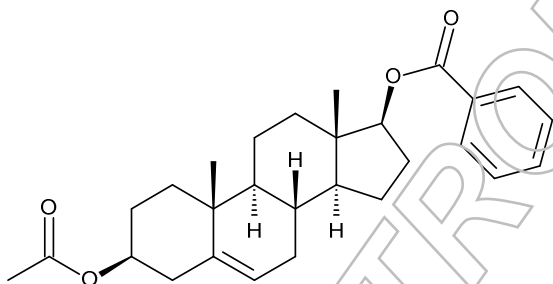




Certificate of Analysis

Reference Standard

Androst-5-ene-3 β ,17 β -diol 3-Acetate 17-Benzoate



Molecular Formula: C₂₈H₃₆O₄
Molecular Weight: 436.58
CAS Number: 5953-63-9

Catalogue Number: MM0323.20
Lot Number: 168866
Long-term Storage: 2 to 8 °C, dark
Appearance: white solid
Melting Point (DSC): 178 °C
Assay 'as is': 98.8 %

Date of shipment: **2018-July-02**

This certificate is valid for one year 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

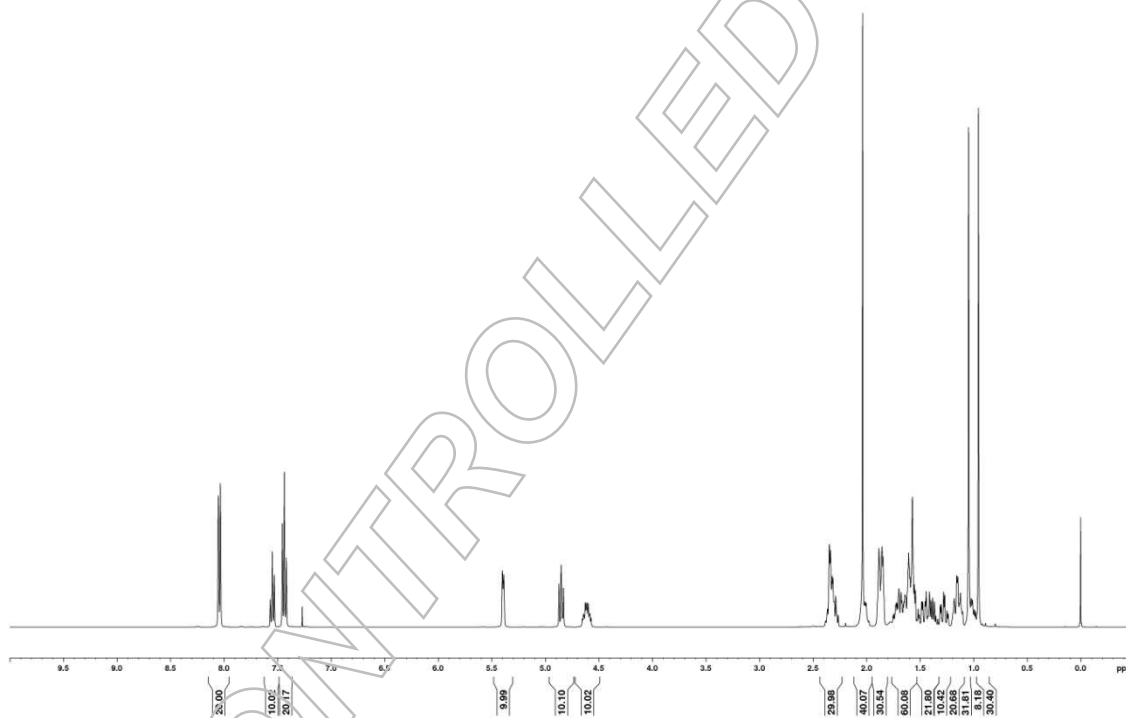


I. Identity

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

1a. ¹H-NMR Spectrum

Conditions: 400 MHz, CDCl₃

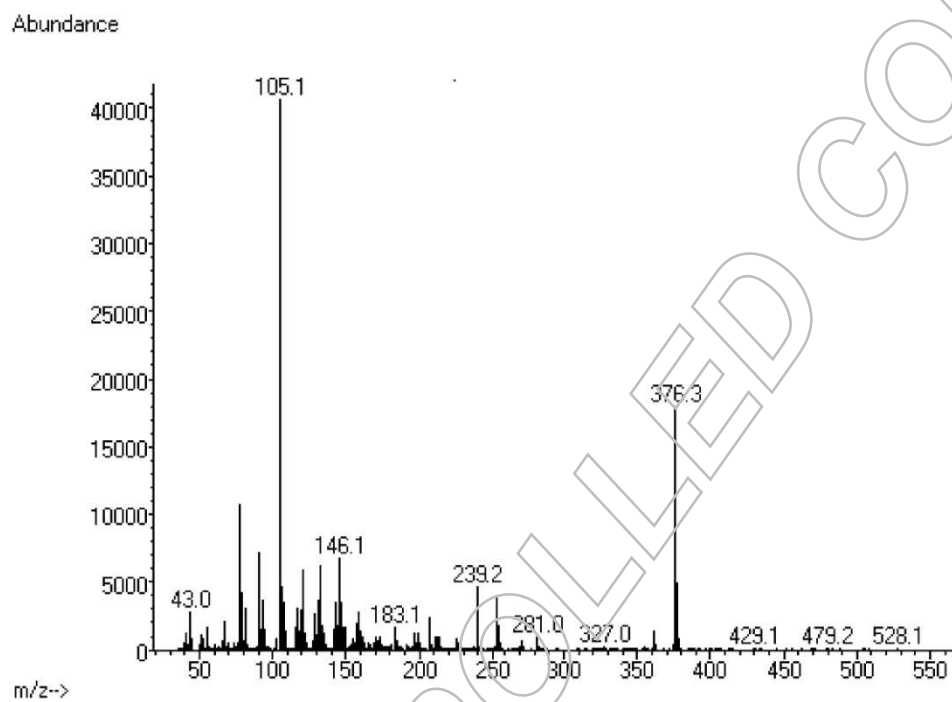


The structure is confirmed by the signals of the spectrum and their interpretation.



Ib. Mass Spectrum

Method: EI, 70eV, detector temperature: 280 °C

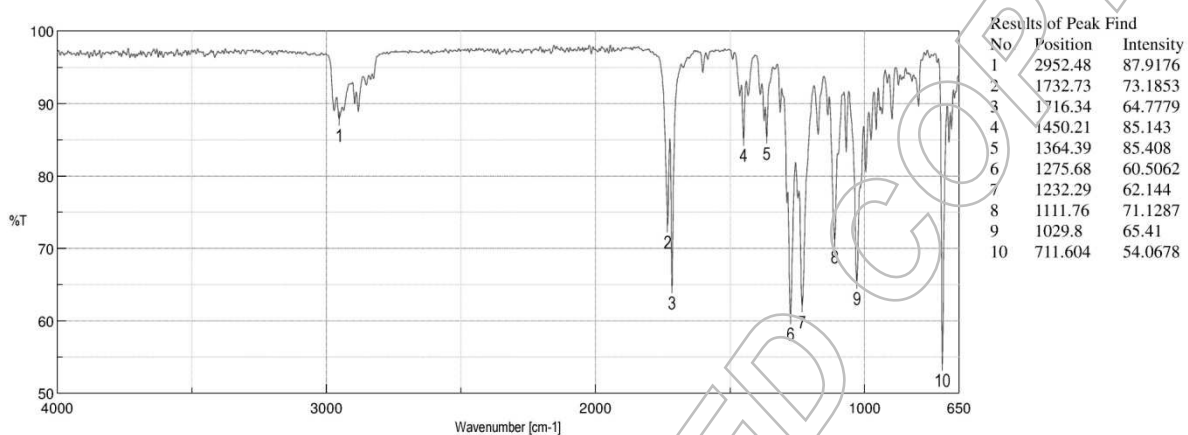


The signals of the mass spectrum and their interpretation are consistent with the structural formula.



