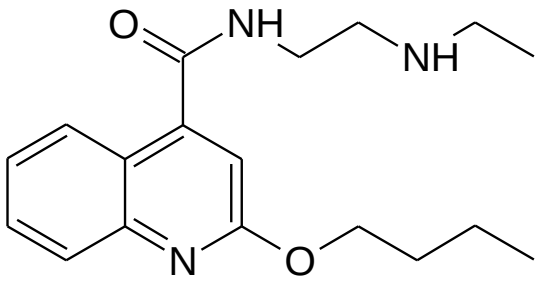
Our Formula. Your Success.

Reference Material Product Information Sheet

Epichem's Quality System conforms to ISO9001:2015 as certified by ECAAS Pty Ltd - Certification number 616061.



Name	2-butoxy-*N*-(2-(ethylamino)ethyl)quinoline-4-carboxamide
BP/EP Name	Not Listed.
USP Name	Not Listed.
Synonym(s)	*N*-desethylcinchocaine; *N*-desethyldibucaine
Epichem Item #	EPL-AA25 Batch 3
CAS #	87864-11-7
Molecular Formula	$C_{18}H_{25}N_3O_2$
Molecular Weight	315.42 g/mol
Appearance	White powder
Melting Point	102.0-114.4°C (decomposition)
Combustion Analysis	Required (%): C:68.5; H:8.0; N:13.3. Found (%): C:67.7; H:7.9; N:12.9.
Purity*	97.9%
Date of Manufacture	2 January 2009
Storage Requirements	Protect from heat, light and moisture.
Special Precautions	**This compound is for laboratory use only. Its toxicological properties may not have been fully established. It should be handled only by suitably qualified personnel.**
Intended Use	This compound is suitable for the identification of impurities and degradants in pharmaceutical materials. The purity assay is considered as relative contribution.
Date of Shipment	TBA This certificate is valid for one year from the date of shipment provided the substance is stored under the recommended conditions.
Retest Date	TBA (Proper Storage and Handling Required)

** NATA accreditation does not cover the performance of this service*

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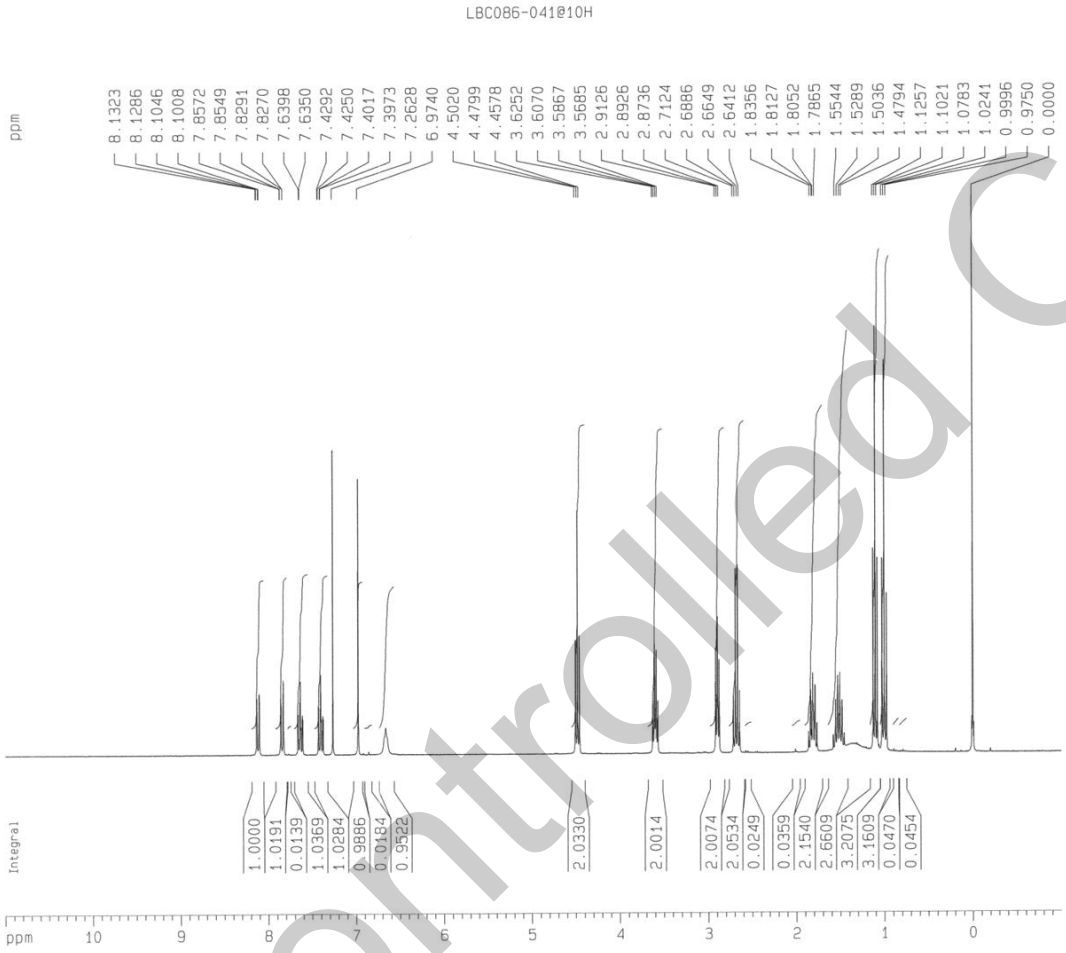
I. Identity

