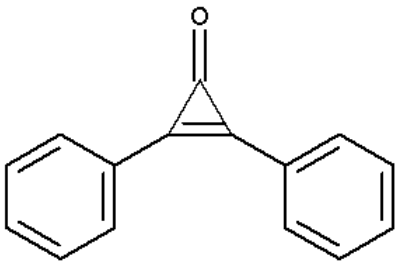
# Certificate of Analysis

## Reference Standard

Diphenylcyclopropenone



| | |
|---|---|
| Molecular Formula: | $C_{15}H_{10}O$ |
| Molecular Weight: | 206.24 |
| CAS Number: | 886-38-4 |

| | |
|---|---|
| Catalogue Number: | LGCFOR3487.00 |
| Lot Number: | 84739 |
| Long-term Storage: | 2 to 8 °C, dark |
| Appearance: | white solid |
| Melting Point (DSC): | 121 °C |
| Assay 'as is': | 98.6 % |

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

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







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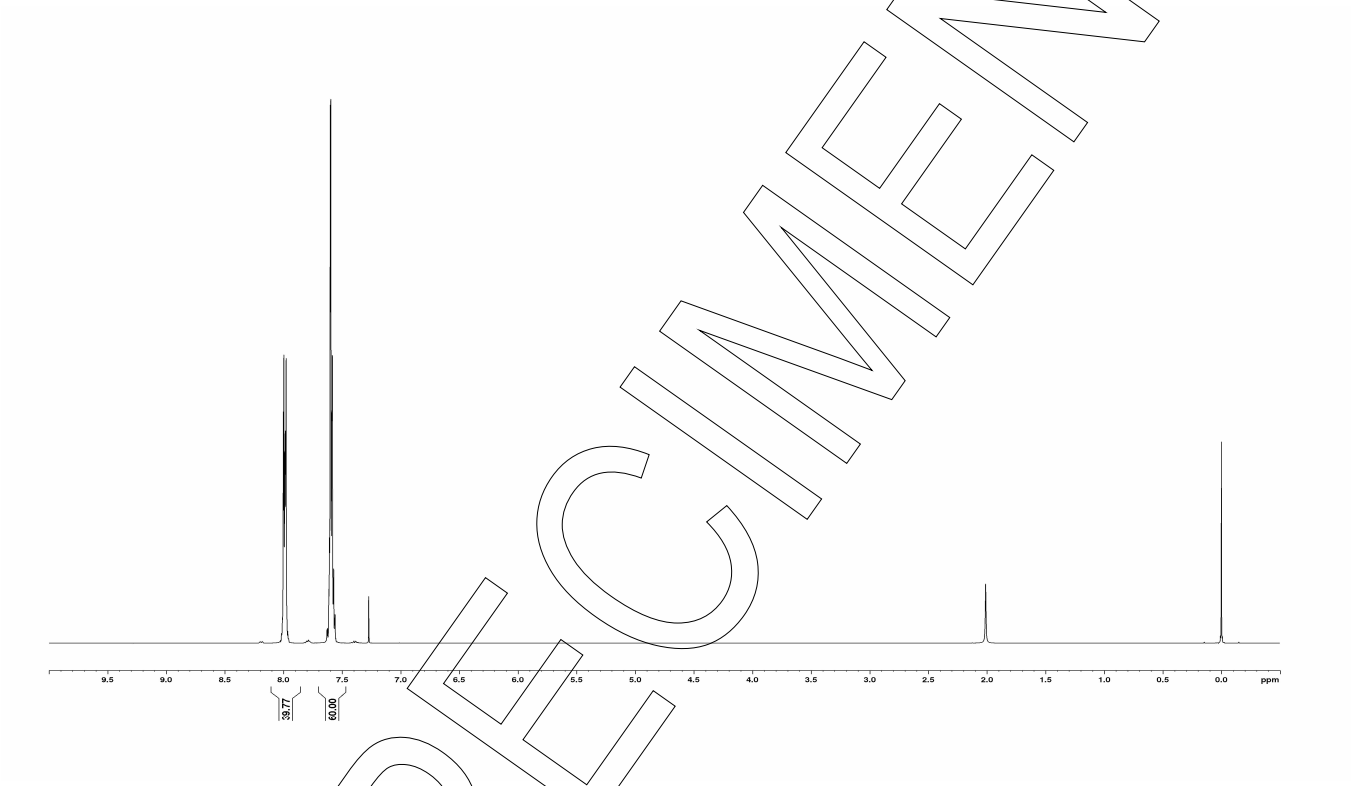
## I. Identity

