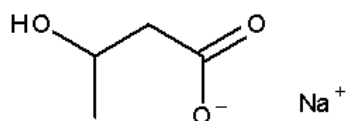




Certificate of Analysis

Reference Standard

Sodium 3-Hydroxybutyrate



Molecular Formula: $C_4H_7O_3 \cdot Na$
Molecular Weight: 126.09
CAS Number: 150-83-4

Catalogue Number: LGCFOR2565.00
Lot Number: 124807
Long-term Storage: 2 to 8 °C, dark
Appearance: white solid, very hygroscopic
Melting Point (DSC): 168 °C
Assay 'as is': 100.1 %

Date of shipment: **2017-January-25**

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.

LGC Quality | ISO 9001:2008
DQS 102448 QM08

LGC GmbH, Im Biotechnologiepark, TGZ II, D-14943 Luckenwalde, Germany

© 2012 LGC limited. All rights reserved. LGC Standards is part of the LGC Group.
LoGiCal is a registered trademark of LGC Standards GmbH

LoGiCal®
produced by LGC

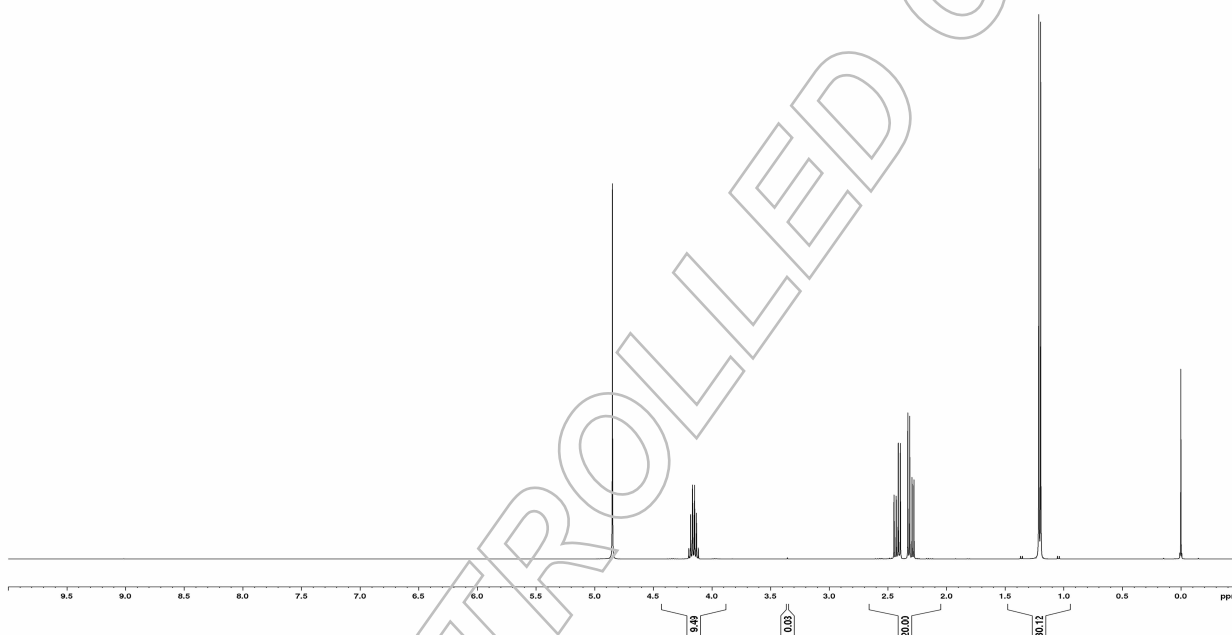


I. Identity

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

Ia. ^1H -NMR Spectrum

Conditions: 400 MHz, D_2O



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



Ib. Mass Spectrum

Method: HRMS; 2 kV ESI-; capillary temperature: 269 °C

7983 #212 RT: 0.94 AV: 1 NL: 1.46E6
T: FTMS - p ESI Full ms [80.00-1000.00]