The identity of this product was established using the following analyses:

Ia. [1]HNMR Spectrum

Conditions: 300 MHz, $CDCl_3$

[1]HNMR spectrum consistent with chemical structure.

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Current Data Parameters
NAME      LBC086-041@10H
EXPNO               30
PROCNO               1

F2 - Acquisition Parameters
Date_         20081229
Time             16.09
INSTRUM          spect
PROBHD   5 mm BBO BB/2H
PULPROG           zg30
TD               65536
SOLVENT           CDCl3
NS                  16
DS                   2
SWH           6172.839 Hz
FIDRES        0.094190 Hz
AQ            5.3084660 sec
RG               322.5
DW              81.000 usec
DE              20.00 usec
TE              683.2 K
D1           1.00000000 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                1H
P1              11.50 usec
PL1             -6.00 dB
SF01        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300054 MHz
WDW                EM
SSB                 0
LB               0.30 Hz
GB                  0
PC               1.00

1D NMR plot parameters
CX               20.00 cm
CY               18.04 cm
F1P             11.000 ppm
F1             3301.43 Hz
F2P             -1.000 ppm
F2            -300.13 Hz
PPMCM         0.60000 ppm/cm
HZCM        180.07800 Hz/cm
```


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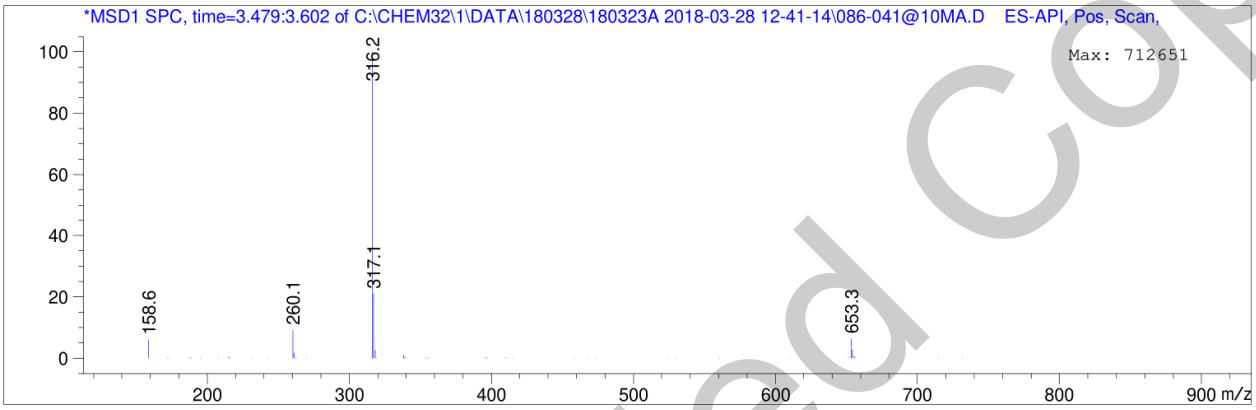
Ib. Mass Spectrum

The mass spectrum of this material was analysed by Liquid Chromatography Mass Spectroscopy (LCMS) using in-house EM005.WI08.