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

## Ia. $^{1}$H-NMR Spectrum

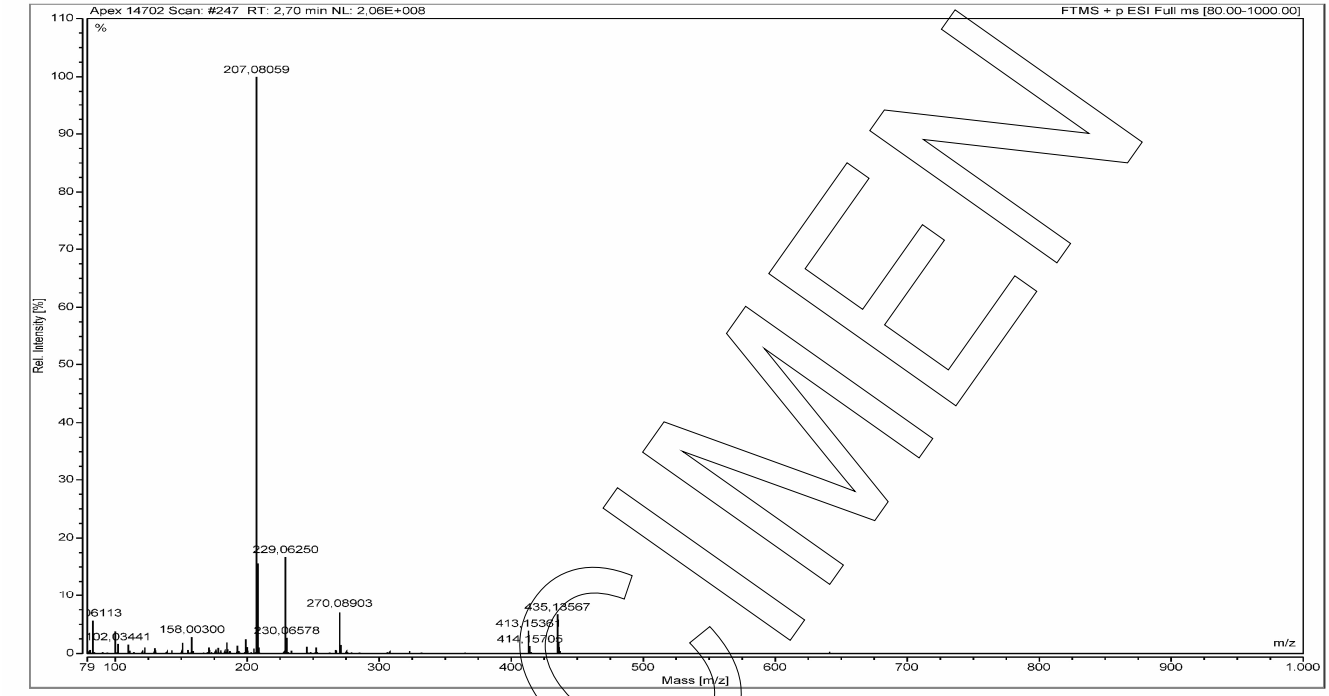
Conditions: 400 MHz, $CDCl_3$




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

## Ib. Mass Spectrum

Method: HRMS; 3.5 kV ESI+; capillary temperature: 269 °C

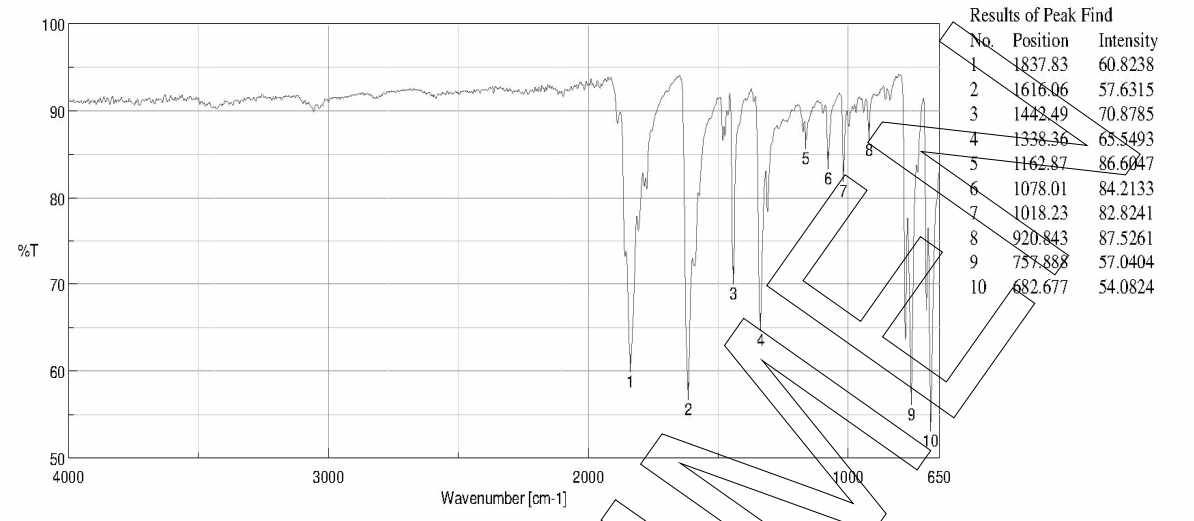



Theoretical value: 207.08044

The signal of the MS spectrum is consistent with the theoretical value and its interpretation is consistent with the structural formula.

