

BDG SYNTHESIS

Certificate of Analysis

BDG Synthesis certifies that this reference material meets or exceeds the specifications stated in this data sheet.

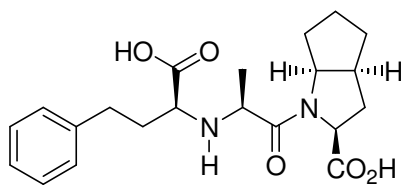
Barry Dent

Barry R. Dent, PhD, Director
26 March 2008

Name: Ramiprilat

CAS Number: 87269-97-4

Structure:



Molecular Weight: $C_{21}H_{28}N_2O_5 = 388.45$

Lot Number: BDG 2655.4

Appearance: White powder

Corrected Purity: 99.6 % (HPLC) – 1.5 % (water) = 98.1 %

Expiry Date: 26 March 2009

Storage and Handling:

Temperature: ambient laboratory temperature; may be refrigerated.

Humidity: not believed to be hygroscopic; may be handled in normal laboratory atmosphere.

Light: protect from strong sunlight.

Caution: Only experienced laboratory personnel should handle the material.

Identity and Purity:

Source of Material

The material was made by an unambiguous synthetic route, using literature procedures where possible; starting materials were purchased from reputable sources and all intermediates were checked for identity by NMR.

Proton NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available. The complexity of the spectrum indicates two conformers of the product are present in solution.

Residual solvents: no residual solvents are observed.

Impurities: no significant impurities are evident in the spectrum.

Carbon-13 NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available. The majority of signals are duplicated indicating that two conformers of the product are present in solution.

High-resolution mass spectrum (FAB+): found m/z 389.2074. $C_{21}H_{29}N_2O_5$ $[M+H]^+$ requires m/z 389.2076. The deviation of 0.7 ppm is within normally accepted limits for the establishment of identity by HRMS.

HPLC: A broad, symmetrical peak is observed (99.6 area %). The broad peak in the baseline is present in the solvent blank. Note: in the absence of reference materials for preparing calibration curves, it is assumed that all peaks have the same detector response. Where possible, the conditions of analysis follow a pharmacopeial or literature method, or have been adapted from same.

Elemental Analysis:	Found:	C 63.16, H 7.18, N 7.03 %
$C_{21}H_{28}N_2O_5 \cdot 0.5 H_2O$	requires:	C 63.46, H 7.35, N 7.05 %
$C_{21}H_{28}N_2O_5$	requires:	C 64.93, H 7.26, N 7.21 %

The elemental analyses fall somewhat outside those expected for anhydrous material; the presence of water is reasonably expected from the method of purification and/or the type of material, and the "best-fit" hydrated molecular formula is given.

Karl Fischer Analysis:	Found H_2O	1.5 %
$C_{21}H_{28}N_2O_5 \cdot 0.5 H_2O$	requires H_2O	2.3 %

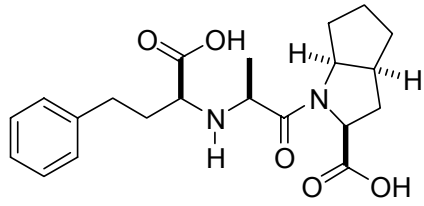
Of necessity, only a small sample could be used and only a single or duplicate analysis performed. We are unable to state what the errors in the reported water content are, but recommend that the result be used, as the best available, when determining corrected purity.

This material has been made to order on a small scale, and sample size limits the extent of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-produced materials. Such materials often contain higher levels of residual solvents and/or water, and we urge you to use the corrected purity where needed rather than the raw HPLC purity. This compound is intended for use as an analytical reference material and it is not for human administration.