Ic. IR Spectrum

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



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

II. Purity

Ila. High Performance Liquid Chromatography (HPLC)

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

HPLC Conditions:

Column:

Hypersil Gold C18
5 µm, 150 x 4.6 mm

Conditions:

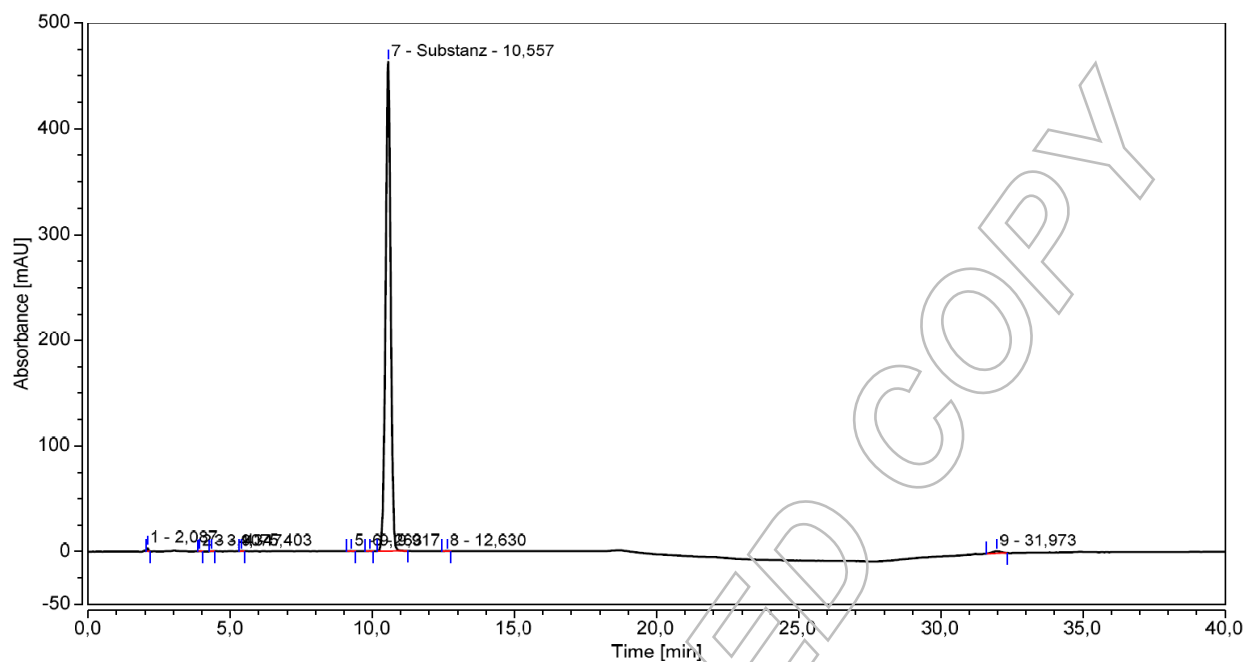
1.0 ml/min, 40 °C
0-15 min Water/Acetonitrile 20/80
15-19 min Water/Acetonitrile to 70/30
19-24 min Water/Acetonitrile 70/30
24-28 min Water/Acetonitrile to 20/80
28-40 min Water/Acetonitrile 20/80 (v/v);
0.1 % H₃PO₄

Detector:

DAD
230 nm

Injector:

Auto
1 µl; 0.708 mg/ml in
Methanol



Area Percent Report - Sorted by Signal

Pk #	Retention Time	Area	Area %
1	2.087	0.161	0.17
2	3.907	0.016	0.02
3	4.347	0.032	0.03
4	5.403	0.043	0.04
5	9.263	0.040	0.04
6	9.917	0.028	0.03
7	10.557	96.479	98.83
8	12.630	0.043	0.04
9	31.973	0.776	0.80
Totals		97.619	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 98.83 %
Number of results n=3
Standard deviation < 0.01 %



IIb. Water Content

Method: Karl Fischer titration

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

IIc. Residual Solvents

Method: ¹H-NMR

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

III. Final Result

Chromatographic purity (HPLC)	98.83 %
Water content	No significant amounts of water were detected (< 0.05 %).
Residual solvents	No significant amounts of residual solvents were detected (< 0.05 %).
Assay (100 % method)¹	98.83 %

The assay is assessed to be 98.8 % 'as is'

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

Release Date:

Luckenwalde, 2018-01-23

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.