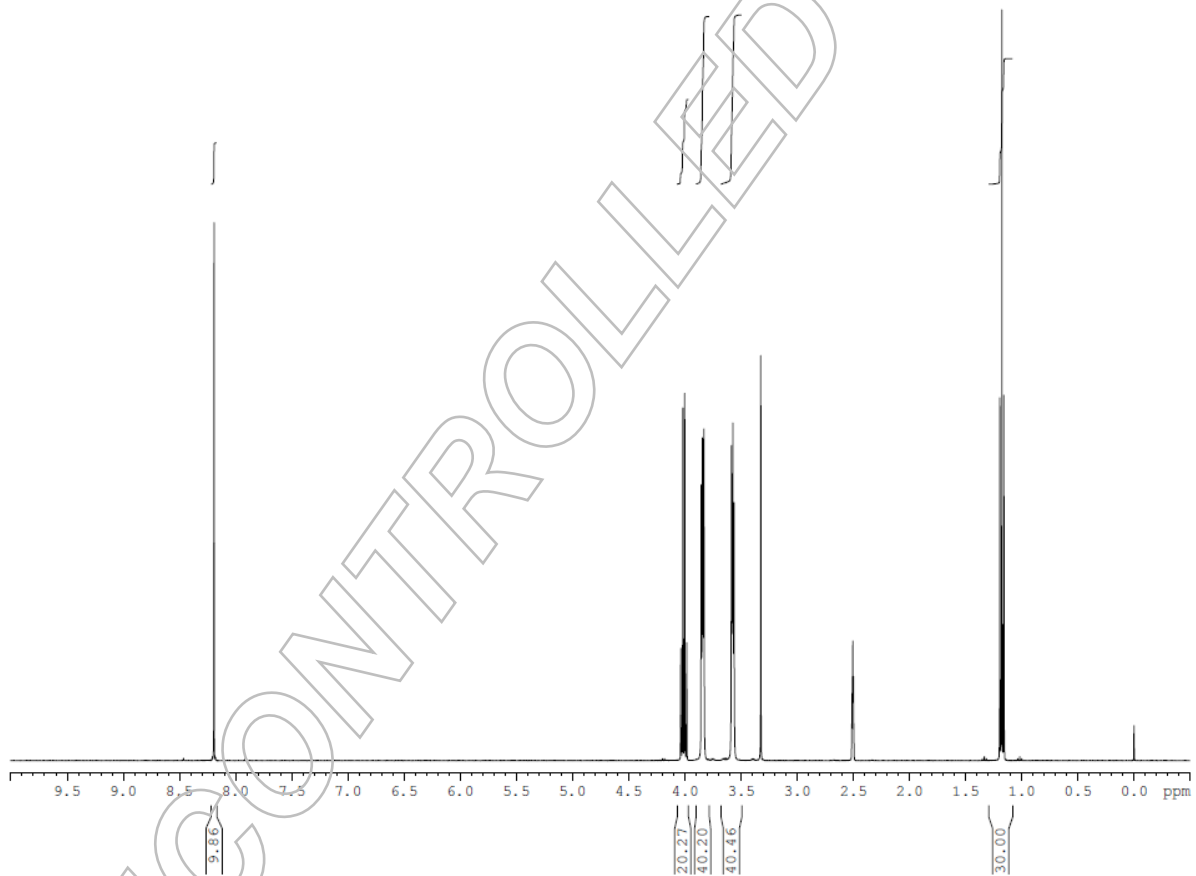
## I. Identity

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

### Ia. <sup>1</sup>H-NMR Spectrum

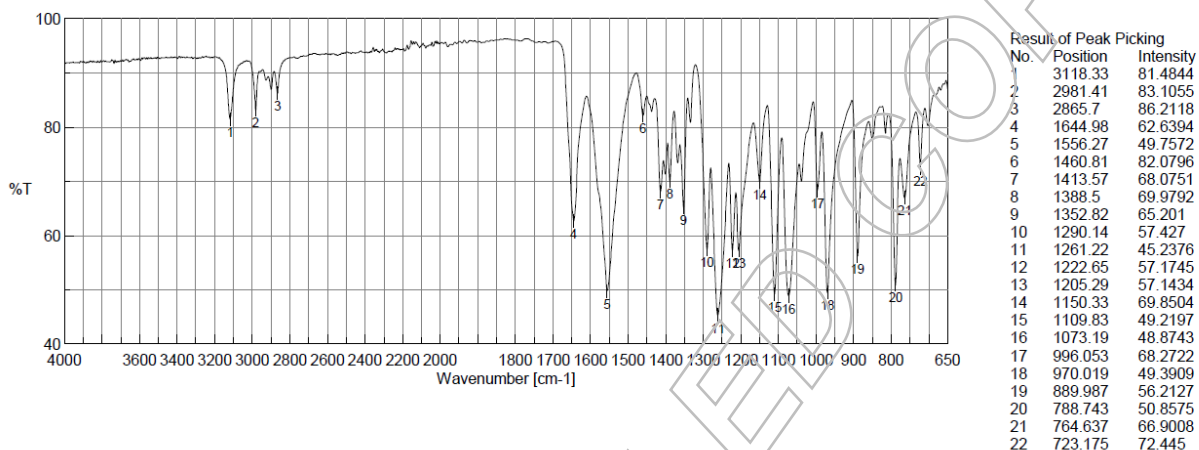
Conditions: 400 MHz, DMSO-d<sub>6</sub>

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



## Ib. IR Spectrum

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



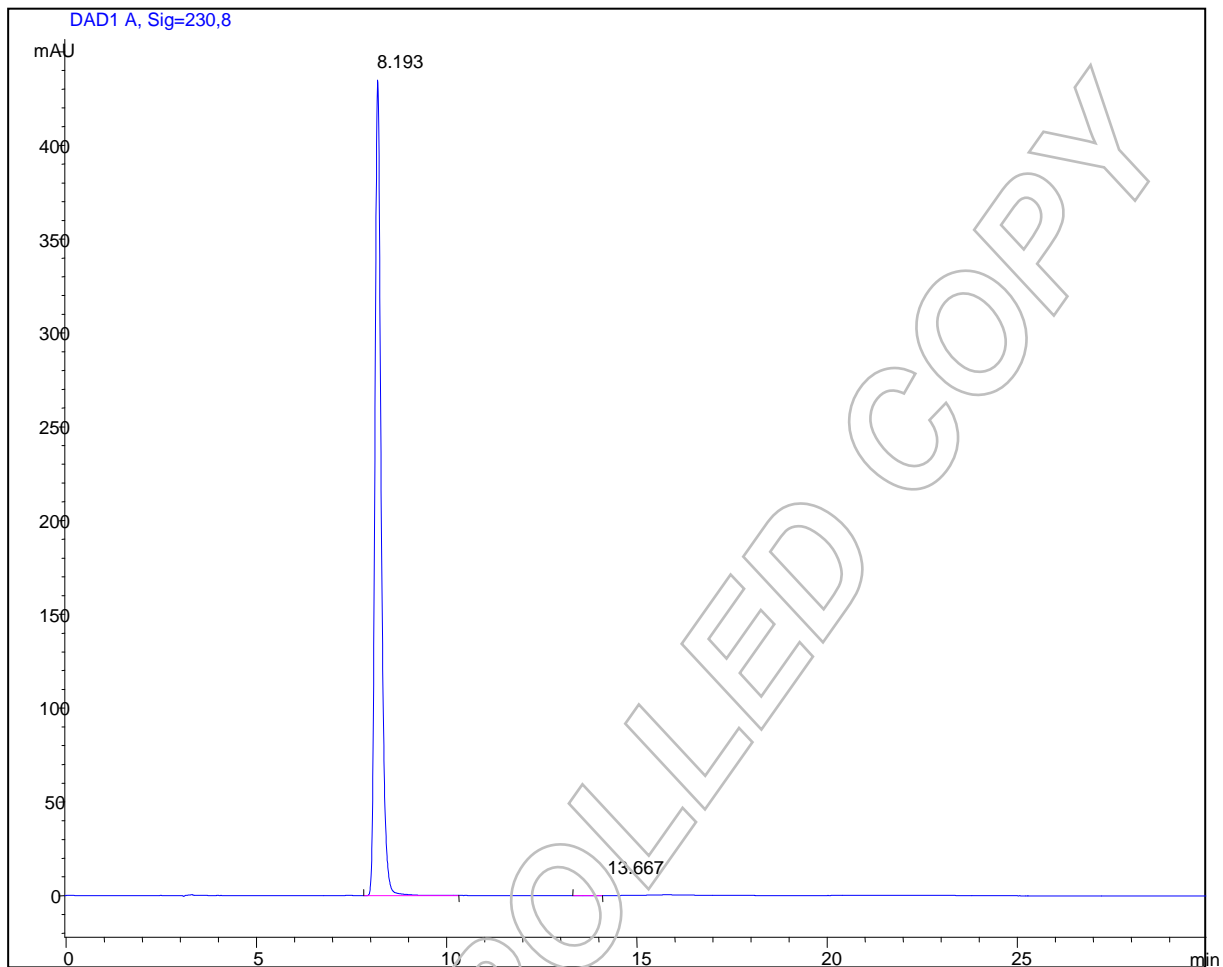
The signals of the IR spectrum and their interpretation are consistent with the structural formula.

## II. Purity

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

### HPLC Conditions:

Column:	Conditions:	Detector:	Injector:
Luna C 18(2)	1.0 ml/min, 40 °C	DAD	Auto
5 µm, 250 x 4.6 mm	mob. Phase A: 4.0 g/l KH <sub>2</sub> PO <sub>4</sub> /Methanol 65/35 (v/v)	230 nm	5 µl; 0.5406 mg/ml in
	mob. Phase B: Methanol		Water/Acetonitrile
	0 – 10 min A/B		50/50 (v/v)
	10 – 12 min A/B to		
	12 – 14 min A/B		
	14 – 16 min A/B to		
	16 – 30 min A/B		



### Area Percent Report - Sorted by Signal

Pk #	Retention Time	Area	Area %
1	8.19	4980.62	99.96
2	13.67	2.08	0.04
Totals		4982.71	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** 99.96 %  
**Number of results** n=6  
**Standard deviation** < 0.01 %



Excellence through measurement

LGCFOR0267.00 Lot Number 6434

### III. Water Content

Method: Karl Fischer titration

**Results:**

<b>Average</b>	0.22 %
<b>Number of results</b>	n=2

### IV. Residual Solvents

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

No significant amounts of residual solvents were detected (< 0.05 %).

### V. Final Result

<b>Total impurities (HPLC)</b>	0.04 %
<b>Water content</b>	0.22 %
<b>Residual solvents</b>	n. d. (not detected)
<b>Assay (100 % method) <sup>1</sup></b>	99.74 %

The assay is assessed to be 99.7 % 'as is'

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

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<sup>1</sup> The calculation of the 100 % method follows the formula:

$$\text{Assay (\%)} = (100 \% - \text{KF} - \text{RES}) * \frac{\text{Purity HPLC (\%)}}{100 \%}$$

Water (KF) and Residual solvents (RES) are considered as absolute contributions, HPLC purity is considered as relative contribution.

LGCFOR0267.00 Lot Number 6434

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