Method: 5% to 100% ACN in water gradient (+0.1% formic acid)

Zorbax Eclipse XDB-C8, 3.0 x 100 mm, 3.5 micron

Retention Time (MS)	MS Area	Mol. Weight or Ion
3.533	14714491	317.15 I 316.20 I



Theoretical values: 316.2 $[M+H]^+$.

The signal of the Mass Spectrum is consistent with the theoretical value and its interpretation is consistent with the structural formula.

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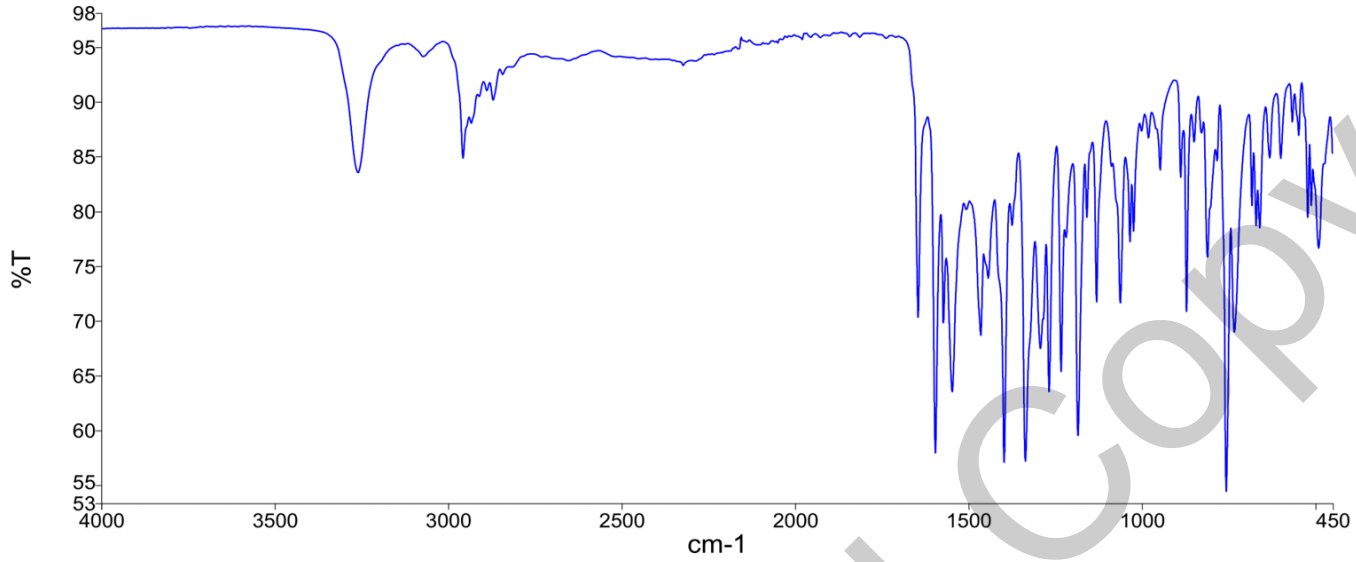
Ic. IR Spectrum

The infra-red spectrum of this material was analysed by Fourier-Transform Infrared Spectroscopy (FTIR) using in-house EM005.WI09.



The interpretation of the signals of the Fourier-Transform Infrared Spectrum is consistent with the structural formula.

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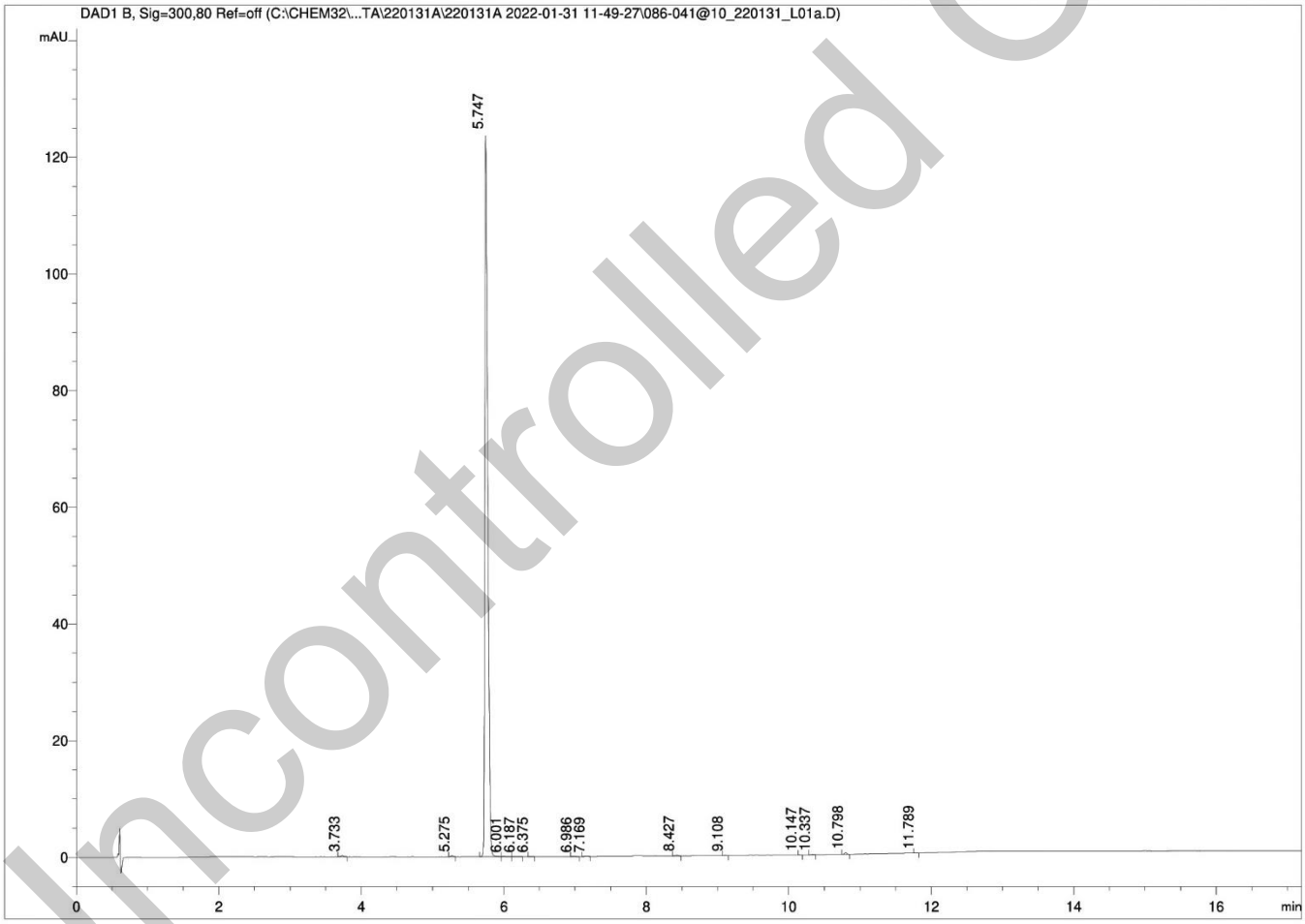
II. Purity

The purity of this material was analysed by high performance liquid chromatography (HPLC) using in-house EM005.WI07.

HPLC Conditions:

Column	Conditions				Detector	Injector
Agilent Poroshell 120 EC-C18 4.6 x 50mm 2.7 micron	25ºC				DAD 300nm	Auto 1.0 µL 0.65 mg/mL in 100% acetonitrile (+0.1% TFA)
	Time (min)	% Line A (Water + 0.1% (v/v) TFA)	% Line B (Acetonitrile + 0.1% (v/v) TFA)	Flow rate (mL/min)		
	0.00	85	15	1.0		
	6.00	55	45	1.0		
	11.00	5	95	1.0		
	16.00	5	95	1.0		
	17.00	85	15	1.0		
	20.00	85	15	1.0		



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Area Percent Report – Sorted by Signal