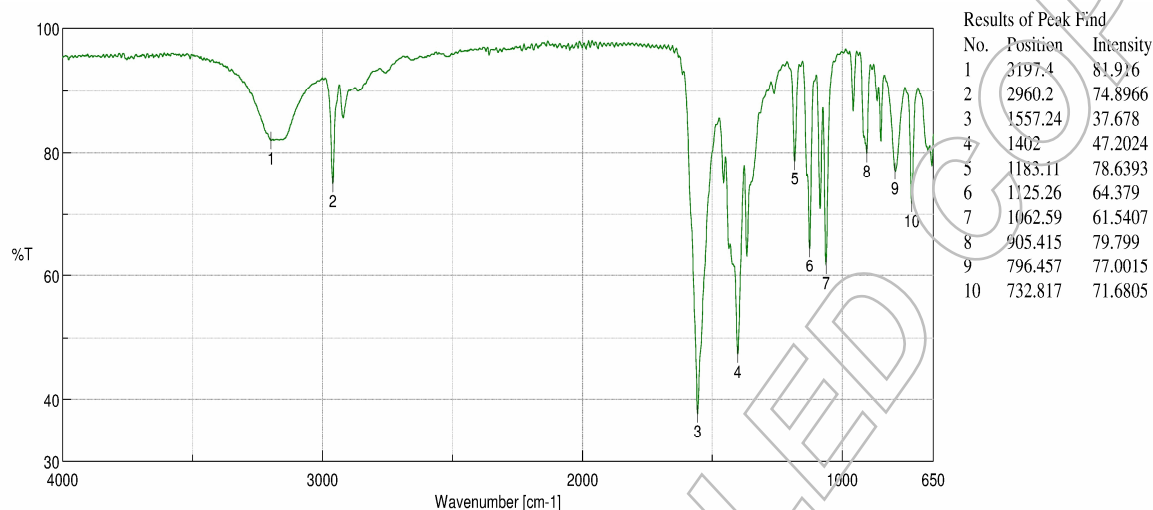
Theoretical value: 103.04006

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



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

II. Purity

IIa. Water Content

Method: Karl Fischer titration

Results:

Average 0.15 %

Number of results n=3

Standard deviation 0.02 %

IIb. Residual Solvents

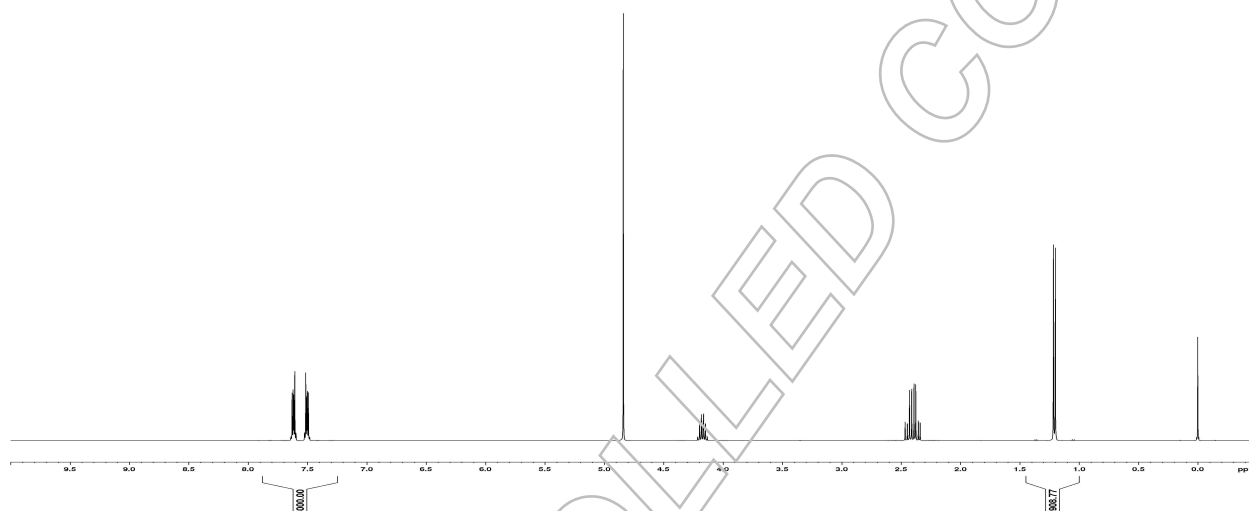
Method: ¹H-NMR

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



III. Assay by quantitative NMR spectroscopy

The assay of the reference substance was established by quantitative NMR spectroscopy using D₂O as solvent and with Potassium hydrogen phthalate (certified reference material, signal 7.25 - 7.88 ppm, 4 H) as internal standard.



Results:

Average	100.09 %
Number of results	n=3
Standard deviation	0.02 %



IV. Final Result

Water content	0.15 %
Residual solvents	No significant amounts of residual solvents were detected (< 0.05 %)
Assay	
Quantitative NMR spectroscopy	100.09 %

The assay is assessed to be 100.1 % 'as is'

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

Release Date:

Luckenwalde, 2016-December-19

Signed:

Dr. Andreas Sieg
Product Release