## Ic. IR Spectrum

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




Results of Peak Find

| No. | Position | Intensity |
|---|---|---|
| 1 | 1837.83 | 60.8238 |
| 2 | 1616.06 | 57.6315 |
| 3 | 1442.49 | 70.8785 |
| 4 | 1338.36 | 65.5493 |
| 5 | 1162.87 | 86.6047 |
| 6 | 1078.01 | 84.2133 |
| 7 | 1018.23 | 82.8241 |
| 8 | 920.843 | 87.5261 |
| 9 | 757.888 | 57.0404 |
| 10 | 682.677 | 54.0824 |

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

## II. Purity

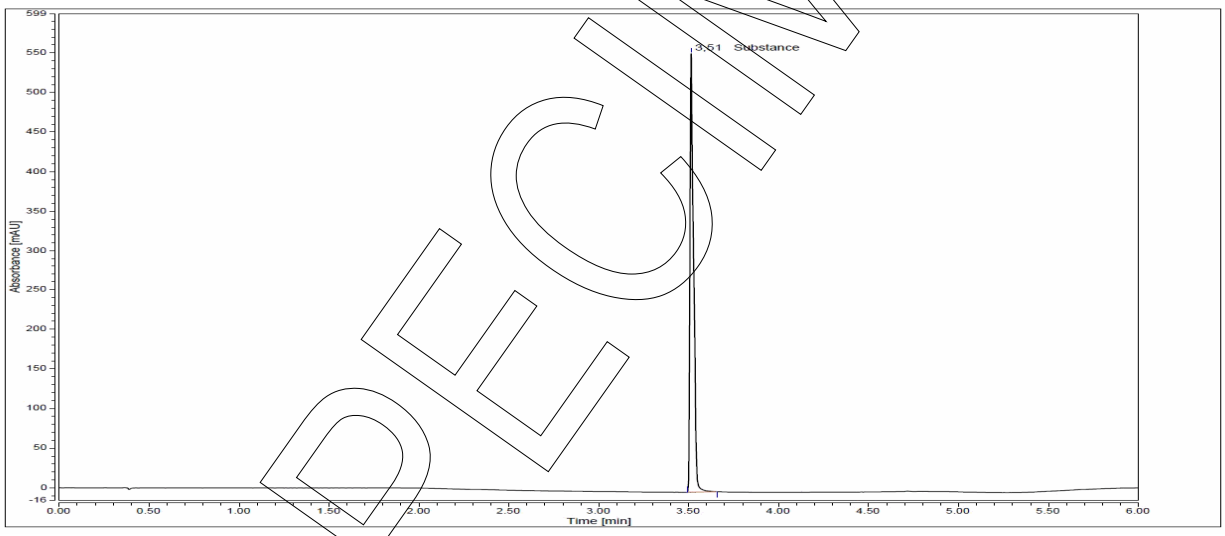
### IIa. High Performance Liquid Chromatography (HPLC)

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

**HPLC Conditions:**

| **Column:** | **Conditions:** | **Detector:** | **Injector:** |
|---|---|---|---|
| Cortecs UPLC C18 + 1.6 µm, 75 x 2.1 mm | 0.50 ml/min, 40 °C<br>mob. Phase A: Water, 0.1 % HCOOH<br>mob. Phase B: Acetonitrile, 0.1 % HCOOH | DAD<br>295 nm | Auto<br>1 µl; 0.048 mg/ml in Acetonitrile/Water 50/50 (v/v) |

| | | | | |
|---|---|---|---|---|
| 0-1 | min | A/B | | 98/2 |
| 1-4 | min | A/B | to | 2/98 |
| 4-5 | min | A/B | to | 98/2 |
| 5-6 | min | A/B | | 98/2 (v/v) |




**Area Percent Report - Sorted by Signal**

| Pk# | Retention Time | Area | Area % |
|---|---|---|---|
| 1 | 3.513 | 12.8628 | 100.00 |
| Totals | | **12.8628** | **100.00** |

For the calculation the system peaks were ignored. The content of the analyte was determined as the 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=3 |
| **Standard deviation** | < 0.01 % |

## IIb. Water Content

Method: Karl Fischer titration

**Results:**

| | |
|---|---|
| **Average** | 1.43 % |
| **Number of results** | n=3 |
| **Standard deviation** | 0.01 % |

## IIc. Residual Solvents

Method: $^{1}$H-NMR

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

## III. Final Result

| | |
|---|---|
| **Chromatographic purity (HPLC)** | 100.00 % |
| **Water content** | 1.43 % |
| **Residual solvents** | No significant amounts of residual solvents were detected (< 0.05 %) |
| **Assay (100 % method)[1]** | 98.57 % |

The assay is assessed to be 98.6 % ‘as is’

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

Release Date:

Luckenwalde, 2015-November-04

**Signed:**

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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