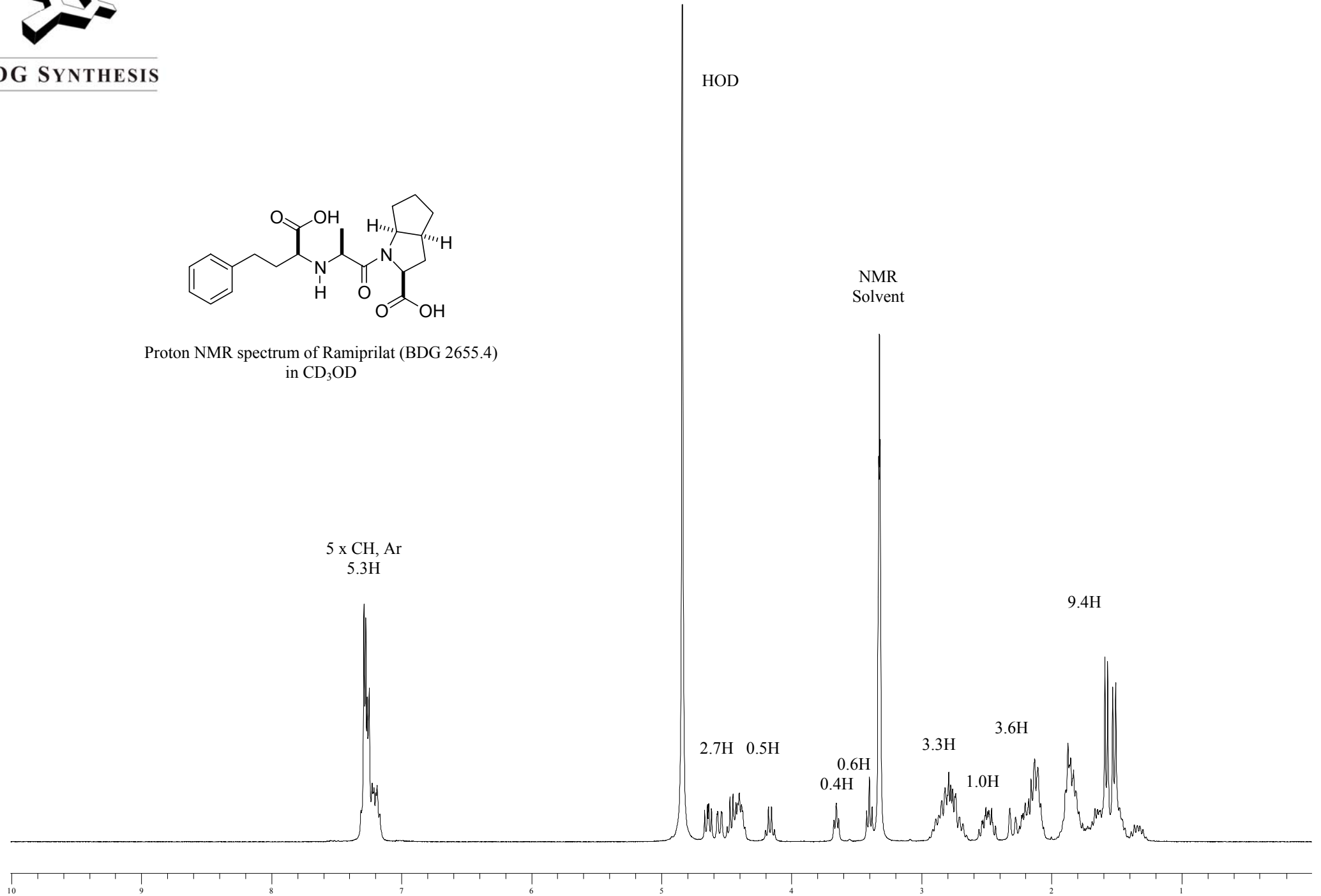
The expiry date is assigned from experience gained with the material in the laboratory and/or on storage. It is not possible to perform formal storage stability studies because of the small amount of material available.



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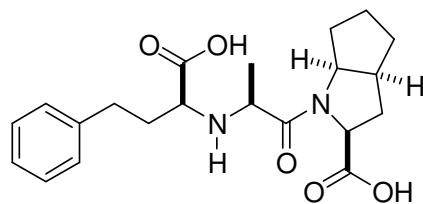