Peak Number	Retention Time (rounded)	Area	Area % (rounded)
1	3.73	0.40	0.11
2	5.27	0.33	0.09
3	5.75	362.14	99.30
4	6.00	0.18	0.05
5	6.19	0.09	0.02
6	6.38	0.05	0.01
7	6.99	0.10	0.03
8	7.17	0.09	0.02
9	8.43	0.36	0.10
10	9.11	0.11	0.03
11	10.15	0.05	0.01
12	10.34	0.13	0.04
13	10.80	0.60	0.17
14	11.79	0.06	0.02
Totals			100 (rounded)

For the calculation the system peaks were ignored. The content of the analyte was determined as a ratio of the peak area of the analyte and the cumulative areas of the purities, added up to 100%.

Results:

Average 99.3% (average of 10 duplicate runs)

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III. Water Content

Method: Karl-Fischer titration using in-house EM005.WI04.
Results:
Average 1.5%

IV. Ash Content

Method: Combustion adjuvant added
Result:
Contains <0.1% ash.

V. Residual Solvents

Method: ^{1}HNMR
Result:
No significant impurities detected by ^{1}H NMR analysis.

VI. Final Result

Chromatographic purity (HPLC)	99.3%
Water content	1.5%
Ash content	<0.1%
Residual solvents	<0.1%
Purity*	97.8%

This purity is assessed to be 97.8%.

Product Reviewed By:

James Rixson, PhD
Head of Production

Product Released By:

Carol Worth, PhD
Quality Manager

Release Date: 16 June 2023

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The calculation of the purity follows the formula:

$$\text{Purity}(\%) = \frac{((\text{Chromatographicpurity[HPLC]})x(100 - (\text{watercontent} + \text{ashcontent} + \text{volatilecontents})))}{100}$$

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