Proton NMR spectrum of Ramiprilat (BDG 2655.4)
in CD₃OD

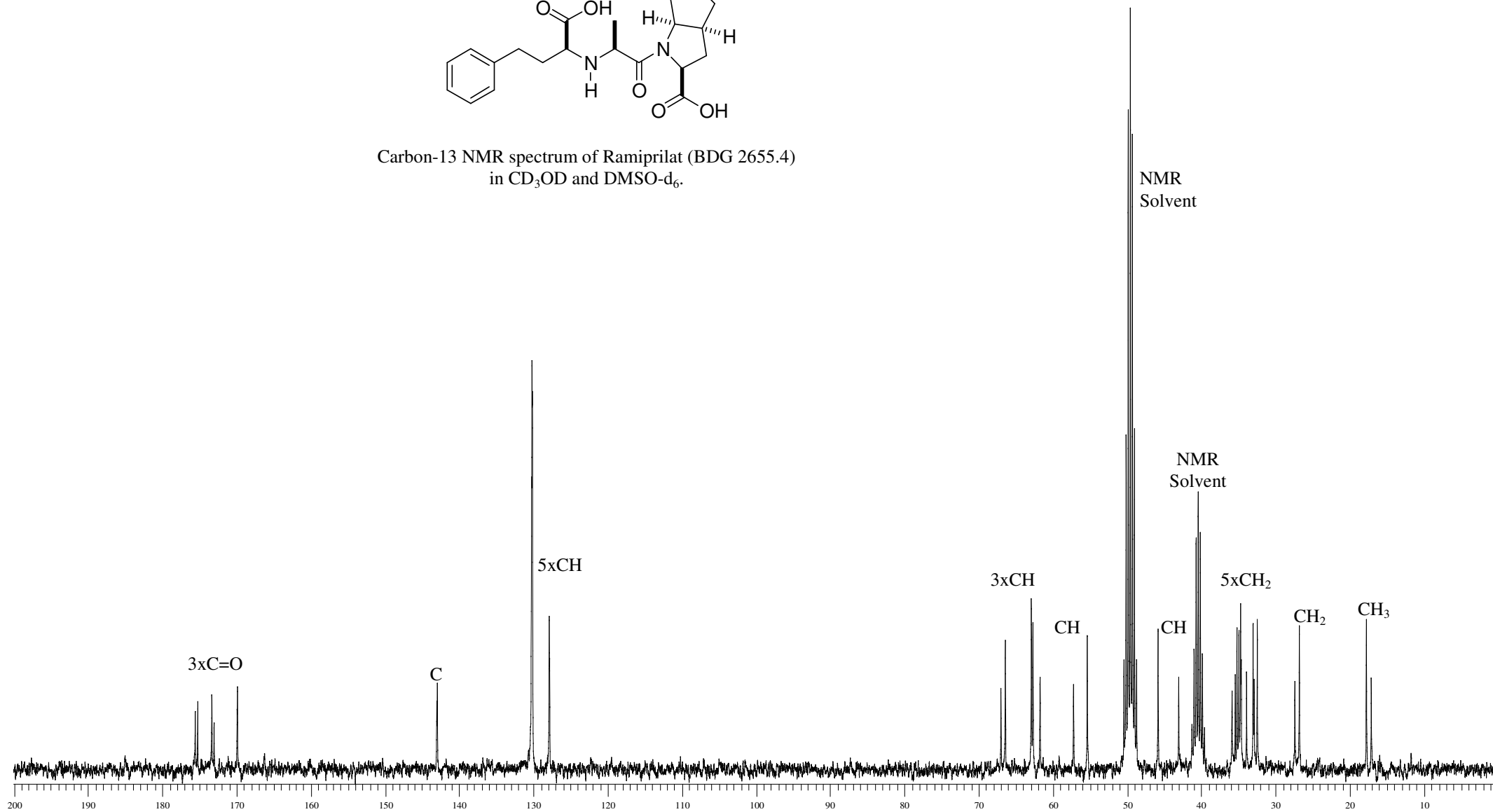




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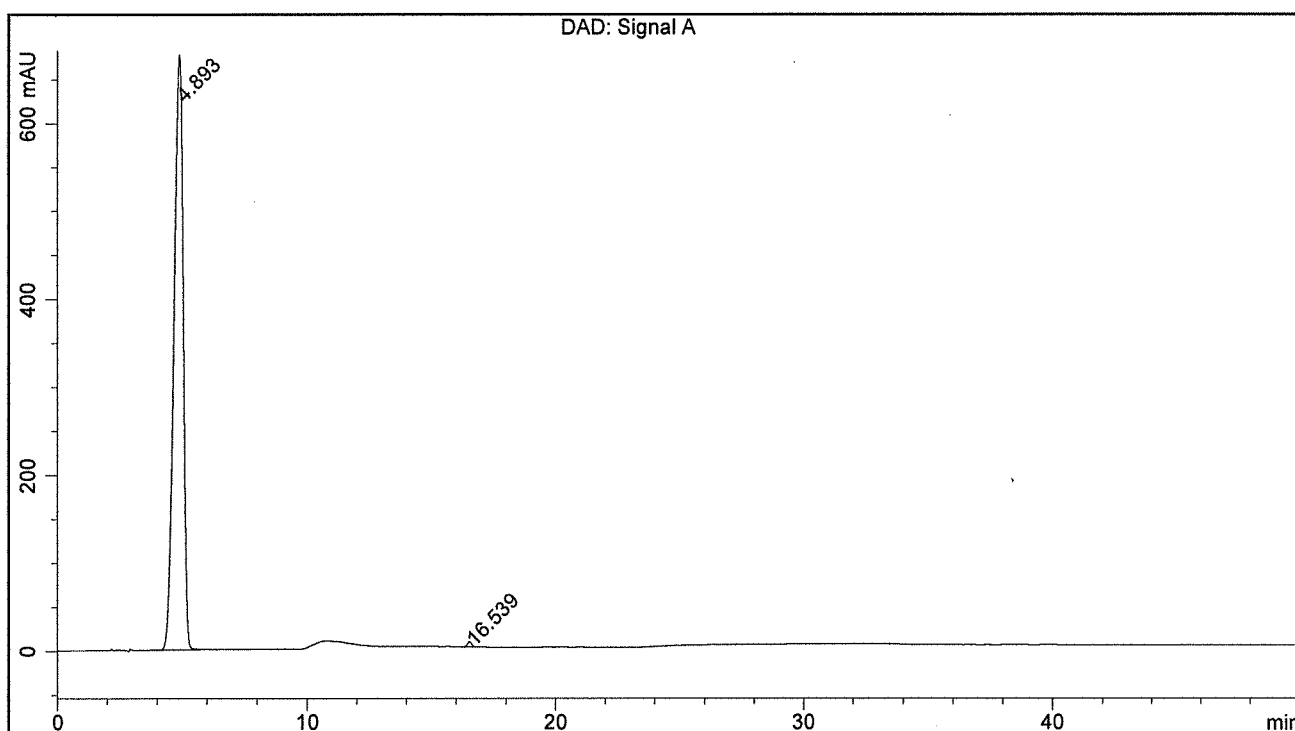
Carbon-13 NMR spectrum of Ramiprilat (BDG 2655.4)
in CD₃OD and DMSO-d₆.



BDG - Analysis of Ramiprilat

Column : Phenomenex Luna C18 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 4 x 3 mm
 Mobile Phase A : 80:20 0.2% Sodium Perchlorate 0.05% Triethylamine pH=3.6 : Acetonitrile
 Mobile Phase B : 30:70 0.2% Sodium Perchlorate 0.05% Triethylamine pH=2.6 : Acetonitrile
 Gradient (A:B) : T0=90:10, T6=90:10, T7=75:25, T20=65:35, T30=25:75, T50=25:75, T55=90:10, T60=90:10
 Flow Rate : 1.0 mL/min
 Sample Solvent : Mobile Phase A
 Column Temperature : 60C
 Injection Volume : 10 uL
 Detection : UV at 210 nm

Sample Name	BDG 2655.4	Instrument	AnalyticalLC01
Acquisition	26/03/2008, 15:02:36	Method (rev.)	LC10241a (4)
Sequence	BDG_26Mar2008b - Reprocessed	Vial Position	2
Operator	solvation010\cerityadmin	Injection	1 of 1



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	4.89 min	676.2396	17266.0165	0.4059 min	99.589 %
2	16.54 min	5.9114	71.1918	0.1865 min	0.411 %